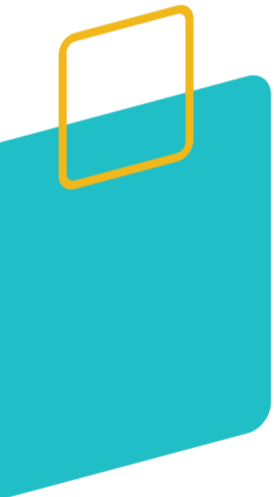




Impact of *i-Ready Personalized Instruction* with Fidelity on Student Achievement in Mathematics

Executive Summary | February 2023



Overview

The Center for Research and Reform in Education (CRRE) at Johns Hopkins University (JHU) conducted a research study to examine the impact of *i-Ready Personalized Instruction* (i.e., *i-Ready*) on the mathematics achievement of students from five school districts across Massachusetts. Using a quasi-experimental design study and data from the 2020–2021 school year, CRRE found that students who used *i-Ready* with fidelity outperformed students who did not use *i-Ready* on the Massachusetts Comprehensive Assessment System for Mathematics (MCAS Mathematics).

The design of this research study meets the Every Student Succeeds Act (ESSA) Level 2 criteria for Moderate Evidence. The results from this study demonstrate that using *i-Ready* instruction is related to improved performance on a state summative test. The results of this study are summarized here.

The following paper summarizes results for *i-Ready Personalized Instruction for Mathematics*. To learn more about the results for *i-Ready Personalized Instruction for Reading* on the MCAS and other *i-Ready* research, click [here](#).

Introduction

The 2020–2021 school year was a challenging year for educators, students, and communities due to the global COVID-19 pandemic. Across the country, national and statewide standardized assessments showed a decline in both mathematics and reading scores (NAEP, 2022a; 2022b). The CRRE at JHU was contracted by Curriculum Associates to conduct an efficacy study of the effects of *i-Ready*, and specifically for students meeting Curriculum Associates' usage guidance (i.e., used *i-Ready* with fidelity), during the 2020–2021 school year. The full report, *The Impact of i-Ready Personalized Instruction with Fidelity on 2021 MCAS Mathematics Achievement*, by Michael Cook and Steven Ross (2022) is available [here](#).

i-Ready is a research-based program for Grades K–8 students with an individualized plan for instruction based on each student's performance on the online, adaptive *i-Ready Diagnostic* (i.e., Diagnostic). Once students complete the Diagnostic, *i-Ready* builds a unique lesson plan with a differentiated starting point for every learner based on their overall and domain-level placement. *i-Ready* allows teachers to add lessons and/or adjust the lesson sequence provided to individuals or groups of students. *i-Ready* is aligned to college- and career-ready standards and embeds multimedia instruction and progress monitoring into every online lesson. Lessons provide explicit instruction and extensive practice, offer supportive feedback, and build conceptual understanding for learners of all levels. Curriculum Associates recommends that all students using *i-Ready* maintain an average of 30–49 minutes of lesson time-on-task per subject per week with at least 70% of lessons passed for the year.

Study Overview

The purpose of the research study was to examine the impact of using *i-Ready* with fidelity on achievement gains on Massachusetts' state summative assessment, the MCAS Mathematics, between students who used *i-Ready* with fidelity (i.e., *i-Ready* group) and students who did not use *i-Ready* (i.e., comparison group). This study included 5,752 students in five Massachusetts school districts. This study was designed to learn more about the effectiveness of *i-Ready* on student achievement on a state summative assessment, particularly during a school year in which students faced significant learning disruption. This study provides evidence that using *i-Ready* with fidelity can improve student achievement outcomes on the MCAS Mathematics, even in a year when student achievement across the nation declined and students faced significant unfinished learning.

Student data was originally obtained from more than 18,000 K–8 students from five school districts in Massachusetts. All students included in the study tested in person. The sample included 3,170 students who used *i-Ready* instruction and 2,582 students who were in the comparison group.

Included in the data sources for this study are *i-Ready Diagnostic* scores, *i-Ready* usage data, student demographic data, and student MCAS scores. Student data from the 2020–2021 school year were analyzed to compare achievement gains between students who received *i-Ready* instruction and students who did not receive *i-Ready* instruction throughout the school year. Student data in Grades 3–8 were analyzed by examining patterns of MCAS and Diagnostic scores and *i-Ready* usage and comparing achievement patterns between students who used *i-Ready* with fidelity and comparison group students.

Researchers used Hierarchical Linear Modeling at each grade level to compare the differences in MCAS achievement between the *i-Ready* and comparison group students. Baseline equivalence was not initially met for fall 2020 Diagnostic scores across all grade levels. Further, MCAS assessments were not completed in spring 2020 due to COVID-19-related school closures, which is why fall Diagnostic scale scores served as the pre-achievement measure for this study. To adjust for the large standardized mean differences between the *i-Ready* and comparison group students on baseline achievement, propensity score weighting was used for the purpose of creating comparison groups that were as similar as possible (e.g., prior achievement, demographics) to the groups of *i-Ready* students. As analyses were intended to be performed by grade level, propensity score weighting was also conducted separately at each grade level.

Findings

CRRE researchers found that, across Grades 3–8, using *i-Ready* was associated with statistically significantly positive effects, with *i-Ready* students scoring an average of 8 points higher than their grade-level peers who did not use *i-Ready*. Within Grades 3–8, students who used *i-Ready* with fidelity scored 2–17 points higher, on average, on the MCAS Mathematics assessment than students who did not use *i-Ready*. When grouped by grade bands, using *i-Ready* with fidelity was associated with statistically significantly positive effects for elementary

school (outgaining comparison groups by 9 points on average) and middle school students (outgaining comparison students by 7 points on average). See Graph 1 and Table 1.

Graph 1. Spring MCAS Mathematics Scores for *i-Ready* Students above and beyond the Comparison Group Students

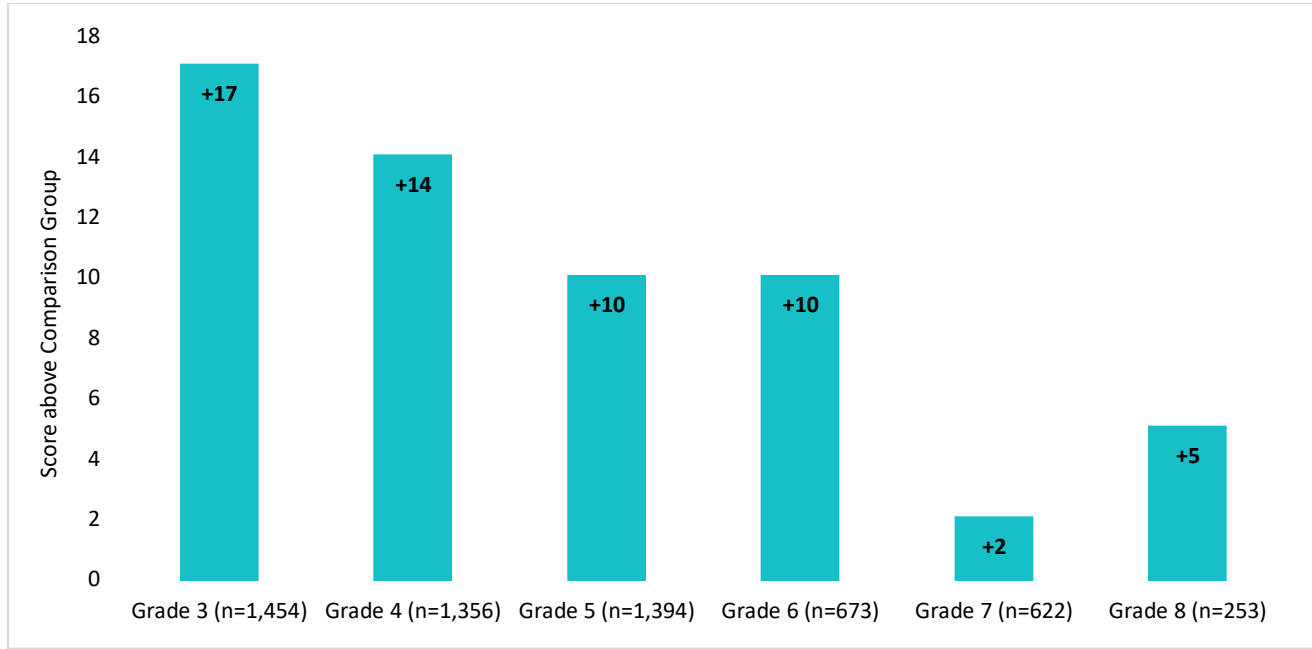


Table 1. Impact of *i-Ready* on MCAS Mathematics Scores by Grade Level and Grade Band Group

Treatment Group	Number of Students	Score Gain above Comparison Group	Effect Size
By Grade Level			
Grade 3	1,454	+17***	.72
Grade 4	1,356	+14	.67
Grade 5	1,394	+10*	.52
Grade 6	673	+10**	.53
Grade 7	622	+2	.11
Grade 8	253	+5*	.26

By Grade Band			
Elementary (Grades 3–5)	4,204	+9***	.43
Middle (Grades 6–8)	1,548	+7**	.31
By All <i>i-Ready</i> Users			
All Grades (3–8)	5,752	+8***	.37

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

While results at every grade level were not statistically significant, results across all grade levels were directionally positive. A lack of statistical significance in Grades 4 and 7 was due to factors such as treatment group size (i.e., analyses may have been underpowered to find a treatment effect), variability in MCAS scores due to out-of-school testing at the lower grades, and increased variability as a result of propensity score weighting that resulted in larger standard errors in some grades.

Conclusion

This study demonstrates the relationship between using *i-Ready Personalized Instruction* for Mathematics with fidelity and achievement on a statewide summative assessment during the 2020–2021 school year. CRRE researchers observed statistically significant positive effects of *i-Ready* on MCAS Mathematics scores in Grades 3, 5, 6, and 8, with *i-Ready* students in all grades averaging 2–17 points higher than their comparison group counterparts on the MCAS Mathematics assessment. The findings from this study establish a positive influence of *i-Ready* on MCAS achievement while also suggesting a magnitude of effects that are comparable or larger than other educational programs on standardized assessment outcomes (Lipsey et al., 2012). The results of this study will, hopefully, benefit educators using *i-Ready* or those considering using *i-Ready*. In addition, students can significantly benefit from using *i-Ready* with fidelity to help improve their achievement outcomes in an era in which we are continuing to adjust to learning transitions and disruptions related to the pandemic.

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