

ROADMAP TO THE REPORT:

WestEd Evaluation of MIND Research Institute's ST Math Program in California



[This study](#) looked at grade-level average California Standards Test (CST) Math scores at all schools in California having grades that used the ST Math program for the first time in 2010-11, and compared them to a matched set of other schools in the state that did not use ST Math. This roadmap points out key findings, report features and references pages from the full report for more information.

Who was included in the study?

This Roadmap focuses on the results found at the 129 California elementary schools that fully implemented ST Math for the first time during the 2010-11 school year, meaning at least 85% of the students in that grade were enrolled in the ST Math program and on average completed at least 50% of the program. Because the intention was to evaluate the impact of ST Math at schools that were not already high-performing, the study excluded grades in the top 15% of statewide math performance. The grades using ST Math included more than 19,980 second through fifth grade students in 209 grades. The demographics were on average 72% low income, 66% Latino and 6% African American.

What data was used?

Thanks to implementation of ST Math across all classrooms in each grade, the study used grade-average 2010 and 2011 California Standards Test (CST) Math scores and proficiency level percentages reported by the California Department of Education.

What are the main take-aways?

The study found the proportion of students who scored either Proficient or Advanced (i.e., above the No Child Left Behind requirement) after fully implementing ST Math to be, on average, 6.38 percentage points higher than students in the comparison grades, a 0.47 effect size* (p. 12, Exhibit 6). Additionally, the modeling predicted that grades fully implementing ST Math scored Advanced on the CST math at a rate that was, on average, 5.58 percentage points higher than in comparison grades that were not provided with ST Math. Here, ST Math's effect size was 0.40.* In a third measurement, the impact of ST Math on scale scores was evaluated, and the effect size was 0.42,* which means that a school at the 50th percentile statewide would move up 16 percentile points in statewide ranking after implementing ST Math for one year.

**These effect sizes are well beyond the federal What Works Clearinghouse (WWC) criteria of 0.25 for "substantively important" effect. Effect size is the difference between the mean values of two sets of data — one treatment and one control — and is measured in units of standard deviation. Each of these followed rigorous WWC standards for quasi-experimental match validity and met the rigorous WWC specifications for statistical significance, per the WWC Procedures and Standards Handbook, Version 3.*

MIND Research Institute
A neuroscience and education social benefit organization

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Did the study look at individual grade levels?

In addition to aggregating results across all grade-levels, second through fifth, the study also looked at individual grade levels and reported out effect sizes on scale scores ranging from 0.28 to 0.56, at p-values from .001 to .068.

How were the comparison schools chosen?

The comparison grades were randomly selected schools that had not used ST Math prior to or during the 2010-11 school year but were matched in demographics and prior math performance. Comparison schools were selected from the same districts which were using ST Math, in order ensure that they were geographically similar to the ST Math schools. Mahalanobis distance matching was used to identify comparison grades similar in math performance and demographics (p. 6), and the comparison groups' selection process meets the rigorous What Works Clearinghouse standards. (Appendix B, p.19).

What kinds of analyses were done for the study?

This report performed Intent-to-Treat (ITT) as well as Treatment-on-Treated (ToT) analyses:

- ITT, considered a more conservative estimate of impact, looked at differences between all grades that were provided ST Math, regardless of the extent to which they implemented the program (p. 3).
- ToT analyses included only grades that implemented ST Math to a minimally adequate level of coverage of math concepts. That is, at least 85% of students in each grade used the program and covered at least 50% of the material.

Both analysis methods produced consistently favorable and significant results, with the ToT analysis showing as expected, notably higher effect sizes (p. 8, Exhibit 3; p. 12, Exhibit 6).

What outcomes did the study examine?

- Grade-level 2011 CST-Math mean scale scores. (0.42 effect size for grades fully implementing ST Math.)
- The proportion of students in each grade who were Advanced in math. (Effect size 0.40 for grades fully implementing ST Math; equivalent to ST Math students scoring 5.58 percentage points higher, on average, than students in comparison grades.)
- The proportion of students in each grade who were either Proficient or Advanced in math. (Effect size 0.47 for grades fully implementing ST Math; equivalent to ST Math students scoring 6.32 percentage points higher, on average, than students in comparison grades.)

The full report, titled "Evaluation of the MIND Research Institute's Spatial-Temporal Math (ST Math) Program in California" (WestEd, October 2014), can be found at <http://hubs.ly/y0hm2j0>.

Beyond the Report -- Absolute Growth Figures

Growth in math proficiency from baseline (2009-10) for ST Math schools compared to similar schools.

Increase in Percent of Students on California Standards Test

