Efficacy Study of Classworks: Early Literacy

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Efficacy Study of Classworks Star Districts

Classworks is a supplemental, online instructional program that provides English language arts, reading, and mathematics instruction for students based on their Renaissance STAR Reading and Mathematics assessment data. In addition, Classworks provides on-grade level, standards-based reading and mathematics instruction to support teachers in the classroom. While using Classworks, students engage with content based on their assessment results. Assessments generated from Classworks measure student growth and progress, and teacher-facing reporting provide formative and longitudinal data, allowing teachers to make data-driven instructional decisions.

The current report presents findings from 44 southeastern school districts who use Classworks instruction and Star Early Literacy assessments. The following evaluation questions are addressed in the present study:

1. Does the adoption of Classworks lead to better outcomes for students?
2. Do these outcomes vary by students' baseline achievement?

Star Early Literacy

Star Early Literacy is an online assessment developed by Renaissance Learning for students in Pre-K through third grade. Star Early Literacy tests students across ten domains: alphabetic principle, the concept of word, visual discrimination, phonemic awareness, phonics, structural analysis, vocabulary, sentence level comprehension, paragraph level comprehension, and early numeracy. While one small portion of the assessment covers numeracy, our analysis focuses on students who used Classworks reading instruction, since the majority of the concepts tested are associated with reading literacy[1]. Classworks reading instruction provides students with instruction on phonological awareness, phonics, fluency, and more.

[1]Some of these students might also have used Classworks math instruction, but this report only includes data from students who interacted with Classworks reading instruction.

Method

Design

The study employed a quantitative method evaluation design to address the research question. The rationale was to obtain and analyze evidence that can explain student achievement outcomes and the influence of Classworks ILP (Individualized Learning Path) educational intervention.

Participants

Classworks pulled data from 44 school districts across the Southeast that use STAR assessments and Classworks educational intervention products. From those 44 districts, we included all the first-grade students who took the Star Early Literacy assessment during both the fall and winter 2018-2019 testing window.

The current report presents data from 34 Elementary Schools who house the treatment and comparison students. To identify the impact of Classworks on students' achievement, we analyzed student performance on the Star Early Literacy assessment. The treatment group was exposed to Classworks instructional software during the Fall semester of first grade, while the comparison group had no exposure to Classworks instructional software. Classworks does not offer ILP instruction[2] to Kindergarten students, so none of the first-grade students in the treatment group had been exposed to Classworks ILP instruction upon beginning their fall semester. According to the U.S. Department of Education's What Works Clearinghouse, equivalence of the intervention and comparison groups must be assessed for the analytic sample. Since none of the first-graders in our sample had exposure to Classworks ILP intervention software, we used first graders' fall Star Early Literacy assessment results as the baseline performance of the groups. The final analytic sample consisted of 623 students (Treatment N = 239; Comparison N = 384)[3] .

[2]Classworks offers individualized learning plans for students at a kindergarten level, but not to kindergarten students (if a third grader is reading at a kindergarten level, Classworks would provide a kindergarten level ILP to that student).

[3]Student sample totals are based on student data for the Star Early Literacy assessments.

An independent sample t-test was conducted to determine if the treatment and comparison group differed significantly in terms of student's baseline achievement. As displayed in Table 1, the difference between the treatment and comparison group was not statistically significant. For first-grade students taking the 2018 Star Early Literacy assessment, the baseline difference was non-significant at p= .98. The standard mean difference (effect size) between the groups' baseline achievement was .002; based on the guidelines established by the U.S. Department of Education's What Works Clearinghouse, these differences satisfy the baseline equivalence requirement, which requires an absolute effect size between 0.00 and 0.05 standard deviations[4]. For differences that are between 0.05 and 0.25 standard deviations, WWC requires a statistical adjustment in order to satisfy baseline equivalence. Because we observed a .002 standard deviation difference, our analysis will not require any statistical adjustments.

Table 1

Baseline achievement for treatment and comparison students (Fall 2018)

	All	Treatment Mean	Comparison Mean	Standard Mean Difference
Grade 1 Star Early Literacy	610.25	610.37	610.17	.002 (n.s.)

Analytic Approach

Since the standard mean difference between the treatment and comparison group was less than .05 standard deviations[5], we used an independent sample t-test to determine if there was a significant difference in the performance of treatment students participating in Classworks and the comparison students who were not exposed to Classworks instruction. The difference of means test was applied to the students' scores from the winter testing window.

[4]What Works Clearinghouse—WWC. (2017). Standards Handbook: Version 4.0. Washington D.C.: Institute of Education Sciences, United States Department of Education.

[5]See previous citation—WWC only requires statistical adjustments for standard mean differences that are greater than .05 standard deviations, in which case we would conduct an ANCOVA analysis to adjust for covariates--"Differences of less than or equal to 0.05 standard deviations require no statistical adjustment."

Results - Usage Data

Descriptive statistics summarizing students' use of Classworks in the Star district are provided in Table 2. The average first grade student spent about ten minutes per week on Classworks instruction over an 18-week semester period. In those 18-weeks, the average student completed 7 Classworks units and maintained an 83% average on Classworks unit assignments (Classworks recommends teachers reassign units when students score below an 80 on the unit assignment).

Table 2

Descriptive Statistics: Classworks Usage Variables

	N	Total Units Completed Mean (SD)	Weekly Minutes on Task (~18) weeks) Mean (SD)	Unit Score Average Mean (SD)
Grade 1 Star Early Literacy	239	7	10	83%

Student Achievement Analysis

The following section presents the results of our analyses of first-grade student performance on the Star Early Literacy assessment. Students in the treatment group exhibited more growth on the Star Early Literacy assessment than students in the comparison group. The size of this difference was a statistically significant effect size of .29 ($p<.01$) with a 95% confidence interval of CI[.12,.45]. Students with Classworks ILP instruction had a mean winter score of 717.74 (a fall to winter growth of 107.73 points), while students without Classworks ILP instruction had a mean winter score of 690.11 (a fall to winter growth of 79.94 points).

Table 3

Treatment and Comparison Group Winter 2019 Star Early Literacy Test

	Treatment	Comparison	Effect Size	Significance
Grade 1 Star Early Literacy	717.71	690.11	.29	***

[Significance: *p < .05, **p < .01, ***p < .001]

In addition to exploring the impact of the Classworks program on overall student achievement, additional analyses were performed that investigated Classworks impact on a select subgroup of lower performing students. Classworks is an educational intervention software that seeks to narrow student learning gaps by accelerating growth in low performing students. To analyze the impact of Classworks ILP instruction on low-performing students, we report Hedge's G effect size calculations to measure the difference in low-performing students with and without Classworks ILP instruction. We look at students with a baseline score below the 50th percentile and below the 25th percentile.

Based on the results of these analyses, students scoring below the 50th and 25th percentile at baseline who used Classworks ILP instruction saw significantly higher winter scores than students without Classworks ILP instruction. For students scoring below the 25th percentile at baseline, the size of this difference was a statistically significant effect size of .57 ($p<.01$) with a 95% confidence interval of CI[.26,.89]. For students scoring below the 50th percentile at baseline, the size of this difference was a statistically significant effect size of .51 ($p<.01$) with a 95% confidence interval of CI[.27,.76].

Table 4

Treatment and Comparison Group Winter 2019 Star Early Literacy Test: Achievement Subgroup

	Treatment	Comparison	Effect Size	Significance
Grade 1 Star Early Literacy				
Below 25th percentile baseline	663.07	604.91	.57	***
Below 50th percentile baseline	679.49	630.05	.51	***

[Significance: *p < .05, **p < .01, ***p < .001]

Conclusion

The purpose of this study was to gather data related to the impact of Classworks on first-grade students across districts that use Star Early Literacy assessments. The report includes program usage data and analyses of student achievement for students with and without Classworks ILP instruction.

The usage data showed mixed results. Ideally, students would spend more time in Classworks instruction, somewhere between fifteen and thirty minutes per week (per subject). However, the quality of students' time spent in Classworks instruction was notable. Classworks recommends students achieve an eighty percent or higher on their unit assignments, otherwise it's recommended that the teacher reassign the unit to that student. The average unit assignment score was 83% for the first-grade students in this study. So, the students mastered concepts to which they were exposed, and teachers took an active role in the instruction through reassigns.

Analysis of student performance data on the Star Early Literacy assessment suggested that learning gains were associated with participation in Classworks ILP instruction. The analysis indicated statistically significant differences favoring the treatment group. The sample of first graders satisfied baseline achievement according to WWC standards, however students exposed to Classworks instruction increased their scores from fall to winter by 27.8 more points than students without Classworks instruction. These differences only widened when selecting for subsets of lower-performing students; among students with a baseline score below the 50th percentile, students with Classworks instruction saw 38.5 more growth points from fall to winter, and 48.2 more for students with baseline scores below the 25th percentile. With the baseline similarities and the significant differences after the treatment was applied, there seems to be a strong association between exposure to Classworks instruction and student achievement.

Appendix A: Baseline Achievement

Baseline achievement for treatment and comparison students (Fall 2018)

	All	Treatment Mean	Comparison Mean	Standard Mean Difference
Grade 1 Star Early Literacy	610.25	610.37	610.17	.002 (n.s.)

Appendix B: Usage Data

Descriptive Statistics: Classworks Usage Variables

	N	Total Units Completed Mean (SD)	Weekly Minutes on Task (~18) weeks) Mean (SD)	Unit Score Average Mean (SD)
Grade 1 Star Early Literacy	239	7	10	83%

Appendix C: Achievement Analysis

Treatment and Comparison Group Winter 2019 Star Early Literacy Test

	Treatment	Comparison	Effect Size	Significance
Grade 1 Star Early Literacy	717.71	690.11	.29	***

[Significance: *p < .05, **p < .01, ***p < .001]

Appendix D: Subgroup Analysis

Treatment and Comparison Group Winter 2019 Star Early Literacy Test: Achievement Subgroup

	Treatment	Comparison	Effect Size	Significance
Grade 1 Star Early Literacy				
Below 25th percentile baseline	663.07	604.91	.57	***
Below 50th percentile baseline	679.49	630.05	.51	***

[Significance: *p < .05, **p < .01, ***p < .001]

About Curriculum Advantage

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Since 2003, millions of students have used our solutions to close learning gaps, keep pace, and grow! We're proud of that! Curriculum Advantage leverages technology to give every student the opportunity to learn and reach their education potential, contributing to equity across schools and districts.

What's our mission? To develop best-in-class technology that transforms teaching and learning by providing the most compelling individualized learning experience on the market.

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