



## Classworks Efficacy in Elementary School – Renaissance Star

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## Research Summary

Under the Every Student Succeeds Act (ESSA), evidence-based interventions are practices or programs that have evidence showing they are effective at producing results and improving outcomes when implemented; a promising intervention should be supported by one or more correlational studies with controls for selection bias. A goal of this research was to meet tier 3 ESSA standards by analyzing the impact of Classworks intervention while controlling for selection bias. This report analyzes the performance of 15,000 students on Renaissance® Star math and reading assessments. Students who received Classworks instruction outperformed students without exposure to Classworks instruction by significant margins.

## Reading and Mathematics

After the closing of the spring testing window, an analysis was conducted to measure the impact of Classworks® instruction on student growth. The study analyzed Classworks usage and Renaissance® Star assessment data, from fall to spring, across 36 school districts and 15,000 students from the 2018-2019 school year. In this analysis, we compare the growth experienced by Classworks students against Star growth norms and students without exposure to Classworks instruction.

## Results

On the Star math assessment, students who used Classworks instruction averaged 24% more growth than students without Classworks instruction. In reading, Classworks users averaged 30% more growth.

Across all grades, Classworks students outperformed students without Classworks instruction by an average of 23.2 points in math and 33.8 points in reading. These differences were tested for statistical significance. Across all grades and subjects, the differences in growth were statistically significant at the  $p < .05$  level.

## Classworks Treatment Group

For the purposes of this analysis, Classworks users include any students meeting the following criteria:

- ✓ Completed Renaissance Star assessments during the fall and spring testing windows;
- ✓ Attained above a 79 average individualized learning assignment score<sup>1</sup>;
- ✓ Completed a minimum of 10 Classworks assignments.

Creating thresholds for mastery and coursework allows us to control for students who have met the minimum standards of engagement necessary to benefit from Classworks instruction. The guidance provided to districts and schools reflects these thresholds (and exceed them in most cases).

## Control Group

For the purposes of this analysis, students with no Classworks instruction include any students meeting the following criteria:

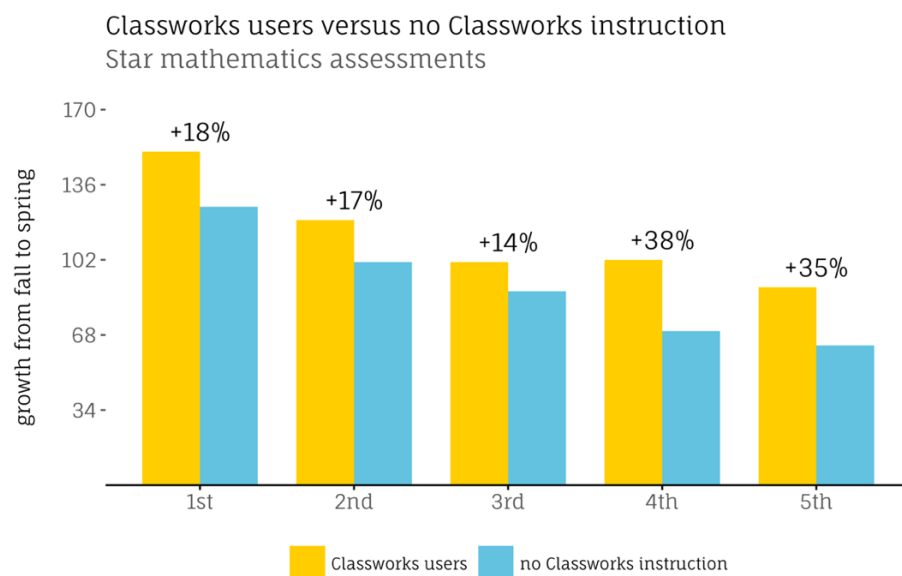
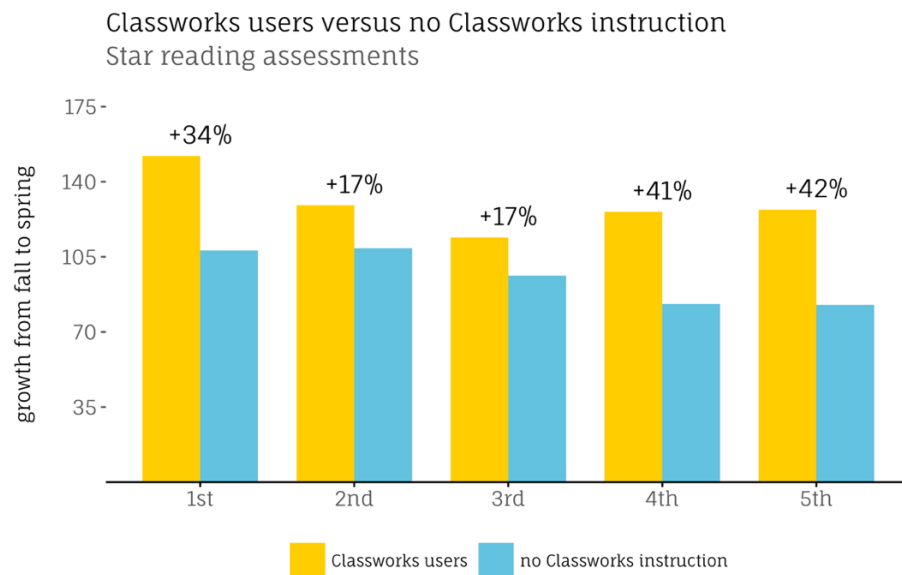
- ✓ Completed Renaissance Star assessments during the fall and spring testing windows
- ✓ Had zero Classworks instruction

## Classworks Students See Stronger Gains

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<sup>1</sup>Individualized learning assignment scores are small quizzes taken at the end of each Classworks unit meant to assess a student's mastery over the unit concepts, we recommend all students who score below an 80 be reassigned that unit until student mastery is demonstrated.

Students receiving Classworks instruction saw significantly more growth from fall to spring in both math and reading. Among students who took both the fall and spring assessments, students who used Classworks averaged 28.5% more growth than students who did not.



## Classworks Users and Star Growth Norms

Comparing Classworks users with non-users limits the scope of our analysis to just the school districts included in this study. In order to show Classworks users against national norms, we analyzed Classworks users against the Star growth norms, from fall to spring, for 50th percentile students. Below, we use a single sample  $t$ -test to measure the magnitude of difference between Classworks student growth and the growth norms for each grade and subject.

These results were significant at the  $p<.05$  level. Across all grades, on both reading and math assessments, Classworks users exceeded the Star growth norms by statistically significant margins.

Classworks students and Star math growth norms:

math	1st	2nd	3rd	4th	5th
$p$ -value	$p<.001$	$p<.001$	$p=.04$	$p<.001$	$p<.001$

Classworks students and Star reading growth norms:

reading	1st	2nd	3rd	4th	5th
$p$ -value	$p<.001$	$p<.001$	$p<.001$	$p<.001$	$p<.001$

Classworks Instruction: Effect Size

Effect sizes<sup>2</sup> help to measure the impact of an educational intervention. The magnitude of effect sizes depends on what outcomes are being measured. For interventions in education, effect sizes tend to be smaller—according to the What Works Clearinghouse, any effect size greater than .25 is considered substantive.<sup>3</sup>

To meet the effect size criteria for the Every Student Succeeds Act (ESSA), we computed effect size using the adjusted mean with the unadjusted standard deviations. For each grade and subject, the effect sizes are positive, meaning Classworks student’s average growth exceeded the average growth of students without Classworks instruction.

standard mean difference between Classworks students and students with no Classworks instruction:

math	1st	2nd	3rd	4th	5th
Hedges’ <i>g</i>	.596	.367	.244	.551	.459

standard mean difference between Classworks students and students with no Classworks instruction:

reading	1st	2nd	3rd	4th	5th
Hedges’ <i>g</i>	.475	.239	.205	.403	.425

## Significantly Greater Gains for Classworks Users

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<sup>2</sup> Effect sizes were calculated using the formula for Hedges’ *g*. This effect size method was selected in order to account for differences in the sample size between groups (see Ellis, 2009, *Effect Size Calculations*. Hong Kong: Hong Kong Polytechnic University).

<sup>3</sup> What Works Clearinghouse – WWC. (2017). *Standards handbook: Version 4.0*. Washington, DC: Institute of Education Sciences, United States Department of Education.

ESSA tier 3 promising evidence requires researchers to control for selection bias, so we included a covariate into our analysis. We conducted an analysis of covariance using student's previous test score as our covariate.

The ANCOVA analysis included 10,000 students who took the fall and spring Star math assessment and 12,000 students who took the fall and spring Star reading assessment. Classworks users experienced significantly more growth than students with no Classworks instruction across all grades and subjects at the  $p < .05$  level.

<b>math</b>	1st	2nd	3rd	4th	5th
<i>F</i> -statistic	$F(1, 2218)$ = 49.8	$F(1, 2283)$ = 33.9	$F(1, 1964)$ = 14.1	$F(1, 1672)$ = 51.2	$F(1, 1786)$ = 27.6
<i>p</i> -value	$p < .001$	$p < .001$	$p < .001$	$p < .001$	$p < .001$

<b>reading</b>	1st	2nd	3rd	4th	5th
<i>F</i> -statistic	$F(1, 2330)$ = 74.4	$F(1, 3045)$ = 23.9	$F(1, 2298)$ = 14.1	$F(1, 2004)$ = 49.0	$F(1, 2237)$ = 56.8
<i>p</i> -value	$p < .001$	$p < .001$	$p < .001$	$p < .001$	$p < .001$

## Conclusion

This analysis was conducted in order to measure the growth of Classworks students against Star growth norms and students without Classworks instruction. To measure Classworks students against the Star norms, we simply used a single sample *t*-test to compare the average growth of a Classworks user against the Star growth norm for each grade and subject. We found that Classworks students exceeded these Star norms by statistically significant margins ( $p < .05$ ) for every grade and subject.

We also produced charts showing the average growth of Classworks students against students without Classworks instruction, which showed Classworks student's growth greatly exceeding the growth of non-users. However, to test the magnitude of these differences, we conducted an analysis of covariance (ANCOVA) to test the difference in growth while controlling for past student performance. Classworks users had significantly higher gains from fall to spring at the  $p < .05$  level across all grades and subjects. Lastly, to further analyze the difference in growth between Classworks students and students without Classworks instruction, we analyzed the effect size of the mean differences across each grade and subject.

The statistical analyses conducted in this report have clearly demonstrated the fact that, across 36 school districts, students receiving Classworks instruction saw greater gains from fall to spring than students not receiving Classworks instruction.