ESSA Level 2
Striving Learners

i-Ready

i-Ready Improves Outcomes for Striving Learners

Evidence to Support Addressing Unfinished Learning

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i-Ready Personalized Instruction Improves Striving Learners' Reading and Mathematics Achievement

Study Overview

The Human Resources Research Organization (HumRRO) and Century Analytics conducted a research study to examine the impact of *i-Ready Personalized Instruction* ("*i-Ready*") on reading and mathematics achievement for striving learners (i.e., students who placed Two or More Grade Levels Below in the fall). Using a quasi-experimental design (QED) study and data from the 2018–2019 school year, HumRRO and Century Analytics demonstrated that striving learners who used *i-Ready* as recommended performed better than striving learners who did not use *i-Ready*. In addition, the research shows that Black and Latino students who used *i-Ready* as recommended experienced significantly greater gains in student achievement compared to Black and Latino students who did not use *i-Ready*.

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 *i-Ready* instruction is effective in improving striving learners' reading and mathematics achievement, which provides evidence that *i-Ready* can be used as effective instruction with students who have unfinished learning.

Introduction

i-Ready Personalized Instruction is designed to help educators accelerate growth and grade-level learning for all students. Numerous studies conducted by independent researchers, third-party research firms, and Curriculum Associates' own Research team have shown that across all students in Grades K–8, *i-Ready* helps students experience greater learning gains in reading and mathematics. To strengthen the research evidence demonstrating *i-Ready*'s effectiveness for all students, Curriculum Associates contracted with HumRRO and Century Analytics to focus on how *i-Ready* serves striving learners and students from traditionally disadvantaged backgrounds.

This study examined the impact of *i-Ready* on reading and mathematics achievement for striving learners in elementary Grades 2–5 using data from the 2018–2019 school year, with additional analyses examining whether *i-Ready* had a differential impact on Black and Latino students. Striving learners were defined as students who placed Two or More Grade Levels Below their enrolled grade on the fall *i-Ready Diagnostic*. Students who are Two or More Grade Levels Below are not yet prepared for grade-level content and are considered to have unfinished learning.

HumRRO and Century Analytics designed this study to meet the required rigor of the What Works Clearinghouse (WWC) standards to achieve a rating of Meets WWC Group Design Standards with Reservations and to meet guidelines for a Level 2 (or Moderate) rating for the ESSA guidance for evidence-based research. The study uses a QED, establishes baseline equivalence between *i-Ready* students and the comparison group, includes baseline achievement as a covariate, and uses a sampling design that mitigates the effects of any confounding factors.

The results from this study provide evidence that *i-Ready* can be used as effective, supplemental instruction to support students who have unfinished grade-level learning.

Research Questions

HumRRO and Century Analytics evaluated the following three research questions for this study:

1. What is the impact of *i-Ready Personalized Instruction* on student achievement for striving learners compared to striving learners who do not use *i-Ready*?
2. Do striving learners who are Black experience similar impacts on achievement when using *i-Ready* compared to striving learners overall?
3. Do striving learners who are Latino experience similar impacts on achievement when using *i-Ready* compared to striving learners overall?

Methodology and Sample Description

HumRRO and Century Analytics created a matched treatment and comparison sample of students that met WWC standards of baseline equivalence using propensity-score–matching techniques. Baseline equivalence indicates that the *i-Ready* ("treatment") and comparison group students are similar across meaningful characteristics at the start of a study or use of a program.

HumRRO and Century Analytics identified treatment and comparison students in similar schools based on the following characteristics: percentage of historically marginalized students, percentage of students eligible for free and reduced-price lunch, and grade level. In this analysis, historically marginalized students included students who identified as Black, Asian or Pacific Islander, American Indian or Alaska Native, and two or more races. Students in the treatment and comparison groups were then matched according to their placement scores in the domains of each subject. The final analytic sample consisted of 122,548 students in the reading analysis and 103,350 students in the mathematics analysis. Across all schools included in the analysis, the average percentages of students receiving free and reduced-price lunch were 53% (reading analysis) and 52% (mathematics analysis), and the average percentages of historically marginalized students were 51% (reading analysis) and 49% (mathematics analysis). See Table 1 for student sample size by subject and grade level.

To be included in the **treatment group**, students must:	To be included in the **comparison group**, students must:
• **Have used *i-Ready Personalized Instruction*** for an average of at least 30 minutes a week for at least 18 weeks • Have placed Two Grade Levels Below their enrolled grade on the fall *i-Ready Diagnostic* of the 2018–2019 school year • Have a valid, non-rushed *i-Ready Diagnostic* score for the fall and spring of the 2018–2019 school year	• **Have not used *i-Ready Personalized Instruction*** during the 2018–2019 school year • Have placed Two Grade Levels Below their enrolled grade on the fall *i-Ready Diagnostic* of the 2018–2019 school year • Have a valid, non-rushed *i-Ready Diagnostic* score for the fall and spring of the 2018–2019 school year

Learn more about *i-Ready Personalized Instruction* and the *i-Ready Diagnostic* on page 10 of this research brief.

Table 1: Overall Student Sample by Subject and Grade Level

	Grade 2	Grade 3	Grade 4	Grade 5	All Grades
Reading					
i-Ready Students	11,464	14,965	12,397	22,448	**61,274**
Comparison Group	11,464	14,965	12,397	22,448	**61,274**
Total Students	**22,928**	**29,930**	**24,794**	**44,896**	**122,548**
Mathematics					
i-Ready Students	11,673	14,679	12,757	12,566	**51,675**
Comparison Group	11,673	14,679	12,757	12,566	**51,675**
Total Students	**23,346**	**29,358**	**25,514**	**25,132**	**103,350**

Analysis

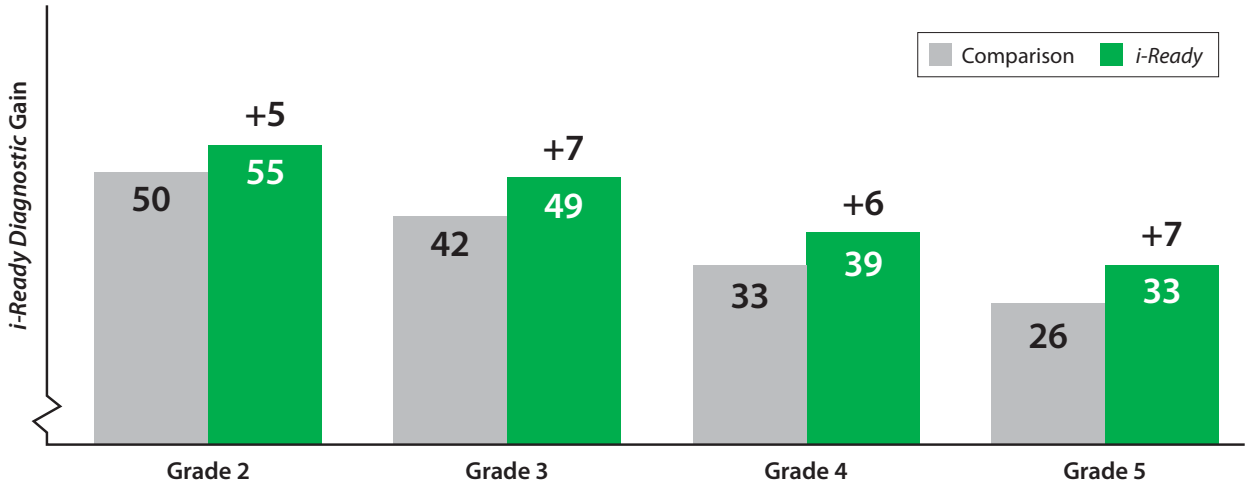
HumRRO and Century Analytics used hierarchical linear modeling (HLM) to estimate the impact of *i-Ready* on student achievement. HLM allows for additional school effects to be considered in the statistical model compared to a simple regression. In this statistical model, HumRRO and Century Analytics evaluated the impact of *i-Ready* on student achievement while controlling for the student's fall Diagnostic placement, school urbanicity, school percentage of students eligible for free and reduced-price lunch, school percentage of students of historically marginalized races, and school grade-level enrollment.

Additional exploratory analyses using these models analyzed whether Black and Latino striving learners experienced the same benefits from using *i-Ready*.

Results

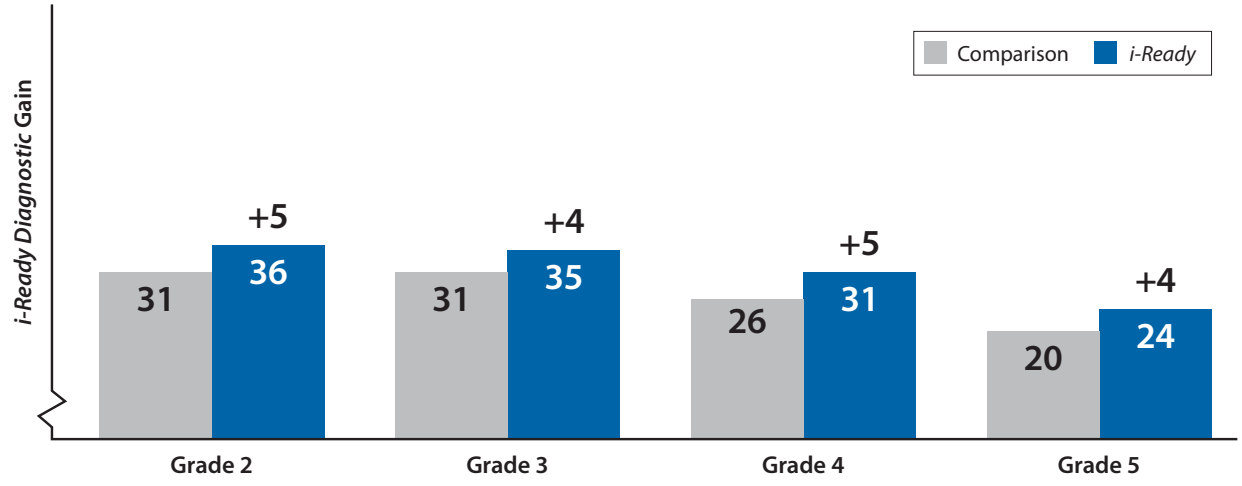
The researchers found that striving learners in Grades 2–5 using *i-Ready* scored statistically significantly higher on their spring Diagnostic compared to their peers who did not use *i-Ready* in reading or mathematics. See Graph 1 and Graph 2.

Graph 1: Impact of *i-Ready Personalized Instruction* in Reading on *i-Ready Diagnostic* Scores



Note: View Appendix Table 3 for detailed reading results.

Graph 2: Impact of *i-Ready Personalized Instruction* in Mathematics on *i-Ready Diagnostic* Scores



Note: View Appendix Table 4 for detailed mathematics results.

What Is an Effect Size?

How to Interpret Effect Sizes

An effect size is a quantitative measure of the magnitude of an experimental effect. In education research, effect size usually refers to the magnitude of the "treatment" or "intervention" program or practice on student or teacher outcomes.

Effect sizes range from 0 to 1 and are often categorized into "small," "medium," and "large" effects where the larger the effect size, the stronger the impact of the treatment or intervention. Research shows that effect sizes in experimental studies of typical education interventions range from .03 to .17 and suggests that an effect size of less than .05 can be considered small, an effect size of .05 to .20 can be considered medium, and an effect size greater than .20 can be considered large (Kraft, 2019). Based on this interpretation, the effect size for *i-Ready* in this particular study ranges from medium to large depending on the grade level and subject.

Translating Effect Sizes

In order to make the effect sizes more educationally meaningful, the subject and grade-level effect sizes were translated into the number of weeks of instruction as well as an improvement index. The number of weeks of instruction represents the number of additional weeks of instruction that *i-Ready* students gained over the comparison group based on the magnitude of the difference between the *i-Ready* students' score gains and the comparison group students' score gains. For example, an effect size of .12 for Grade 2 students in reading translates into five weeks of additional instruction or growth that a student using *i-Ready* would gain over a comparison group student. Note that the average amount of growth per grade and subject vary, so the same effect size can translate into a different number of weeks of instruction based on the subject and grade level.

To measure the strength of using *i-Ready Personalized Instruction* on the overall study sample, effect sizes were calculated. An effect size represents the magnitude of the difference in scores. In this case, the effect size represents the extent of the difference between the fall-to-spring gains of an average student in the *i-Ready* treatment group and an average student in the comparison group. The study authors found the effect sizes ranged from .12 to .14 in reading and from .13 to .22 in mathematics. See Table 2 below and Appendix Tables 3 and 4 for more details.

Table 2: Results for All Striving Learners for Reading and Mathematics in Grades 2–5

	Reading *i-Ready* versus Comparison Group Students		Mathematics *i-Ready* versus Comparison Group Students	
Grade	**Effect Size**	**# Weeks of Instruction**	**Effect Size**	**# Weeks of Instruction**
2	.12	5	.22	6
3	.14	7	.18	6
4	.12	8	.21	8
5	.12	9	.13	7

In addition, the researchers analyzed the data for students who were Black and Latino. This sub-analysis found that striving learners who are Black and Latino experienced the same positive impacts of *i-Ready*, on reading and mathematics achievement as striving learners overall. Furthermore, striving learners who are Black and used *i-Ready* performed significantly better than their Black peers who did not use *i-Ready*, and striving learners who are Latino who used *i-Ready* performed significantly better than their Latino peers who did not use *i-Ready*.

Conclusion

Findings from these analyses provide further evidence that *i-Ready* positively impacts striving learners in reading and mathematics, including students who are Black and Latino. Students using *i-Ready* who placed Two Grade Levels Below their enrolled grade experienced statistically significantly greater gains than students who did not use *i-Ready*. Results from this research provide evidence that students with unfinished learning who use *i-Ready* outperform their peers with unfinished learning who do not use *i-Ready*.

Appendix : Impact Analysis Results

Table 3: Results for All Striving Learners for Reading in Grades 2–5

		Schools	Students	Fall Diagnostic Mean	Spring Diagnostic Mean	Adjusted Mean Difference	*p*-value	Effect Size	# Weeks of Instruction
2	*i-Ready* Students	1,281	11,464	395	450	5	<.0001	.12	5
	Comparison Group	1,253	11,464	395	445				
3	*i-Ready* Students	1,443	14,965	434	482	6	<.0001	.14	7
	Comparison Group	1,404	14,965	434	476				
4	*i-Ready* Students	1,558	12,397	456	496	5	<.0001	.12	8
	Comparison Group	1,502	12,397	457	490				
5	*i-Ready* Students	1,716	22,448	499	532	6	<.0001	.12	9
	Comparison Group	1,682	22,448	499	526				

Table 4: Results for All Striving Learners for Mathematics in Grades 2–5

		Schools	Students	Fall Diagnostic Mean	Spring Diagnostic Mean	Adjusted Mean Difference	*p*-value	Effect Size	# Weeks of Instruction
2	*i-Ready* Students	1,309	9,114	368	405	5	<.0001	.22	6
	Comparison Group	1,283	9,121	368	400				
3	*i-Ready* Students	1,314	9,606	388	424	4	<.0001	.18	6
	Comparison Group	1,295	9,598	388	419				
4	*i-Ready* Students	1,427	10,068	408	439	6	<.0001	.21	8
	Comparison Group	1,351	10,031	408	434				
5	*i-Ready* Students	1,447	9,956	422	447	4	<.0001	.13	7
	Comparison Group	1,372	9,969	423	443				

Note: Means and adjusted mean differences on this page have been rounded to the nearest whole number.

Reference

Kraft, M. (2019). Interpreting effect sizes of education interventions. *EdWorkingPaper No. 19-10*. doi: 10.26300/8pjp-2z74.

Program Overview

i-Ready Personalized Instruction is an evidence-based program grounded in research for students in Grades K–8 with an individualized plan for instruction based on each student's performance on the online, adaptive *i-Ready 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. To learn more about the research base behind *i-Ready*, visit CurriculumAssociates.com/Research.

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. In addition, Curriculum Associates recommends administering the Diagnostic three times per year (i.e., beginning, middle, and end) with 12–18 weeks between each administration.

Outcome Measure

The Diagnostic is a computer-adaptive assessment that provides valid and reliable test scores for students in Grades K–12. The Diagnostic starts each student at a difficulty level based on an educated guess that is derived from their chronological grade level. As students answer questions correctly or incorrectly, the test adjusts up or down, with questions of varying difficulty, until the assessment reaches the level of difficulty that is "just right" for each student. The Diagnostic is usually administered at three time points during the school year: typically during fall, winter, and spring. Multiple studies have been conducted to support the reliability and validity of the Diagnostic for Reading and for Mathematics as well as their consistency with state content standards used across the United States. The Diagnostic received high ratings from the National Center on Intensive Intervention for use as an Academic Screening and Progress Monitoring tool for both Reading and Mathematics. To learn more about the Diagnostic, visit CurriculumAssociates.com/Diagnostic.

i-Ready

Built to address the rigor of the new standards, *i-Ready* helps students make real gains. *i-Ready* collects a broad spectrum of rich data on student abilities that identifies areas where a student needs support, measures growth across a student's career, supports teacher-led differentiated instruction, and provides a personalized instructional path within a single online solution.

To learn more about evidence on the impact of *i-Ready*, please visit CurriculumAssociates.com/Research.

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