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 (Jumpstart Academy Math) to improve student math achievement, attitude and motivation. The research questions focus was on achievement, attitude and motivation. Jumpstart Academy Math, 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 Jumpstart Academy Math 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 Jumpstart Academy Math reliably, had significantly higher CAASPP math scores (18% higher) than other students, independent of teacher, grade, or school. In addition, students that used Jumpstart Academy Math 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 Jumpstart Academy Math 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 Jumpstart Academy Math reliably, suggesting that Jumpstart Academy Math 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 (Jumpstart Academy Math) 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 JSA Math to teach Common Core Standards, then assign work through JSA Math based on the Standard

20 minutes per day
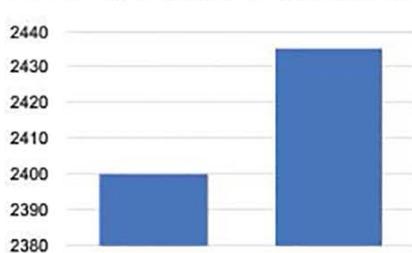
3+ times per week

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

No JSA Math   JSA Math

18% higher CAASPP math scores for students using JSA Math reliably

"Students that mastered 25+ JSA Math lessons had significantly higher CAASPP math scores than other students."

JBS INTERNATIONAL

Annie Georges, Ph.D, Senior Researcher

EDUCATOR THOUGHTS

"JSA Math 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

"JSA Math has been very strategic in sing 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

"JSA Math 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

JUMPSTART ACADEMY Math

*JumpStart Academy Math is formerly known as Sokikom.