



Impact of *i-Ready Personalized Instruction* Time and Lesson Pass Rates on Student Learning Gains

Curriculum Associates Research Brief | June 2021

Research Overview

This study examined fall to spring score gains on the *i-Ready Diagnostic* for groupings of students with differing levels of exposure to *i-Ready Personalized Instruction* ("*i-Ready*") and differing Lesson Quiz pass rates. Students with an average of 30–49 minutes of *i-Ready* per week who passed at least 70% of their Lesson Quizzes made greater gains than students with an average of less than 30 minutes of *i-Ready* per week who passed less than 70% of their Lesson Quizzes. The difference was positive and statistically significant. This study provides evidence that students in Grades K–8 who use *i-Ready* as recommended make greater improvements in reading and mathematics than students who do not use *i-Ready* as recommended.

Introduction

i-Ready Personalized Instruction lessons are sequenced to support students' strengths and areas for growth, and specific lessons can be assigned by educators when needed, to help every student reach grade-level proficiency. This research includes data for all lessons, whether from the personalized path or teacher assigned.

Many studies have demonstrated that students who use *i-Ready* showed greater fall to spring gains on the *i-Ready Diagnostic* assessment when compared to students who did not use *i-Ready*. The current study furthers that work by comparing students who differed in the average amount of *i-Ready* they received per week and their average pass rates across those lessons.

- Students who met the recommended guidance for *i-Ready* usage (30–49 minutes per week and passed at least 70% of their Lesson Quizzes) had gains that were statistically significantly higher than those of students who spent 10–29 minutes on average per week and passed fewer than 70% of their Lesson Quizzes.
- The study also found a statistically significant relationship between the gains of students who spent 50 or more minutes per week than students who spent 30–49 minutes per week when both groups had an average lesson pass rate of 70% or higher.
- It is important to note that exceeding the recommended guidance may be beneficial to some students, but it is not necessarily appropriate for all implementations.

Methodology

This research used a sample of students that received *i-Ready* during the 2017–2018 school year, categorized into four groups based on the average time spent on *i-Ready* each week and the percentage of Lesson Quizzes passed. Specifically:

Group 1	Group 2	Group 3	Group 4
<ul style="list-style-type: none">Spent 1–9 minutes on average per week on <i>i-Ready</i> during the 2017–2018 school year <i>and</i>Passed less than 70% of all Lesson Quizzes	<ul style="list-style-type: none">Spent 10–29 minutes on average per week on <i>i-Ready</i> during the 2017–2018 school year <i>and</i>Passed less than 70% of all Lesson Quizzes	<ul style="list-style-type: none">Spent 30–49 minutes on average per week on <i>i-Ready</i> during the 2017–2018 school year <i>and</i>Passed at least 70% of all Lesson Quizzes	<ul style="list-style-type: none">Spent at least 50 minutes on average per week on <i>i-Ready</i> during the 2017–2018 school year <i>and</i>Passed at least 70% of all Lesson Quizzes
Due to the small number of students in Group 1, results for that group were not included in this analysis.	Group 2 usage is below current recommended guidance. While 10–29 minutes may be an appropriate target for time spent, we recommend all students aim for a pass rate of at least 70%.	Group 3 meets current recommended guidance and is appropriate for most implementations.	Group 4 exceeds current recommended guidance and may be appropriate in some but not all implementations.

← Students in Groups 1 and 2 did not pass 70% of lessons. → Students in Groups 3 and 4 passed at least 70% of lessons.

To examine the impact of the average time a student receives *i-Ready* and the average lesson pass rate on students' gains on the *i-Ready Diagnostic* assessment, the Curriculum Associates Research team examined both the differences in the raw mean gain scores between fall and spring *i-Ready Diagnostic* assessment scores from the same school year (2017–2018) for each group. In addition, the team conducted a more rigorous analysis of covariance (ANCOVA) on the differences in score gains between groups to control for prior student achievement on baseline (i.e., fall) test scores in both reading and mathematics. Hedge's *g* was used to measure the effect size for the difference between the two group means. Due to the small number of students in Group 1 (see Appendix Tables 1 and 2), results for that group were not included in this analysis.

Sample Description

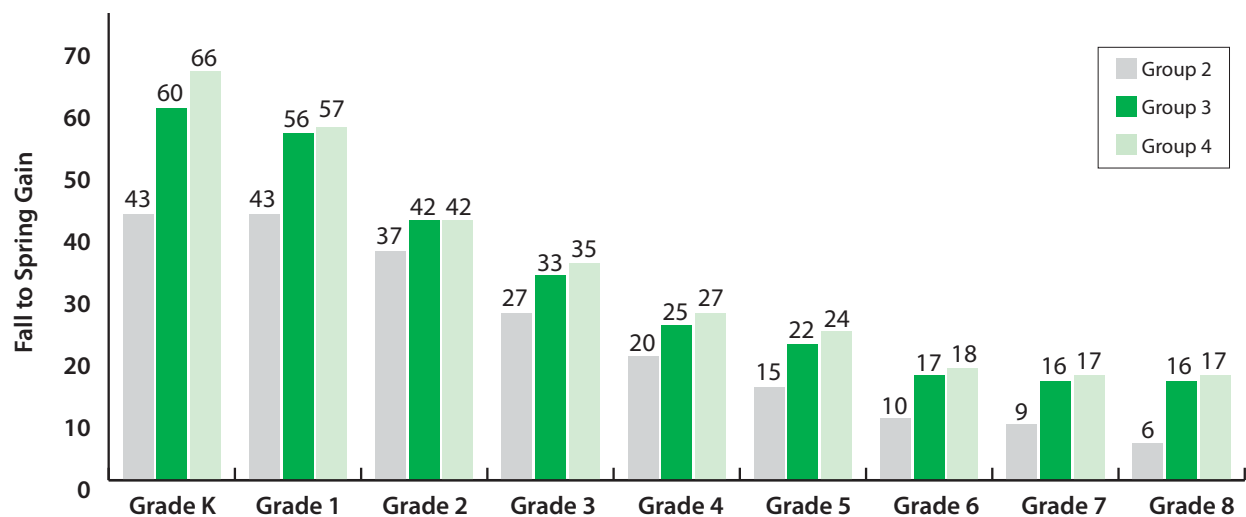
This study used *i-Ready Diagnostic* and Personalized Instruction data from the 2017–2018 school year that includes student performance on the *i-Ready Diagnostic* assessment as well as the time spent on *i-Ready* and the pass rate on Lesson Quizzes for both reading and mathematics. In order to ensure data quality, this dataset only includes the *i-Ready Diagnostic* assessments that were completed without rushing, students who were in the same grades within the same academic year, lessons that were fully completed, and lessons that were taken after the fall Diagnostic and before the spring Diagnostic. The overall analytic sample included 1,326,607 students in the reading analysis and 1,167,430 students in the mathematics analysis. See Appendix Tables 1 and 2 for sample size by subject, grade, and implementation group.

Results

To determine how the different groups of students performed on the *i-Ready Diagnostic* assessment over the course of an entire school year, we first examined the differences in gain scores for students in each grade for both reading and mathematics.

In reading, students who used *i-Ready* as recommended for an average of 30–49 minutes per week and passed, on average, at least 70% of Lesson Quizzes grew between 5 and 17 scale-score points higher on the *i-Ready Diagnostic* assessment than students who used *i-Ready* for 10–29 minutes and passed less than 70% of Lesson Quizzes. In addition, students who used *i-Ready* for an average of at least 50 minutes per week and passed, on average, at least 70% of Lesson Quizzes grew between 6 and 23 scale-score points higher on the *i-Ready Diagnostic* assessment compared to students who used *i-Ready* for 10–29 minutes, passed less than 70% of Lesson Quizzes, and grew 1 to 6 scale-score points higher than those who used *i-Ready* for an average of 30–49 minutes per week and passed, on average, at least 70% of Lesson Quizzes. See Graph 1.

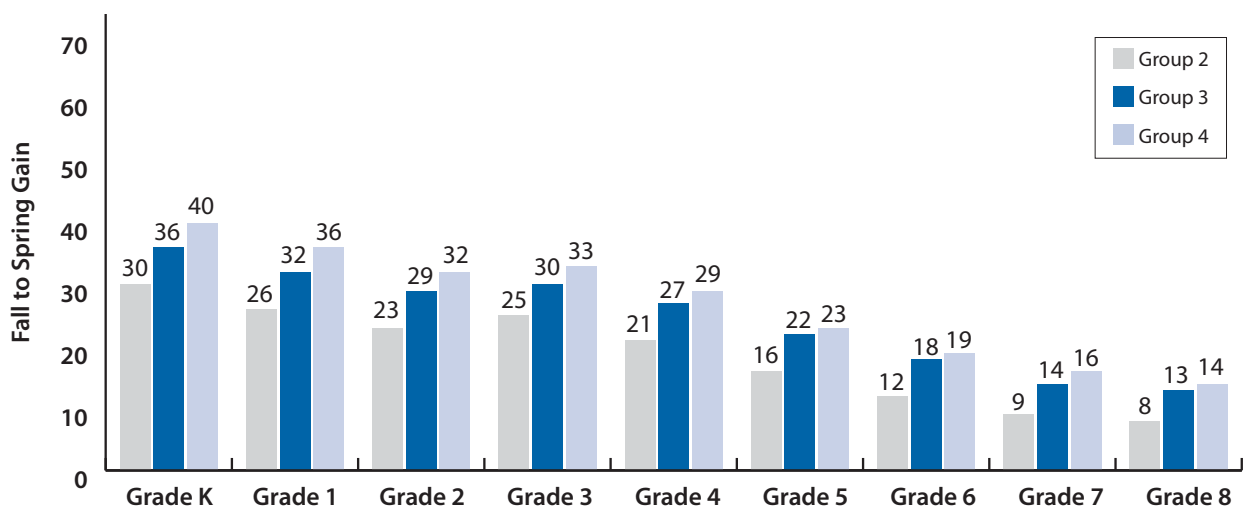
Graph 1. Comparison of Gain Scores from School Year 2017–2018 Fall to Spring *i-Ready Diagnostic* in Reading Based on *i-Ready* Usage Group



Grade	Group 2: 10–29 Minutes and Pass Rate <70%	Group 3: 30–49 Minutes and Pass Rate >70%	Group 4: 50+ Minutes and Pass Rate >70%	
	Gain Score	Gain Score	Gain Above Group 2	Gain Above Group 2
K	43	60	+17	+23
1	43	56	+13	+14
2	37	42	+5	+5
3	27	33	+6	+8
4	20	25	+5	+7
5	15	22	+7	+9
6	10	17	+7	+8
7	9	16	+7	+8
8	6	16	+12	+13

Similarly, in mathematics, students who used *i-Ready* as recommended for an average of 30–49 minutes per week and passed, on average, at least 70% of Lesson Quizzes grew between 5 and 6 scale-score points higher on the *i-Ready Diagnostic* assessment than students who used *i-Ready* for less than 30 minutes and passed less than 70% of Lesson Quizzes. In addition, students who used *i-Ready* for an average of at least 50 minutes per week and passed, on average, at least 70% of Lesson Quizzes grew between 6 and 10 scale-score points higher on the *i-Ready Diagnostic* assessment than students who used *i-Ready* for 10–29 minutes, passed less than 70% of Lesson Quizzes, and grew 1 to 4 scale-score points higher than those who used *i-Ready* for an average of 30–49 minutes per week and passed, on average, at least 70% of Lesson Quizzes. See Graph 2.

Graph 2: Comparison of Gain Scores from School Year 2017–2018 Fall to Spring *i-Ready Diagnostic* in Mathematics Based on *i-Ready* Usage Group



	Group 2: 10–29 Minutes and Pass Rate <70%	Group 3: 30–49 Minutes and Pass Rate >70%	Group 4: 50+ Minutes and Pass Rate >70%
Grade	Gain Score	Gain Score	Gain Above Group 2
K	30	36	+6
1	26	32	+6
2	23	29	+6
3	25	30	+5
4	21	27	+6
5	16	22	+6
6	12	18	+6
7	9	14	+5
8	8	13	+5

Similarly, results from the ANCOVA, which accounts for the prior fall scores and is a more rigorous test of change compared to simple raw gain scores, revealed statistically significant differences for both subjects and across all Grades K–8. Specifically:

- Students who used *i-Ready* as recommended for an average of 30–49 minutes per week and passed at least 70% of Lesson Quizzes had, on average, statistically significantly greater performance on the spring *i-Ready* Diagnostic assessment after controlling for their prior achievement on the fall *i-Ready* Diagnostic assessment—compared to those who used *i-Ready* for less than 10–29 minutes per week on average and passed less than 70% of their Lesson Quizzes.
- Students who used *i-Ready* for an average of 50 minutes per week or more and passed at least 70% of Lesson Quizzes had, on average, statistically significantly greater performance on the spring *i-Ready* Diagnostic assessment after controlling for their prior achievement on the fall *i-Ready* Diagnostic assessment—compared to students who used *i-Ready* for less than 10–29 minutes per week on average and passed less than 70% of their Lesson Quizzes.
- Students who used *i-Ready* for an average of 50 minutes per week or more and passed at least 70% of their Lesson Quizzes had, on average, statistically significantly greater performance on the spring *i-Ready* Diagnostic assessment after controlling for their prior achievement on the fall *i-Ready* Diagnostic assessment—compared to students who used *i-Ready* for 30–49 minutes per week on average and passed at least 70% of their Lesson Quizzes.

Limitations

This study is observational in nature, and inferences about the impact of the fidelity of *i-Ready* implementation on student learning gains are correlational and not causal. However, the results do show a positive relationship, and the Curriculum Associates Research team has more research underway to investigate the relationships among *i-Ready* usage and student learning gains. Additionally, in this research brief we translated the effect size into the number of weeks of additional instruction, which represents growth beyond that of a comparison group. Our hope is that this metric helps educators interpret what an effect size means in a classroom environment; however, we recognize that it may be challenging to interpret given that the same effect size can translate to a different amount of growth due to the varying amount of average growth for each combination of subject and grade level.

Conclusion

Findings from this study provide evidence that students who used *i-Ready* per the recommended guidance (i.e., 30–49 minutes on average per week with a lesson pass rate of 70%) had greater fall to spring gains than students who used *i-Ready* for 10–29 minutes per week with a lesson pass rate below the recommended 70% threshold. Students who went above the recommended guidance and used *i-Ready* for more than 50 minutes per week and passed 70% of their lessons experienced greater growth than students who met the recommended guidance. Further research should be conducted to better understand which students would benefit from additional Lesson Time-on-Task and which students should continue to use *i-Ready* according to current recommended guidelines.

Appendix

Table 1. Sample Size for Reading

	K	1	2	3	4	5	6	7	8
Group 1: 1–9 Minutes and Pass Rate <70%	16	69	76	65	165	219	197	157	112
Group 2: 10–29 Minutes and Pass Rate <70%	16,952	8,952	5,164	3,614	3,866	4,824	3,476	2,780	2,122
Group 3: 30–49 Minutes and Pass Rate >70%	44,331	103,010	115,204	91,142	78,158	70,592	44,621	25,404	17,834
Group 4: 50+ Minutes and Pass Rate <70%	30,228	88,657	128,290	127,727	99,024	85,527	58,227	37,452	28,353

Table 2. Sample Size for Mathematics

	K	1	2	3	4	5	6	7	8
Group 1: 1–9 Minutes and Pass Rate <70%	1	2	3	15	20	26	12	17	10
Group 2: 10–29 Minutes and Pass Rate <70%	11,391	3,690	2,993	6,260	9,958	9,251	6,851	5,601	3,298
Group 3: 30–49 Minutes and Pass Rate >70%	54,289	117,869	138,020	127,229	80,765	55,434	32,712	21,761	13,829
Group 4: 50+ Minutes and Pass Rate >70%	20,655	58,681	83,657	92,035	59,504	50,909	42,789	34,068	23,825

Table 3. Average Gain Scores from Fall to Spring on *i-Ready Diagnostic* for Reading

Grade	Group 2: 10–29 Minutes and Pass Rate <70%			Group 3: 30–49 Minutes and Pass Rate >70%			Group 4: 50+ Minutes and Pass Rate >70%		
	<i>n</i>	Mean	Standard Deviation	<i>n</i>	Mean	Standard Deviation	<i>n</i>	Mean	Standard Deviation
K	16,952	42.97	29.39	44,331	60.45	30.66	30,228	66.24	32.40
1	8,952	43.16	33.66	103,010	55.74	30.77	88,657	57.19	31.05
2	5,164	37.15	35.46	115,204	42.34	29.60	128,290	42.15	29.22
3	3,614	27.49	32.87	91,142	33.46	29.90	127,727	35.08	30.08
4	3,866	19.65	33.17	78,158	25.28	30.11	99,024	27.14	29.95
5	4,824	15.33	34.36	70,592	22.06	30.42	85,527	24.35	30.87
6	3,476	10.17	36.91	44,621	16.80	31.64	58,227	17.80	33.35
7	2,780	8.51	40.01	25,404	16.02	35.94	37,452	16.81	36.77
8	2,122	6.20	42.83	17,834	16.25	37.91	28,353	17.39	38.15

Note: *i-Ready Diagnostic* is vertically scaled across Grades K–12. As with other vertically scaled assessments, gain scores across grades are not comparable and are smaller at higher grade levels.

Table 4. Average Gain Scores from Fall to Spring on *i-Ready Diagnostic* for Mathematics

Grade	Group 2: 10–29 Minutes and Pass Rate <70%			Group 3: 30–49 Minutes and Pass Rate >70%			Group 4: 50+ Minutes and Pass Rate >70%		
	<i>n</i>	Mean	Standard Deviation	<i>n</i>	Mean	Standard Deviation	<i>n</i>	Mean	Standard Deviation
K	11,391	30.23	19.90	54,289	35.54	19.08	20,655	40.27	21.32
1	3,690	25.51	20.79	117,869	32.43	17.91	58,681	35.74	18.90
2	2,993	22.95	19.85	138,020	29.22	17.10	83,657	32.12	17.77
3	6,260	24.62	18.19	127,229	30.35	17.42	92,035	32.65	18.26
4	9,958	21.15	17.54	80,765	27.38	18.59	59,504	29.38	19.44
5	9,251	15.90	17.85	55,434	21.57	18.88	50,909	23.29	18.93
6	6,851	12.23	19.32	32,712	17.80	19.50	42,789	18.58	19.68
7	5,601	8.78	19.84	21,761	14.38	21.76	34,068	15.84	21.66
8	3,298	7.99	21.05	13,829	12.87	23.44	23,825	14.44	22.81

Note: *i-Ready Diagnostic* is vertically scaled across Grades K–12. As with other vertically scaled assessments, gain scores across grades are not comparable and are smaller at higher grade levels.

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. See Appendix for more details.

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.

Table 5. Group 2 (10–29 Minutes and Pass Rate <70%) versus Group 3 (30–49 Minutes and Pass Rate >70%)

Grade	Reading		Mathematics	
	Effect Size	# Weeks of Instruction	Effect Size	# Weeks of Instruction
K	.74	15	.54	12
1	.42	11	.48	12
2	.31	12	.33	10
3	.17	9	.22	7
4	.14	10	.19	7
5	.14	11	.17	9
6	.15	16	.14	10
7	.15	17	.13	12
8	.18	25	.12	13

Note: For example, the effect size of using *i-Ready*, on average, for 30–49 minutes per week and had a lesson pass rate of 70% or higher in Grade 3 Reading was .17, which translates to 13 weeks of instruction or growth beyond that of using *i-Ready*, on average, for 10–29 minutes and having a lesson pass rate lower than 70%.

Table 6. Group 2 (10–29 Minutes and Pass Rate <70%) versus Group 4 (50+ Minutes and Pass Rate >70%)

Grade	Reading		Mathematics	
	Effect Size	# Weeks of Instruction	Effect Size	# Weeks of Instruction
K	.92	19	.75	16
1	.48	13	.60	15
2	.35	14	.46	14
3	.22	12	.30	9
4	.18	12	.25	10
5	.19	15	.23	12
6	.16	18	.17	12
7	.18	21	.18	17
8	.23	32	.17	19

Note: For example, the effect size of using *i-Ready*, on average, for 50 minutes or more per week and had a lesson pass rate of 70% or higher in Grade 3 Reading was .22, which translates to 16 weeks of instruction or growth beyond that of using *i-Ready*, on average, for 10–29 minutes and having a lesson pass rate lower than 70%.

Table 7. Group 3 (30–49 Minutes and Pass Rate >70%) versus Group 4 (50+ Minutes and Pass Rate >70%)

Grade	Reading		Mathematics	
	Effect Size	# Weeks of Instruction	Effect Size	# Weeks of Instruction
K	.18	4	.24	5
1	.05	1	.16	4
2	.03	1	.13	4
3	.04	2	.08	2
4	.04	3	.06	2
5	.04	3	.06	3
6	.01	4	.02	1
7	.03	4	.04	4
8	.04	6	.05	6

Note: For example, the effect size of using *i-Ready*, on average, for 50 minutes or more per week and had a lesson pass rate of 70% or higher in Grade 3 Reading was .04, which translates to three weeks of instruction or growth beyond that of using *i-Ready*, on average, for 30–49 minutes and having a lesson pass rate of 70% or higher.

Reference

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



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.

