

Proven Practices

Examining K-3 Math Implementation and Impact across Implementation Contexts



Math Corps is an AmeriCorps-powered tutoring program that provides K-8 grade students up to 100 min of weekly tutoring in small groups. Math Corps is curriculum-independent, focusing on high-value foundational skills that help students work with whole and rational numbers (National Mathematics Advisory Panel, 2008). The program uses data for instructional decision-making and provides multiple levels of coaching to tutors. The impact of Math Corps in grades 4-8 is supported by two randomized controlled trials, both of which provide rigorous evidence for its impact on students.

The Project

This research brief outlines the results of an evaluation of K-3 Math Corps implementation and impact in 30 schools across six states, predominately New York, Mississippi, and California (79%). Analyses included schools new to the program and those who had experienced two or more years of K-3 Math Corps. The intent of the evaluation was to better understand the impact of tutoring with K-3 students in particular, and to provide insight on the implementation experiences of tutors and school partners.

Why It Matters

K-3 Math Corps was designed to accelerate math learning for students who need added support. The primary instructional strategies of K-3 Math Corps are all evidence-based (see Table 1), but research is needed to determine if the overarching K-3 Math Corps program—its instructional strategies, its use of data, and its use of AmeriCorps-based tutors—produces a positive impact on student learning across different implementation contexts. The current project is a preliminary examination of those elements of the program.

Table 1. Instructional Strategies of Math Corps

Concrete and Representational Scaffolds	Explicit and Systematic Instruction	Cognitive Strategy Instruction
Explicit procedures for developing students' conceptual understanding using representations of a given math concept, such as 3D manipulatives, 2D illustrations, and symbols.	Clear, direct teaching of concepts and procedures including modeling, guided practice, and independent practice with immediate feedback.	Develops students' problem solving skills using a 7-step process for engaging and solving various applied word problems.
Carbonneau, K. J., Marley, S. C., & Selig, J. P. (2013). A meta-analysis of the efficacy of teaching mathematics with concrete manipulatives. <i>Journal of educational psychology, 105</i> (2), 380.	Pelligrini, M., Lake, C., Neitzel, A., & Slavin, R. E. (2021). Effective programs in elementary mathematics: A meta-analysis. <i>AERA Open, 7</i> (1), 1-29.	Zhang, D., & Xin, Y. P. (2012). A follow-up meta-analysis for word-problem-solving interventions for students with mathematics difficulties. <i>The Journal of educational research, 105</i> (5), 303-318.



Methodology Overview

The evaluation took place in 30 schools across six states, focusing predominately in New York, Mississippi, and California (79% of students served). The proportion of students receiving tutoring increased across grades (18% in kindergarten to 33% in third grade), indicating that schools chose to focus tutor support more heavily on student needs in later elementary. Students in the included schools differed somewhat from the national Math Corps population, with substantially more students of color (68% v. 37% in full program population). The evaluation adopted a multi-source/multi-method approach to evaluating the overall implementation and impact. In addition to describing different features of implementation and impact, the evaluators examined a variety of student and school-level characteristics that might be associated with implementation and/or impact.

Key Findings

Promising Patterns of Program Impact. Students served by Math Corps tutors demonstrated statistically significant growth on both Mathway (+30-42% points) and i-Ready (+24-34). These gains were meaningful—students increased their proximity to grade level expectations based on changes in their Mathway scores and i-Ready scores. For example, between 38% and 66% of students were more than one grade-level behind at the outset of the year based on i-Ready benchmarks but only 12% to 25% were that far behind in the spring.

Tutors View Math Corps as Feasible and Impactful. In a survey distributed to all tutors, over 90% found the intervention implementation procedures to be “very easy” or “somewhat easy.” Among the three elements considered in regard to implementation, members found the delivery of intervention scripts and the procedures for advancing from one unit to the next to be the most difficult. In regard to impact, 98% of tutors reported that student skills increased across as a result of tutoring.

Implementation Insights. On average, students received 48 tutoring sessions across 16-17 weeks of tutoring, attending an average of 64% of scheduled sessions. 23% of students met program exit criteria. ***There was a significant association between the percentage of tutoring sessions attended and performance on i-Ready, with each 10% increase in attendance associated with a 5.5-point increase on spring i-Ready scores.***

Main Takeaways

1. Similar to its implementation in later grades, Math Corps tutoring in K-3 is associated with meaningful gains in student skill across a variety of different school contexts and student needs. The impact of tutoring was largest when students received at least 16 weeks of support with at least 65% of scheduled tutoring sessions attended.
2. Tutors and program staff view the program as feasible and impactful, but also highlighted areas for continuous improvement that included:
 - a. Revisions to tutoring materials to reduce length and emphasize play-based opportunities to practice.
 - b. Strengthening program training with exemplar tutoring videos and an emphasis on how to best prepare for scheduled tutoring sessions.
 - c. Additional monitoring and support to ensure scheduled tutoring sessions are delivered, recognizing that the *consistency* of tutoring was a major lever in program impact.

Dosage Matters

24% of tutored students exceeded i-Ready “stretch growth” goals, but **33% of students tutored for 16 weeks with at least 65% attendance exceeded those same goals.**