

RESEARCH UPDATE

San Marcos Unified School District San Diego County, CA

Economically Disadvantaged Students and English Learners Outperformed Peers After Using *Do The Math*

PROFILE

District: Carrillo Elementary School, San Marcos Unified School District, San Diego County, CA

Evaluation Period: December 2010–June 2011

Grade: 3

Model: *Do The Math* Modules Multiplication A and Division A

Assessments: *Do The Math* pre- and post-module
Math Inventory (MI)
California Standards Test (CST) Mathematics

SCHOOL CHARACTERISTICS

Carrillo Elementary School (CES) is a K–5 public school in the San Marcos Unified School District in California, enrolling 922 students. The majority of students at CES are Caucasian (64%) or Hispanic (16%). Seventeen percent of students are eligible for free or reduced price lunches.

OVERVIEW

Implementation

Third-grade teachers at CES have used the Multiplication A and Division A modules of *Do The Math* each year since the 2008–2009 school year. Two of the five teachers were involved in the development of the *Do The Math* materials.

Teachers reported using *Do The Math* for an average of 60 minutes a day. *Do The Math* is designed to be used in 30-minute increments as supplementary instruction for students who need math intervention. The teachers at CES used *Do The Math* as their primary curricular materials for multiplication and division topics and had approximately 30 students in each class. The size of the classes and use as a primary curriculum account for the longer instructional

times. Additionally, teachers revisited the games and activities associated with the lessons after completing the modules. Students were allowed to choose games as free choice activities, and the games were periodically used as whole class activities.

Participants

The sample described in this analysis is comprised of 145 third-grade students in five classes at CES from the 2010–2011 school year. According to 2011 California STAR test results, 64% of these third graders are white, 11% are Asian, 11% are Hispanic, and 4.5% are African American. Economically disadvantaged students made up 13% of the 2011 third-grade class, 9% were English learners, and 6.5% were identified as students with disabilities.

Measures

Module Tests

Each *Do The Math* module includes a 20-question pretest and a 20-question posttest. Students completed these tests at the beginning and end of each 30-lesson module.

Math Inventory (MI)

MI is a computer-adaptive assessment of students' readiness for mathematics instruction. MI was administered in January 2011, at the onset of *Do The Math* usage, and again between May and early June, after students completed the *Do The Math* modules.

California Standards Test (CST) Mathematics

The CST Mathematics test is a standardized assessment of 65 multiple-choice questions, drawn from five strands/reporting clusters.

RESULTS

Module Tests

For the 145 students, who completed both the pre- and post-module assessments for Multiplication A, analysis showed an average improvement of 22 percentage points. The 134 students who completed both the Division A pre- and post-module assessments demonstrated an improvement of 33 percentage points (Graph 1).

Math Inventory (MI)

Fifty-one third-grade students from two classes completed MI administrations prior to and after completing the two *Do The Math* modules. The average score increase was 147 Quantile® (Q), from 421Q to 568Q. On average, students' posttest performance fell in the advanced performance level for third grade. While expected annual growth on MI for a third grader is 150Q, the third-grade students at CES saw similar growth in just one semester.

CST Mathematics

Ninety percent of third-grade students at CES achieved a proficient or above result on the 2011 CST Mathematics. Additional analysis of the CST Mathematics results included the examination of economically disadvantaged students' and English learners' scores at CES and at a similar school in the district that did not implement *Do The Math*. Table 1

displays CES students' demographic characteristics and those of students at the comparison school, referred to as School A.

The Grade 3 economically disadvantaged students and English Learners at CES outperformed their peers at the comparison school in the district. As seen in Graph 2, a substantially larger percentage of economically disadvantaged students at CES scored in the proficient or above level on the 2011 CST Mathematics exam than did the economically disadvantaged students at the comparison school. Also, the CST Mathematics results indicate a larger percentage of the English learners at CES were in the proficient and above levels than at the comparison school.

The CST Mathematics performance of English learners and economically disadvantaged students at CES improved since Grade 3 teachers began using *Do The Math* in 2008. Before Grade 3 CES teachers began using *Do The Math*, 59% of English learners and 67% of economically disadvantaged students received a score of proficient or above on the CST Mathematics exam. After *Do The Math*, 79% of English Learners and 85% of economically disadvantaged students received a score of proficient or above on the 2011 third-grade CST Mathematics.

Graph 1.

Carrillo Elementary School *Do The Math* Grade 3 Students, Average Pre- and Post-module Assessment Results.

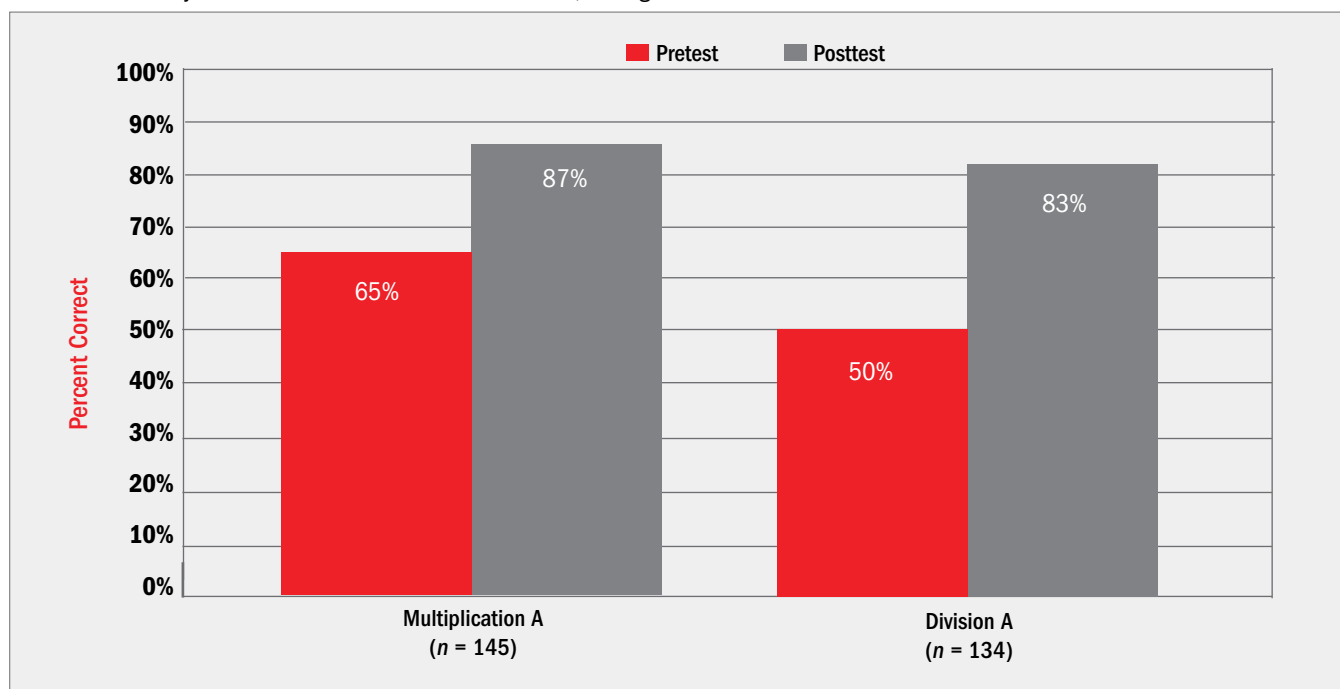


Table 1.

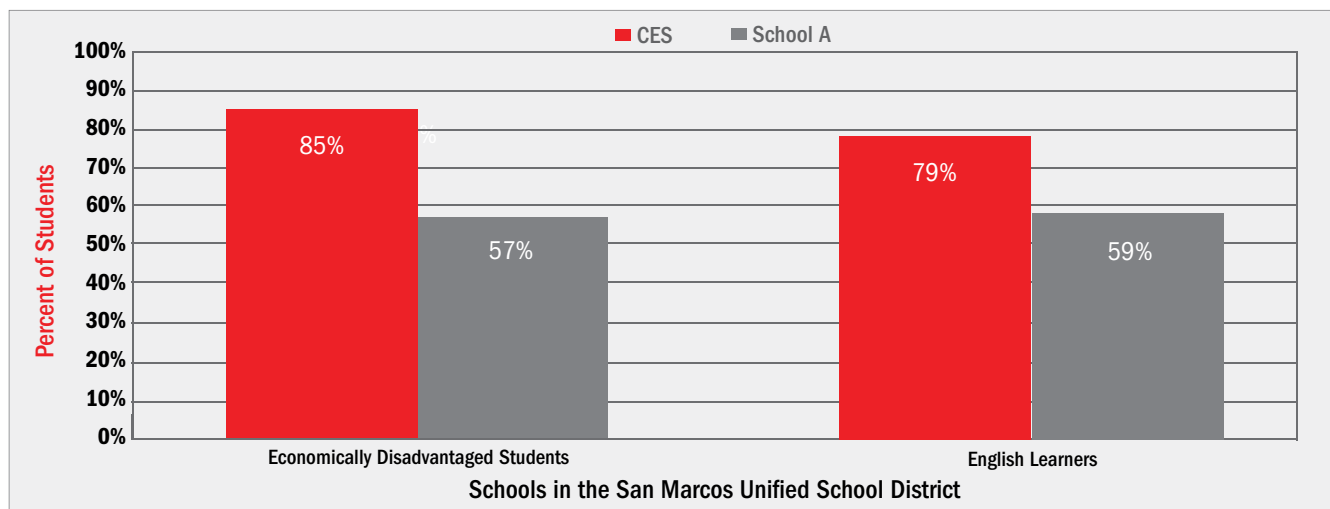
Comparison of Students' Demographic Characteristics at CES and a Similar School in the San Marcos Unified School District.

Demographic Categories	CES (922 students)	School A (1,099 students)
Eligible for free or reduced price lunches*	17%	13%
ELL **	8%	7%
Caucasian*	64%	71%
Hispanic*	16%	15%
Asian/Pacific Islander*	14%	9%
African American*	4%	2%

*NCES (2009–2010) **California Department of Education (2008–2009)

Graph 2.

San Marcos USD Grade 3 economically disadvantaged students and English Learners, 2011 CST Mathematics results proficient or above.



CONCLUSION

Third-grade economically disadvantaged students and English Learners at CES outperformed their peers at the district comparison school on the CST Mathematics exam. These improvements in performance on the CST Mathematics exam coincide with the implementation of *Do The Math* at CES.

Students at CES improved an average of 147Q, ending the school year in the advanced performance range. Further, it should be noted MI assesses more than just multiplication and division. Therefore, this growth indicates developing a strong understanding of multiplicative reasoning may positively impact students' performance on other assessed mathematics topics.

In addition to these improvements in student achievement, noteworthy comments were collected during an interview with the lead teacher. The teacher offered that students did not memorize facts but instead developed a deep conceptual understanding of multiplicative reasoning. The teacher found that students were engaged with the curriculum and felt empowered as they came to understand difficult material. The development of conceptual understanding and confidence to learn difficult topics represent two of the most important attributes signaling future success both in and out of school.

RESEARCH UPDATE



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