

*The effects of an online collaborative elementary math program using team-based games to improve student math achievement, attitude and motivation.*

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**Abstract**

The U.S. mathematics education system is failing to produce enough technically skilled workers for it to stay globally competitive. One of the key problems is that U.S. students are not learning the foundational math skills they need during the elementary school years. This research study evaluated the effects of an online collaborative elementary math program using team-based games (Sokikom) to improve student math achievement, attitude and motivation. The research questions focus was on achievement, attitude and motivation. Sokikom, (pronounced so-kee-kom) is an online collaborative math program developed through grants from the Institute of Education Sciences (IES), where elementary students help each other learn through a team-based game as well as adaptive, independent learning games. Though a quasi-experimental design, the researchers studied the effects of using Sokikom for 1 year in 2 elementary schools in Oxnard, CA. Specifically, effects on students' mathematics achievement as measured through the end-of-year CA state test. The results showed that there was a significant and positive association between the number of new lessons mastered and math achievement as measured by the California Assessment of Student Performance and Progress (CAASPP) scores ( $p < .0001$ ), which use the Smarter Balanced Assessment. For each additional new lesson mastered a student's CAASPP math score increased 0.58 points. Notably the change in mean on the CAASPP score and the students' intrinsic motivation to learn math. End of study data showed students that used Sokikom reliably, had significantly higher CAASPP math scores (18% higher) than other students, independent of teacher, grade, or school. In addition, students that used Sokikom reliably had more than twice the amount of students that significantly improved motivation and attitude toward learning mathematics compared to other students independent of teacher, grade, or school. The research study also examined the effect reliable-use of Sokikom had on positively changing student math motivation and attitudes for students who find math difficult and boring and students who are curious and excited about math. The latent transition analysis(LTA) findings showed a higher probability of transitioning from the subgroup that found math difficult and boring to the subgroup that were curious and excited about math was for students who used Sokikom reliably, suggesting that Sokikom may have had a positive impact on students' math motivation. For the treated group, the probability of transitioning from the subgroup that found math difficult and boring to the subgroup of students who were curious and excited about math was 0.29, from Time 1 to Time 2. By contrast for the intent to treat group, the probability of transition from the subgroup that found math difficult and boring to the subgroup of students who were curious and excited was 0.14, from Time 1 to Time 2. In general, this research study found that regular use of an online collaborative elementary math game program (Sokikom) by elementary students has the potential to improve math achievement and provide positive motivation in the learning of mathematics.

Keywords: online collaborative games, elementary math, team based games, elementary student math achievement, attitude, motivation, assessment



DISTRICT: **Rio School District**  
 LOCATION: **Oxnard, CA**



### IMPLEMENTATION MODELS

**Individual Self Paced** - Students work at their own pace and level in centers or during math time as directed by the teacher

**Small Group** - Teachers use reports to pinpoint struggling standards, assign specific standards to struggling students, and conduct small-group lessons

**Whole Group Math Instruction** - Teachers use Sokikom to teach Common Core Standards, then assign work through Sokikom based on the Standard



20 minutes per day



3+ times per week



Weekly

### DISTRICT PROFILE

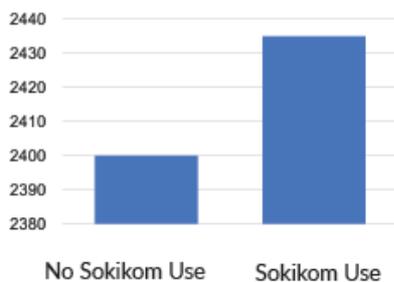
|                      |        |
|----------------------|--------|
| Locale               | City   |
| Enrollment           | 4,692  |
| Grade Levels         | K to 8 |
| % Free/Reduced Lunch | 68%    |
| Minority Students    | 95%    |

### RESEARCH SAMPLE

|                     |           |
|---------------------|-----------|
| School Year.....    | 2014-2015 |
| Grades.....         | 3-5       |
| Total Students..... | 1736      |

### CAASPP MATH SCORES

2014-2015 CAASPP Math Scores



**18%**

higher CAASPP math scores for students using Sokikom reliably

“Students that mastered 25+ Sokikom lessons had significantly higher CAASPP math scores than other students.”



Annie Georges, Ph.D.,  
Senior Researcher

### EDUCATOR THOUGHTS

“Sokikom has redefined our Math curriculum. It has allowed me to teach math more effectively and most importantly, to give students one to one and small group instruction time while the rest of the class is engaged strengthening their math skills.”

*Jovana Tenorio, Teacher - Rio Del Mar*

“Sokikom has been very strategic in using our site benchmark data to plan professional development for my teachers by grade level. By doing so, they were able to help teachers target the areas with which their students struggled the most.”

*Dr. Scott Barlow, Principal - Rio Del Mar*

“Sokikom has been an asset in my classroom for the last two years. It is an excellent source of data I have used it as an assessment tool and in IEP meetings.”

*Lauren Shuster, Teacher - Rio Rosales*

