

MATH INTERVENTION SUPPORT CASE STUDY

Intervention Support Tutorials for High School Mathematics 2017

PROGRAM OVERVIEW

The below data highlight a cohort of high school students enrolled in a high school math class, at an alternative high school in Texas. Students participated in math intervention pull-out tutorials through a comprehensive support tutorials program in the spring of 2017. Students were selected based on their identified need for intensive mathematics support to complete and successfully pass the Texas Success Initiative (TSI) math tests to prepare them for college & career-ready options upon graduation.

Students were selected and grouped into low, medium, or high level groups based upon initial pre-assessment data as shown below. Tutorials provided by Action Potential Learning involved a comprehensive intervention approach to support, where the tutor focused on deep mastery of grade-level concepts using a gradual release and collaborative learning approach combined with test preparation strategies. Further, the tutor targeted student weaknesses based on ongoing assessments and progress data. This support provided on average 33 hours of instructional time per individual student shown in the data report below.

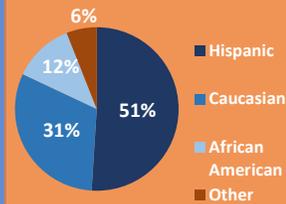


SCHOOL SUMMARY

This high school provides an alternative program that serves 9th- 12th grade students. Students choose to attend this school to complete high school course work at a modified & personalized pace and graduate in an alternative high school setting.



SCHOOL DEMOGRAPHICS



*62% of students came from households with a combined income of less than \$25,000.

FIGURE 1:

Analysis of college & career readiness in mathematics was measured by performance on the Accuplacer® test (College Board), aligned to the Texas Success Initiative standards for students to show mastery of high school level subjects. Upon entering the intervention program, students completed an online practice assessment, the Accuplacer online sample test, under computer-based testing simulated conditions. At the conclusion of the program, students again completed the online practice assessment to measure their growth in the mathematical concepts required for mastery in high school. Of the 13 students that could be tracked using both pre- and post- test data, every student demonstrated growth in mastery of mathematics concepts as shown by an increase in the percent of questions answered correctly at the conclusion of the program.

Accuplacer Practice Math Assessment (Pre & Post Test Comparison By Student)

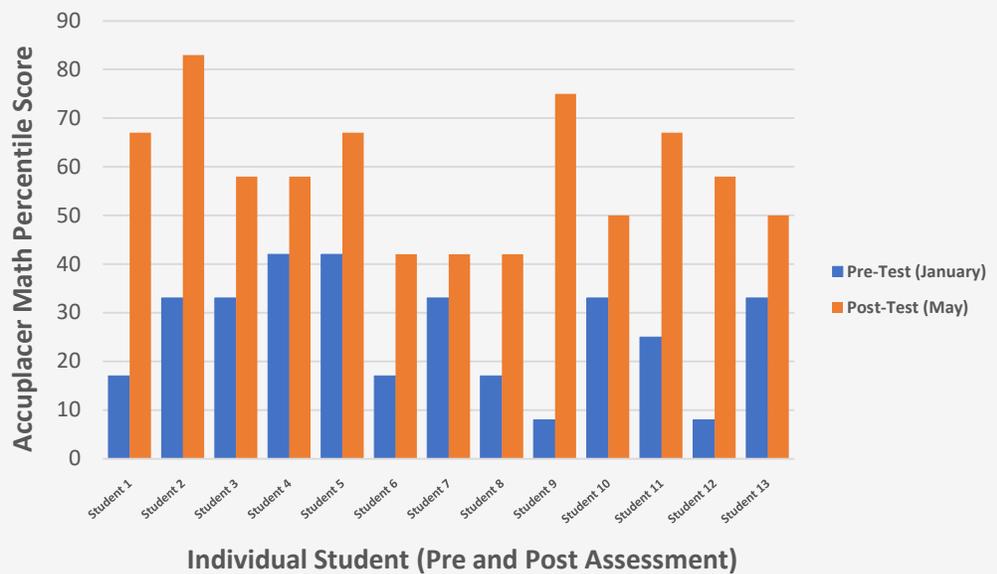
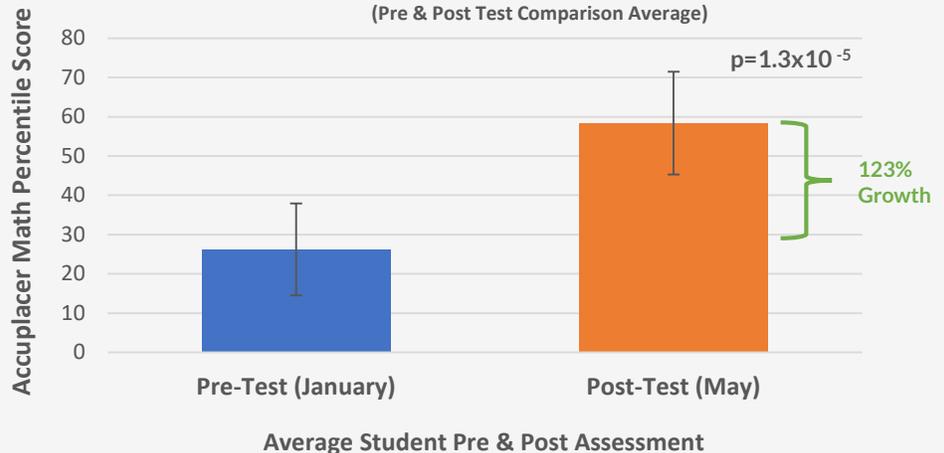


FIGURE 2:

Student mathematics performance growth was statistically significant when comparing post- test performance in May to the pre- test performance in January (T-Test, n=13, $p=1.3 \times 10^{-5}$). The total percent change from pre to post tutorials in math percentile score was 123%. The results suggest that after completion of the intervention program, students demonstrated knowledge of more mathematical concepts required for success in post- secondary college or career- ready areas. Error bars represent standard deviation of each sample set. Percent growth calculated using the following analysis: $((y_2 - y_1) / y_1) \times 100 = \text{percent growth}$. Statistics generated using standard Student's T Test.

AVERAGE Accuplacer Practice Math Assessment Results (Pre & Post Test Comparison Average)



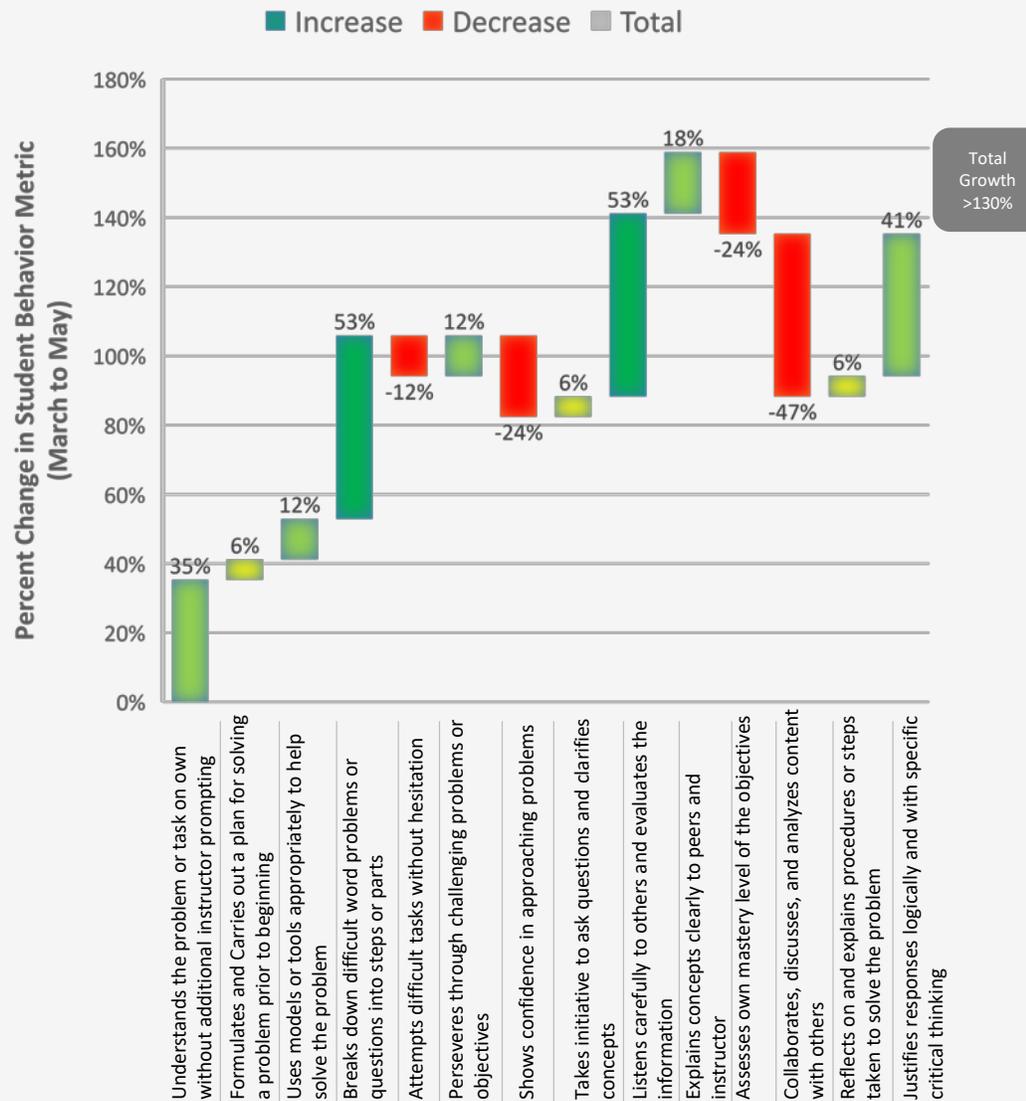
MATH INTERVENTION SUPPORT CASE STUDY

Intervention Support Tutorials for High School Mathematics 2017

FIGURE 3:

Mathematics problem-solving behavioral growth was tracked at two specific time points- March and May of 2017- to provide a more robust understanding of student mathematical abilities and appropriate behaviors throughout the intervention program. Significant improvements in the ability for students to: understand the problem on their own without prompting, break down difficult problems, listen carefully and evaluate information, and justify responses to question with specific critical thinking indicates an improvement in students to complete mathematical tasks more independently than before their involvement in intervention mathematics support. In some cases, however, positive mathematics behaviors decreased during intervention support: the ability to attempt difficult tasks without hesitation, confidence in approaching problems, ability to assess their own mastery, and collaboration, discussion, and analysis of content all showed decreases in these student behaviors over time. This decrease in behavior could be attributed to more challenging concepts introduced and taught as the semester progressed, and more independence and thus greater challenges in problem solving as students mastered the skills required to think critically and attempt problems on their own. The total growth of positive mathematics behaviors throughout the intervention program was greater than 130%, indicating that while some behaviors did decrease over time, the addition of intervention support provided to this cohort results in a positive influence in mathematics problem-solving behaviors, which is an important requirement for post-secondary college and career-readiness.

Tracked Behavior Growth



CONCLUSIONS

Additional support in mathematics instruction, outside of the student's regular classroom instruction, positively impacted student performance in all students in this cohort by an average of 123%. Students showed increased academic performance growth as measured by a standardized mathematics online practice assessment provided by an outside source- the College Board Accuplacer® sample test. Additionally, students showed improvement in mathematics behaviors necessary for success in post- high school life as measured by progress trackers administrated at two time points in the spring semester. These results indicate that the addition of an intervention tutorial support program outside of the student's regular mathematics classroom hours positively benefited their performance and behaviors to help move students toward mastery of concepts required for college or career-readiness.