A REVIEW OF THE CLASSWORKS REGIONAL EFFICACY STUDY

Abstract

Student instruction should be based on evidence-based solutions. Toward that end, Curriculum Advantage, Inc. evaluated the impact of Classworks instruction on both reading and mathematics achievement exploring 2018-2019 in NWEA MAP Growth Reading and Mathematics assessment results. Differences in NWEA MAP Growth Reading and Mathematics assessment outcomes between students receiving instruction using Classworks and those not receiving instruction using Classworks were examined.

SEG measurement conducted an independent third-party review of the study design, population, methods, analysis and results. The efficacy study found that students exposed to Classworks instruction achieved greater gains in reading and math than students who did not receive Classworks instruction. SEG measurement concluded that the quasi-experimental study is sound and is consistent with the requirements for Level 2 evidence under the ESSA legislation. Cautions include generalizability of results and the potential effects of employing a post-hoc quasi-experimental design.

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A REVIEW OF THE CLASSWORKS REGIONAL EFFICACY STUDY

ESSA Research Level Classification

Student instruction should rely on solutions that have been proven effective. To that end, the 2016 Every Student Succeeds Act (ESSA) places a greater emphasis on evidence-based education and limits funding to those products that provide strong evidence of effectiveness.

ESSA identifies four levels of evidence with funding requirements tied directly to evidence. Supporting evidence that meets the criteria for a well-executed study are eligible to receive funds. ESSA identifies four levels of research evidence. Level 1 is limited to experimental studies with random assignment, Level 2 centers around quasi-experimental studies, Level 3 includes correlational studies and Level 4 covers other sources of evidence that help provide a rationale for product effectiveness.

Curriculum Advantage, Inc. conducted an evaluation of Classworks in use during the 2018-2019 school year, in grades 6,7 and 8, in 30 schools across the Southeast. This is a sound, quasi-experimental study consistent with the requirements for Level 2 evidence under the ESSA legislation and advice.

This document evaluates the quality of the Regional Efficacy Study focusing on Classworks usage and impact.

Overview of the Study

Fidelity. To effectively evaluate the effectiveness of a product, program or intervention, the actual implementation should be consistent with the program implementation prescribed. This is referred to as fidelity of implementation. Fidelity of program implementation was verified by assessing the extent of student usage of Classworks within the treatment group; usage was evaluated by comparing actual usage levels to recommended minimum usage levels. On average, all students included in the treatment group received a minimum of 30 minutes per week or more of Classworks instruction, within minimum usage guidelines.

Program Impact. The Impact on student reading and mathematics skills was evaluated using a post hoc quasi-experimental design; Curriculum Advantage compared the reading and mathematics growth between students receiving instruction that included Classworks and students not receiving instruction using Classworks. Student reading and math skills were evaluated using the NWEA MAP Growth at the beginning of the year (pretest) and end of the year (posttest). The results of the posttest (dependent variable) were compared for both Classworks users and non-users using Analysis of Covariance (ANCOVA).

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Review of the Study using ESSA Criteria for Study Quality

ESSA identifies several key requirements in evaluating the level of evidence provided by any given study. For ease of review, we have divided these requirements into four primary areas: relevant outcomes, study design, study sample, and effects.

Relevant Outcomes. The study examined important educational outcomes for investigation, as required for a Level 2 ESSA study. The study examines levels of usage and achievement in reading and mathematics. These are both relevant and important educational outcomes to assess the effectiveness of Classworks. The skills are clearly identified, measurable and consistent with the desired educational outcomes of educational administrators, teachers and consumers.

Study Design. The study employs a quasi-experimental design with corrections for initial ability differences, consistent with the expectations for a Level 2 ESSA study.

Study Sample. The study employs a large sample of students in grades 6,7 and 8 (Treatment N=1105; Comparison=801) as required for a Level 2 ESSA study. To ensure comparability in initial ability for both the treatment and comparison groups, the populations studied included students in the 10^{th} to 75^{th} percentile. While a study of this size should be generalizable, caution should be used in extending these findings to the upper end of the population.

Instrumentation. Ideally, a study should employ a third-party, technically-sound measure to evaluate desired outcomes. This avoids potential bias and helps ensure the accuracy of results. This study uses the NWEA MAP Growth assessment, a widely used and respected measure of reading and mathematics. This third-party measure has strong documentation of reliability and validity. The use of a third-party measure is consistent with rigorous research practice.

Effects. The study effectively meets the reporting requirements for a Level 2 study, citing usage levels and both the statistical significance and effect size of the results obtained.

All students in the treatment group reflected an average weekly usage of Classworks of 30 minutes or more. The study found a statistically significant difference in reading outcomes of students using Classworks versus the control group overall. For reading, solid effects were found at all three grade levels, with seventh grade showing the greatest effect (ES=.28), followed by eighth grade (ES=.23), and sixth grade (ES=.18).

For mathematics, Classworks had a positive effect at all three grade levels, with eighth grade showing the greatest effect (ES=.23), followed by sixth grade (ES=.22), and seventh grade (ES=.10). The positive effect for seventh grade failed to reach the conventional .05 level of significance, but still showed a positive impact for Classworks.

These effect sizes indicate that students using Classworks improved their reading skills between about a tenth and a quarter of a standard deviation more than students not using Classworks. This growth is well above what would be expected without Classworks use. The reading growth levels in seventh and eighth grade were at or above the level of achievement seen on average in prior reviews of digital instructional products. The mathematics growth levels in sixth and eighth grade were at or above the level of achievement seen on average in prior reviews of digital instructional products.

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Peer review. The scientific process relies on the evaluation, vetting, and constructive criticism of peers. This report provides an initial peer review, though additional review through submission of a study to a credible journal or professional conference would be beneficial.

Data Analysis. The results were analyzed using Analysis of Covariance. This methodology effectively measures growth while accounting for the initial ability of the students. The analysis methods were appropriate for answering the research questions and for the data collected.

Conclusion

The efficacy study completed by Curriculum Advantage, Inc. is a sound study consistent with the requirements for ESSA, Level-2 evidence of effectiveness. The key findings, that Classworks has a meaningful effect on student reading and mathematics skills growth, are supported by this technically-sound evidence. The results may generalize to similar populations, but caution should be used in generalizing the results to the upper level of the ability distribution.

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Appendix A: Effectiveness Study Evaluation Form

Study Title:	Classworks Efficacy in Middle School - NWEA 2018-2019
Dates Conducted:	Fall 2018 - Spring 2019
Study Site(s)/Location:	Thirty schools in the Southeast region
Primary Researcher, Research Organization Name:	Curriculum Advantage, Inc.
Sponsoring Organization:	Curriculum Advantage, Inc.

(Check One)	ESSA Evidence Classification Level
	Level 1: Experimental Study
X	**Level 2: Quasi Experimental Study**
	Level 3: Correlational Study
	Level 4: Rationale Supporting Product Effectiveness

ESSA Criteria ("Well designed and implemented study")	Ratings/Notes
Relevant Outcome **- Clarity** **- Measurability** **- Goal and Outcome Alignment**	The research questions address student use of Classworks and reading and mathematics achievement outcomes. The targeted outcomes are clearly Stated, measurable and replicable. The treatment and outcomes were clearly operationalized. The outcomes (NWEA MAPS) were well-aligned with the intended educational goals.
Study Design **- Qualitative/Quantitative** **- Experimental versus Observational**	The study employs a sound quasi experimental design comparing students using Classworks (treatment) to those students not using Classworks as part of their instruction (control). The comparisons cover those students in the 10th to 75th percentile in order to ensure group comparability
Study Sample **- Sampling Method** **- Number of Participants** **- Number of Sites** **- Representativeness/Population Overlap** **- Generalizability**	The study relies on a large sample of 1,840 across 30 regional sites, typical of schools within the region. The treatment and control groups were reasonably matched by targeting students in the 10th to 75th percentile, though not randomly selected. Demographic data for study participants was unavailable for confidentiality reasons. It is reasonable to assume that these results would generalize to others within this population at the 10th to the 75th percentile.

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Effects **- Clarity and Accuracy of Findings** **- Statistical Significance, Effect size Reported** **-Favorable Effects** **- Inclusion of Data/Tables**	Descriptive statistics reported; Levels of statistical significance reported; effect size reported; data tables of sufficient detail included. The study reports educationally meaningful effect sizes for Classworks use.
Peer Review **-external review** **-conference/journal**	This study was submitted to SEG Measurement for external review (of which this report is an outcome). Curriculum Advantage may also wish to submit this research to more traditional forms of Peer review (such as professional conferences and journals).
Study Sponsorship and Funding **-Study Sponsor** **-Funding Source/Third Party** **-Purpose**	This study was sponsored by and funded by Curriculum Advantage and independently reviewed by a third party research organization, SEG Measurement. The purpose, to guide school administrators and teachers in selecting and using Classworks, is clearly stated.
Instrumentation/Measures **-Study Specific/local/third party** **-Reliability** **-Validity**	The study uses xxx state assessment results as the outcome measure and uses actual usage data to identify treatment group and levels of use measurement, with demonstrated validity and reliability.
Data Analysis **- Appropriateness of Methodology** **- Assumptions Met** **- Missing Data**	Analysis of Covariance (ANCOVA) used to compare the relationship between program use and assessment outcomes. Groups were within the generally accepted ¼ standard deviation on the outcome measure. Missing data and attrition levels are reported.

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Appendix B: Study Report

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Classworks Efficacy in Middle School - NWEA 2018-19

Table of Contents

Executive Summary and Every Student Succeeds Act (ESSA)

Under the Every Student Succeeds Act (ESSA), evidence-based interventions are practices or programs that have evidence to show that they are effective at producing results and improving outcomes when implemented; a promising intervention should be supported by one or more studies with controls for selection bias. The current report includes a quasi-experimental study analyzing achievement differences between middle school students with and without exposure to Classworks individualized instruction. We control for selection bias by using students' baseline achievement as a covariate in our analysis of covariance. In both mathematics and reading, middle school students with exposure to Classworks individualized instruction see significantly higher post test scores than students without exposure to Classworks instruction— the overall standard mean difference is .193 for math and .263 for reading. The report also includes grade level and subgroup analyses.

Efficacy Study: Classworks & NWEA MAP Growth

Classworks is a supplemental, online instructional program that provides English language arts, reading, and mathematics instruction for students based on their NWEA MAP Growth 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 individualized 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.

Classworks provides instructional software to 30 NWEA school districts across the southeast. The current report explores the impact of Classworks use on reading and math achievement during the 2018-2019 school year. The following evaluation questions are addressed in the present study:

- Do middle school students with exposure to Classworks instruction outperform students without exposure to Classworks instruction?
- What are the effects in reading versus mathematics?
- Do impacts on student outcomes vary by prior student achievement?

Method

Design

The study employed a quantitative quasi-experimental evaluation design to address the research questions. The rationale was to obtain and analyze evidence that can explain the influence of Classworks individualized instruction on student achievement outcomes.

Participants

The current report uses data from thirty school districts across the Southeast that use NWEA MAP Growth assessments and Classworks educational intervention products. The report includes all middle school students from those thirty school districts[1] who took the NWEA Reading or Mathematics assessments during both the fall and spring testing windows of the 2018-2019 school year. Data from the treatment and comparison groups was retrieved from twenty-five middle schools.

To identify the impact of Classworks Individualized instruction on students' achievement, we analyzed student performance on the NWEA MAP Growth Reading and Mathematics assessments, adjusting for initial ability.

The current analysis includes all NWEA data from the 2018-2019 school year and evaluates trends among Classworks students and students with no exposure to Classworks instruction. Therefore, since we didn't follow the procedures of a randomized control trial (due to the feasibility of such an experiment), the students who had exposure to Classworks instruction had significantly different baseline achievement scores than students with no exposure to Classworks instruction. If we continued our analysis as is, any analysis of post-test scores or measures of student growth would be meaningless.

In order to compare groups of students, while meeting the requirements for baseline equivalence, we include in this analysis only students who scored between the 10th and 75th percentile on the fall NWEA MAP Growth Reading and Math assessments. This allows a comparison between similar students who did and did not have exposure to Classworks individualized instruction,

[1] Sixth through eighth grade students were included.

with a goal of understanding the impact that Classworks has on student performance. We also apply statistical controls to further control for any pre-intervention differences between groups.

To identify the impact of Classworks on students' achievement, we analyzed student performance on the fall and spring NWEA MAP Growth Reading and Mathematics assessments. The treatment group consisted of students who had exposure to Classworks instruction at any point during the 2018-2019 school year. The achievement of these students was compared with that of students who did not use the program. The final analytic sample for the reading analysis consisted of 25 middle schools and 1,840 students (Treatment N = 1,100; Comparison N = 740). The final analytic sample for the mathematics analysis consisted of 25 middle schools and 1,906 students (Treatment N = 1105; Comparison N = 801).

As displayed in Table 1, there were statistically significant differences between treatment and comparison groups on baseline achievement. Across all grades combined, the baseline performance of the groups differed significantly for MAP Growth Reading and Mathematics. For the Reading assessment, the treatment group had higher baseline achievement than the comparison group. For Mathematics, the treatment group had lower baseline achievement than the comparison group. However, those trends in mathematics did not appear when grade levels were examined individually. The baseline performance of the groups differed significantly across all grades on MAP Growth Reading, with the treatment group experiencing higher baseline achievement in each grade. The effect size margin in these areas ranged from -0.16 to 0.24. Based on the guidelines established by the U.S. Department of Education's What Works Clearinghouse, these differences

are considered within the threshold of baseline equivalence (see WWC, 2017[2]). For any standard mean difference greater than |.05| standard deviations, the WWC requires statistical adjustments for the baseline characteristics to meet the baseline equivalence requirement.

Table 1

Baseline achievement characteristics for treatment and comparison students (2018-19)

	All	Treatment Mean	Comparison Mean	Standard Mean Difference
Overall Sample				
Reading Baseline Score (NWEA)	211.15	211.61**	210.47	.14
Math Baseline Score (NWEA)	216.41	215.79	217.26***	-.16
Grade 6				
Reading Baseline Score (NWEA)	207.87	208.53**	206.54	.24
Math Baseline Score (NWEA)	212.22	211.98	212.76	n.s.
Grade 7				
Reading Baseline Score (NWEA)	211.04	211.67*	210.26	.18
Math Baseline Score (NWEA)	216.97	216.84	217.12	n.s.
Grade 8				
Reading Baseline Score (NWEA)	214.08	214.71	213.26*	.18
Math Baseline Score (NWEA)	220.44	220.60	220.30	n.s.

*p < .05; **p < .01; ***p < .001; n.s. = no significant difference

Analytic Approach

Analyses of covariance (ANCOVA) were conducted to determine if there was a significant difference in the performance of treatment students participating in Classworks[3] and the comparison students without exposure to Classworks. These analyses compared the 2018-2019 the reading and

[2] What Works Clearinghouse – WWC. (2017). Standards handbook: Version 4.0. Washington, DC: Institute of Education Sciences, United States Department of Education.

[3] The treatment group was limited to students in treatment schools who were recorded as using the Classworks program (as measured by Classworks usage data).

math achievement[4] of these two groups while controlling for two covariates: baseline reading and math achievement and grade level.[5] The fall baseline scores were used as a covariate to further account for any group differences before the intervention.

Additional analysis was also performed that investigated whether or not the program had any significant impact on select subgroups of students. Here we look at students above and below the 50th percentile in baseline performance on the NWEA MAP Growth assessments.

Results

The following results present an integration of all data collected regarding student achievement data and program usage data. We begin with the program usage data, showing how each grade interacted with the program. Then, we present the impact of the program on student achievement.

Usage Data. Descriptive statistics summarizing students' use of Classworks in NWEA school districts are provided in Table 2. Across sixth through eighth graders, the program was used less for English/Language Arts than Mathematics for Across sixth through eighth graders. Seventh grade had similar usage across both subjects. For Mathematics, sixth grade students used the program with the most frequency, followed by eighth grade and

[4] In all analyses, students' scale scores were used as the dependent variable. For the NWEA MAP Growth assessments, which are given to students multiple times each year, the dependent variable was the final exam taken by students during the 2018-19 school year. To control for variability between schools in their NWEA administration schedules, the sample was limited to exams administered on or after April 1st, 2019.

[5] To control for grade level effects, including those associated with differences in NWEA assessments between levels, a vector of dummy variables specifying student grade level was used. These controls were only incorporated for analyses of sixth through eighth grade combined achievement. For analyses that examined the performance of grade levels individually, this vector of dummy variables was omitted from the model.

seventh grade. For English/Language Arts, seventh grade students used the program most, followed by sixth and eighth grade.

Table 2

Descriptive Statistics: Classworks Usage Variables

	English/Language Arts			Mathematics		
		Total Units	Hours on Task		Total Units	Hours on Task
	N	M	M	N	M	M
6th Grade	399	26.36	13.36	471	30.81	20.31
7th Grade	309	33.93	17.07	333	28.95	14.68
8th Grade	392	28.55	11.94	301	34.91	17.26
Overall	1100	29.27	13.90	1105	31.37	17.78

Student achievement analyses. The following section presents the results of our analyses of student reading and math performance on the NWEA MAP Growth assessments. We begin with results specific to reading, followed by math results.

Reading results: Across all grades combined, after controlling for the covariates (student grade and prior student achievement), students in the treatment group exhibited more growth on the NWEA Reading exam than students in the comparison group. The size of this difference was a statistically significant effect size of .263 [$F(1, 1836) = 50.53$, $p < .001$]. Analyses also examined differences between the groups for each grade level individually. Here, statistically significant differences favoring the performance of the students in the treatment group were found in all three

grade levels studied, sixth, seventh, and eighth grade (see Table 3). These results are summarized as follows:

- In sixth grade, the adjusted mean NWEA Reading assessment score for the treatment group was 212.06 and for the comparison group was 209.44. This difference reflected a statistically significant effect size of .183 [$F(1, 592) = 8.75$, $p < .01$].

- In seventh grade, the adjusted mean NWEA Reading assessment score for the treatment group was 213.72 and for the comparison group was 208.51. This difference reflected a statistically significant effect size of .283 [$F(1, 554) = 21.94$, $p < .001$].

- Lastly, in eighth grade, the adjusted mean NWEA Reading assessment score for the treatment group was 215.39 and for the comparison group was 211.33. This difference reflected a statistically significant effect size of .233 [$F(1, 685) = 18.45$, $p < .001$].

Table 3

Treatment and Comparison Group 2018-2019 NWEA MAP Growth Reading Assessment

	Treatment	Comparison	Effect Size	Significance
Grade 6				
Observed Mean	212.57	208.40		
Adjusted Mean	212.06	209.44	.183	**
Grade 7				
Observed Mean	214.29	207.79		
Adjusted Mean	213.72	208.51	.283	***
Grade 8				
Observed Mean	215.93	210.62		
Adjusted Mean	215.39	211.33	.233	***

*p < .05; **p < .01; ***p < .001; n.s. = no significant difference

In addition to exploring the impact of the Classworks program on overall student achievement, additional analyses were performed that investigated whether or not the program was correlated with any significant impact for select subgroups of students. Specifically, an analysis of covariance was used to examine whether the Classworks program fostered any differential impact students below and above the 50th percentile in baseline reading score.

Based on the results of these analyses, the reading performance of five student subgroups were found to significantly differ between the treatment and comparison groups. Seventh and eighth grade students in the treatment group who scored below the 50th percentile at baseline had significantly higher post-test scores than those students in the comparison group. Also, sixth, seventh, and eighth grade students in the treatment group who scored above the 50th percentile at baseline had significantly higher post-test scores than those students in the comparison group. Table 4 below provides the adjusted mean scores for students in each of these subgroups.

Table 4

Treatment and Comparison Group 2018-19 NWEA Scores for Student Subgroups (Reading)

	Treatment M (SE)	Comparison M (SE)
Below 50th percentile at baseline (6th)	207.41 (.70)	206.35 (.89)
Below 50th percentile at baseline (7th)	209.13 (.95)***	204.28 (.97)
Below 50th percentile at baseline (8th)	211.09 (.87)**	207.26 (.95)
Above 50th percentile at baseline (6th)	219.22 (.70)***	213.35 (1.2)
Above 50th percentile at baseline (7th)	221.50 (1.2) **	215.72 (1.6)
Above 50th percentile at baseline (8th)	222.5 (.82)***	218.05 (1.0)

*p < .05; **p < .01; ***p < .001; n.s. = no significant difference

Mathematics results: Across all grades combined, after controlling for the covariates (student grade and prior student achievement =), students in the treatment group exhibited more growth on the NWEA Mathematics exam than students in the comparison group. The size of this difference was a statistically significant effect size of .198 [F(1, 1902) = 36.26, p < .001]. Analyses also examined differences between the groups for each grade level individually. Here, statistically significant differences favoring the performance of the students in the treatment group were found in sixth and eighth grade (see Table 3). In seventh grade, significant differences were not found between the groups. These results are summarized as follows:

- In sixth grade, the adjusted mean NWEA Math assessment score for the treatment group was 219.97 and for the comparison group was 217.06. This difference reflected a statistically significant effect size of .215 [*F*(1, 680) = 13.47, p < .001].

- In seventh grade, the adjusted mean NWEA Math assessment score for the treatment group was 221.95 and for the comparison group was 220.19. This difference reflected a non-significant effect size of .098 [*F*(1, 592) = 2.83, p = .093].[6]

- Lastly, in eighth grade, the adjusted mean NWEA Math assessment score for the treatment group was 226.17 and for the comparison group was 222.92. This difference reflected a statistically significant effect size of .227 [*F*(1, 625) = 16.16, p < .001].

[6] Grade 7 did not exceed the suggested usage threshold of 30 minutes per week—grades 6 and 8 did exceed this threshold.

Table 5

Treatment and Comparison Group 2018-2019 NWEA MAP Growth Mathematics Assessment

	Treatment	Comparison	Effect Size	Significance
Grade 6				
Observed Mean	219.71	217.63		
Adjusted Mean	219.97	217.06	.215	***
Grade 7				
Observed Mean	221.82	220.36		
Adjusted Mean	221.95	220.19	.098	
Grade 8				
Observed Mean	226.34	222.76		
Adjusted Mean	226.17	222.92	.227	***

*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 whether or not the program was correlated with any significant impact for select subgroups of students. Specifically, an analysis of covariance was used to examine whether the Classworks program fostered any differential impact students below and above the 50th percentile in baseline mathematics score.

Based on the results of these analyses, the mathematics performance of three student subgroups were found to significantly differ between the treatment and comparison groups. Sixth and eighth grade students in the treatment group who scored below the 50th percentile at baseline had significantly higher post-test scores than those students in the comparison group. Also, sixth grade students in the treatment group who scored above the 50th percentile at baseline had significantly higher post-test scores than those students in the comparison group. Table 6 below provides the adjusted mean scores for students in each of these subgroups.

Table 6

Treatment and Comparison Group 2018-19 NWEA Scores for Student Subgroups (Math)

	Treatment M (SE)	Comparison M (SE)
Below 50th percentile at baseline (6th)	216.05 (.52)**	213.18 (.79)
Below 50th percentile at baseline (7th)	217.97 (.85)	215.95 (.98)
Below 50th percentile at baseline (8th)	221.78 (.72)***	218.28 (.68)
Above 50th percentile at baseline (6th)	231.47 (.82)*	228.47 (1.1)
Above 50th percentile at baseline (7th)	233.49 (1.1)	232.36 (1.2)
Above 50th percentile at baseline (8th)	237.47 (.97)	234.83 (.95)

*p < .05; **p < .01; ***p < .001

Conclusion

The purpose of this study was to gather data related to the impact of Classworks on middle school student achievement across NWEA districts throughout the Southeast. The report includes program usage data and analyses of student achievement for students with and without Classworks individualized instruction.

The usage data showed that the program was implemented well within these districts. While not all grades exceeded the thirty minute per week threshold recommended to schools, most grades were close; in reading, grades 6 and 8 failed to exceed the thirty minute threshold. In math, only 7th grade failed to exceed the threshold. The students also completed an adequate number of Classworks units, averaging about one unit per week across each grade and subject.

Analysis of student performance data on the NWEA assessments suggests that learning gains are associated with participation in Classworks individualized instruction. The analysis indicated statistically significant differences favoring the treatment group in all grades and subjects except for seventh grade math.[7] The report also included a subgroup analysis, which looked at post-test differences in students scoring baseline above and below the 50th percentile. Classworks users had significantly higher scores for several grades and subjects within those subcategories (Table 4 and Table 6). In none of these analyses did the comparison group outscore the treatment group. With the Baseline similarities and the significant differences after the treatment was applied, there seems to be a strong impact of Classworks instruction on student achievement.

[7] Classworks users in seventh grade math had higher post-test scores than the comparison group, however the differences weren't statistically significant at the $p < .05$ level.

Appendix: Achievement Analyses

Table 1

Baseline achievement characteristics for treatment and comparison students (2018-19)

	All	Treatment Mean	Comparison Mean	Standard Mean Difference
Overall Sample				
Reading Baseline Score (NWEA)	211.15	211.61**	210.47	.14
Math Baseline Score (NWEA)	216.41	215.79	217.26***	-.16
Grade 6				
Reading Baseline Score (NWEA)	207.87	208.53**	206.54	.24
Math Baseline Score (NWEA)	212.22	211.98	212.76	n.s.
Grade 7				
Reading Baseline Score (NWEA)	211.04	211.67*	210.26	.18
Math Baseline Score (NWEA)	216.97	216.84	217.12	n.s.
Grade 8				
Reading Baseline Score (NWEA)	214.08	214.71	213.26*	.18
Math Baseline Score (NWEA)	220.44	220.60	220.30	n.s.

*p < .05; **p < .01; ***p < .001; n.s. = no significant difference

Table 2

Descriptive Statistics: Classworks Usage Variables

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Overall	1100	29.27	13.90	1105	31.37	17.78

Classworks

Table 3

Treatment and Comparison Group 2018-2019 NWEA MAP Growth Reading Assessment

	Treatment	Comparison	Effect Size	Significance
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Observed Mean	214.29	207.79		
Adjusted Mean	213.72	208.51	.283	***
Grade 8				
Observed Mean	215.93	210.62		
Adjusted Mean	215.39	211.33	.233	***

*p < .05; **p < .01; ***p < .001; n.s. = no significant difference

Table 4

Treatment and Comparison Group 2018-19 NWEA Scores for Student Subgroups (Reading)

	Treatment M (SE)	Comparison M (SE)
Below 50th percentile at baseline (6th)	207.41 (.70)	206.35 (.89)
Below 50th percentile at baseline (7th)	209.13 (.95)***	204.28 (.97)
Below 50th percentile at baseline (8th)	211.09 (.87)**	207.26 (.95)
Above 50th percentile at baseline (6th)	219.22 (.70)***	213.35 (1.2)
Above 50th percentile at baseline (7th)	221.50 (1.2) **	215.72 (1.6)
Above 50th percentile at baseline (8th)	222.5 (.82)***	218.05 (1.0)

*p < .05; **p < .01; ***p < .001; n.s. = no significant difference

Classworks

Table 5

Treatment and Comparison Group 2018-2019 NWEA MAP Growth Mathematics Assessment

	Treatment	Comparison	Effect Size	Significance
Grade 6				
Observed Mean	219.71	217.63		
Adjusted Mean	219.97	217.06	.215	***
Grade 7				
Observed Mean	221.82	220.36		
Adjusted Mean	221.95	220.19	.098	
Grade 8				
Observed Mean	226.34	222.76		
Adjusted Mean	226.17	222.92	.227	***

*p < .05; **p < .01; ***p < .001

Table 6

Treatment and Comparison Group 2018-19 NWEA Scores for Student Subgroups (Math)

	Treatment M (SE)	Comparison M (SE)
Below 50th percentile at baseline (6th)	216.05 (.52)**	213.18 (.79)
Below 50th percentile at baseline (7th)	217.97 (.85)	215.95 (.98)
Below 50th percentile at baseline (8th)	221.78 (.72)***	218.28 (.68)
Above 50th percentile at baseline (6th)	231.47 (.82)*	228.47 (1.1)
Above 50th percentile at baseline (7th)	233.49 (1.1)	232.36 (1.2)
Above 50th percentile at baseline (8th)	237.47 (.97)	234.83 (.95)

*p < .05; **p < .01; ***p < .001