

Reading Progress in Fresno Unified School District (2023-24)

Study Type: ESSA Level II

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Executive Summary

Microsoft contracted with LearnPlatform by Instructure, a third-party edtech research company, to conduct a series of studies examining the impact of Reading Progress on student reading achievement in Fresno Unified School District (FUSD). This full year report is the third of the three studies and summarizes the impact of Reading Progress usage during the 2023-24 school year for students in kindergarten through grade 6. LearnPlatform by Instructure designed this study to satisfy Level II requirements (*Moderate Evidence*) of the Every Student Succeeds Act (ESSA).

Study Sample and Measures

This quasi-experimental study took place in FUSD, a large, urban preK-12 district in California. The study included an analysis sample of 5,828 students in kindergarten through grade 6 (i.e., 2,914 treatment and 2,914 comparison students). Students in both groups had comparable fall i-Ready scores and demographics. Roughly two-thirds of the sample was Hispanic (70%) and 50% identified as female. Additionally, most students (79%) qualified for free/reduced price lunch.

Researchers included Reading Progress usage data, beginning and end-of-year i-Ready reading assessment results, and student demographics in the present study. Researchers conducted descriptive statistics to examine participant characteristics and program implementation. Additionally, researchers used propensity score matching to identify the analytic sample and conducted multilevel analyses that accounted for clustering of students in schools to model the impact of Reading Progress on student reading achievement.

Implementation

A total of 2,914 students in the district (9% of K-6 students) used Reading Progress during the 2023-24 school year. On average, K-2 students who used Reading Progress submitted 30 assignments and read an average of 96 words per assignment; grade 3-6 students submitted 18 assignments and read an average of 238 words per assignment. Most Reading Progress users (76% of K-2 student users and 88% of grade 3-6 student users) submitted fewer than five assignments per month.

Implementation fidelity. Based on the observed trends in Reading Progress usage throughout the school year, researchers set an implementation fidelity threshold of four assignments per month for K-2 students and five assignments per month for grade 3-6 users. For the impact analysis of this subgroup, the sample of K-2 Reading Progress users that met fidelity included 252 students (40% of all users in the grade band) and the grade 3-6 sample included 450 students (15% of all users in the grade band).

Student Outcomes

Relationship between Reading Progress usage levels and performance metrics. K-2 Reading Progress users who submitted more than 118 assignments (about 13 per month) had 13% higher accuracy and read an average of ten more words per minute (WPM) compared to peers who completed fewer assignments. Among grade 3-6 Reading Progress users, those who submitted

39-131 assignments (at least four per month) had 4% higher reading assignment accuracy and read an average of six more WPM than users who submitted fewer assignments.

Comparison of student outcomes between Reading Progress users and non-users. There was a positive, statistically significant effect of Reading Progress on i-Ready Reading gains among K-2 and grade 3-6 students, such that students who used Reading Progress experienced greater gains than similar students who did not use the program. The effect of Reading Progress was of greater magnitude among students who met the implementation fidelity threshold. Researchers also conducted exploratory subgroup analyses, finding that Reading Progress had a significant, positive effect among K-6 students who qualified for free/reduced price lunch.

ESSA Alignment

Given positive outcome findings, this study meets ESSA evidence requirements for Level II (*Moderate Evidence*). Specifically, this quasi-experimental study was properly designed and implemented; documented baseline equivalence; included statistical controls; had more than 350 students across multiple schools; and had multiple positive, statistically significant findings.

ESSA Level II Study Key Takeaways



Among K-6 students who used Reading Progress, those who submitted more assignments were more accurate and efficient readers.

- ✓ K-2 students who submitted more than 118 assignments were 13% more accurate and read an average of ten more WPM than peers who submitted fewer assignments.
- ✓ Grade 3-6 students who submitted 39-131 assignments were 4% more accurate and read an average of six more WPM than peers who submitted fewer assignments.



Students who used Reading Progress had significantly higher gains on i-Ready Reading scores from beginning to end of year than similar students who did not.

- ✓ If a K-2 student with gains in the 50th percentile had used Reading Progress with fidelity, they would have been expected to experience gains at the 63rd percentile.
- ✓ If a grade 3-6 student with gains in the 50th percentile had used Reading Progress with fidelity, they would have been expected to experience gains at the 56th percentile.



The impact of Reading Progress on end-of-year reading achievement was larger among students who met the implementation fidelity threshold.

- ✓ If a K-2 student with gains in the 50th percentile had used Reading Progress with fidelity (i.e., submitted at least four assignments per month), they would have been expected to experience gains at the 63rd percentile.
- ✓ If a grade 3-6 student with gains in the 50th percentile had used Reading Progress with fidelity (i.e., submitted at least five assignments per month), they would have been expected to experience gains at the 56th percentile.

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Introduction

Microsoft contracted with LearnPlatform by Instructure, a third-party edtech research company, to conduct a series of studies examining the impact of Reading Progress on kindergarten through grade 6 reading achievement in Fresno Unified School District (FUSD) in Fresno, California. This full year report is the third of the three studies and summarizes the impact of Reading Progress usage among K-6 students during the 2023-24 school year. LearnPlatform by Instructure designed this study to satisfy Level II requirements (*Moderate Evidence*) of the Every Student Succeeds Act (ESSA).

Navigating the time constraints imposed by traditional one-on-one fluency assessments while managing a class full of students with diverse needs, including English language learners and students with disabilities, is a persistent challenge. Microsoft's Reading Progress and Reading Coach support reading fluency instruction. The tools save teachers time and energy through automated, asynchronous fluency assessment data collection; AI-assisted data analysis; and on-demand education insights that help visualize class and student-level performance and growth. This allows educators to spend less time conducting fluency assessments and increase capacity for providing differentiated instruction and asset-based coaching. Reading Progress also gives students greater opportunity to develop requisite reading skills (see logic model in Appendix A; Hunt, Cavanaugh, & Long, 2023).

The study addressed the following research questions:

Implementation

1. To what extent did K-6 students use Reading Progress to practice oral reading fluency during the 2023-24 school year?

Student Outcomes

2. Was there a relationship between the level of Reading Progress usage and K-6 student scores on internal Reading Progress performance metrics?
3. Did K-6 students who used Reading Progress experience greater gains on i-Ready Reading than students who did not?
 - a. Did the impact of Reading Progress vary by student subgroup?

This report details the study design and methods, implementation, findings, and conclusions.

Study Design and Methods

This section briefly describes the study participants, measures, and analysis methods. Additional information on the study design, demographics, and measures are included in Appendix B.

Study Design, Participants, and Setting

This study used a quasi-experimental design¹ and a matched analytic sample² to align with ESSA Level II evidence standards. The treatment group included students in kindergarten through grade 6 who used Reading Progress with fidelity during the 2023-24 school year. The comparison group included demographically similar students with comparable fall 2023 i-Ready Reading scale scores who did not use Reading Progress. The final, matched analysis sample included 5,828 students (2,914 treatment and 2,914 comparison students) from 71 schools in FUSD.

Approximately two-thirds of the student sample was Hispanic (70%) and 50% identified as female. Additionally, most students (79%) qualified for free/reduced price lunch, and 20% were categorized as English language learners.

Measures

Researchers used Reading Progress platform usage and performance metrics, i-Ready Reading scale scores (fall 2023 and spring 2024), and demographics from administrative records as study measures. The participating district leveraged the Open Education Analytics (OEA) schema and platform (Azure Synapse and Datalake) to anonymize and share study data.

Data Analysis

Researchers used descriptive statistics to describe implementation and student characteristics. Researchers then conducted multilevel models to examine (a) the relationship between Reading Progress usage levels and internal performance metrics and (b) the impact of Reading Progress on student outcomes using a standardized assessment. All models included student-level demographic and prior achievement covariates to account for potential selection bias and tested for statistical significance at $p < .05$, which indicates a 95% probability that the observed relationship is not due to chance.

Researchers used standardized Hedges' g effect size (Hedges, 1981) to characterize the practical importance of statistically significant effects, which typically range from -2 through +2. In terms of educational interventions, a Hedges' g value of 0.05 indicates a small effect, while a value of 0.20 indicates a moderate effect. A value of 0.50 or above is considered a large effect (Kraft, 2020). Researchers translated Hedges' g effect sizes into percentile point differences using the WWC Improvement Index (WWC, 2022).

¹ A quasi-experimental design compares the outcomes of Reading Progress users to non-users.

² Researchers used nearest neighbor propensity score matching to identify a comparison group with similar prior performance and demographic characteristics. Additional information can be found in Appendix B.

Baseline equivalence. To ensure the validity of study results, researchers conducted baseline equivalence tests on matched treatment and comparison student samples. These findings are discussed in the Student Outcomes section and referenced in Appendix B. All analyses met What Works Clearinghouse 5.0 (WWC, 2022) baseline equivalence standards.

Implementation



To what extent did K-6 students use Reading Progress to practice oral reading fluency during the 2023-24 school year?

Researchers determined student usage based on the number of assignments submitted and words read in Reading Progress (see Table 1). Of the 30,999 K-6 students in the district, 9% ($n = 2,914$) used Reading Progress during the 2023-24 school year (i.e., between August 2023 and April 2024).

Overall, K-2 students who used Reading Progress submitted an average of 30 assignments total (or eight assignments per month. On average, K-2 students read 96 words per assignment (range 6-477). Students in grades 3-6 who used Reading Progress submitted an average of 18 assignments (or five assignments per month). On average, grade 3-6 students read 238 words per assignment (range 1-1,010).

Table 1. Summary of 2023-24 school year Reading Progress student usage

	Kindergarten-Grade 2 ($n = 622$)		Grade 3-6 ($n = 2,292$)		Kindergarten-Grade 6 ($n = 2,914$)	
	Average	Range	Average	Range	Average	Range
Usage metrics						
Total assignments submitted	30	1-300	18	1-313	21	1-313
Total words read	1,646	0-38,607	2,297	0-184,205	2,159	0-184,205
Average words per assignment	96	6-477	238	1-1,010	208	1-1,010
Average assignments per month	8	1-62	5	1-84	6	1-84
Performance metrics						
Average words per minute	31	0-122	69	0-182	61	0-182
Average assignment accuracy	40%	0-100%	58%	0-98%	54%	0-100%

Researchers also reported on two internal Reading Progress performance metrics: the number of words read per minute and percentage of words read accurately. K-2 Reading Progress students read an average of 31 WPM (range = 0-122). The average accuracy score across kindergarten through grade 2 student assignments was 40% (range = 0-100%). Grade 3-6 Reading Progress students read an average of 69 words per minute (range = 0-182). The average accuracy score across grade 3-6 student assignments was 58% (range = 0-98%; see Appendix B for monthly Reading Progress usage and performance metrics for August 2023-April 2024).

Reading Progress usage levels. Researchers used *k*-means cluster analyses to create usage groups based on the number of assignments students submitted during the 2023-24 school year. (i.e., low, medium, and high usage; see Figures 1 and 3).

K-2 Reading Progress usage groups. Among K-2 Reading Progress users, 76% ($n = 473$) were in the low usage group, which included students who submitted fewer than 42 assignments (an average of four assignments per month; $SD = 3.94$, range = 1-38). Approximately 17% ($n = 108$) fell in the medium usage group, which included students who submitted between 42 and 118 assignments (an average of 16 assignments per month; $SD = 6.52$, range = 7-34). The remaining 7% ($n = 41$) were in the high usage group and submitted more than 118 assignments (an average of 26 assignments per month; $SD = 9.58$, range = 16-62).

Most K-2 students who used Reading Progress during the 2023-24 school year submitted four or fewer assignments per month.

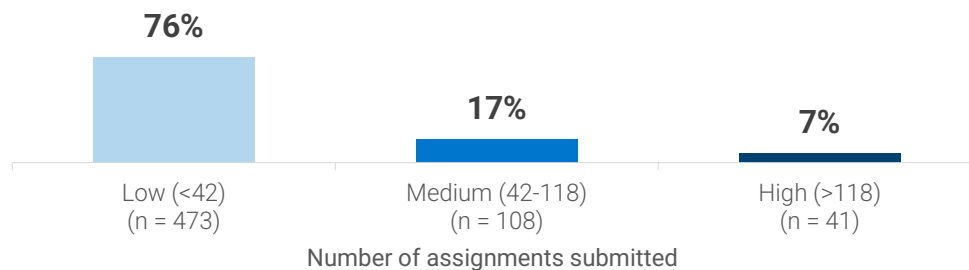


Figure 1. Reading Progress usage groups, K-2 ($n = 622$)

To provide additional context about Reading Progress implementation year in K-2 classrooms, researchers reviewed usage by semester (see Figure 2). A total of 430 K-2 students used Reading Progress during the fall. Students in the low usage group submitted an average of four assignments per month, while those in the medium usage group submitted an average of 13 assignments per month and those in the high usage group submitted 23 assignments per month.

On average, K-2 Reading Progress users submitted more assignments during the spring semester.

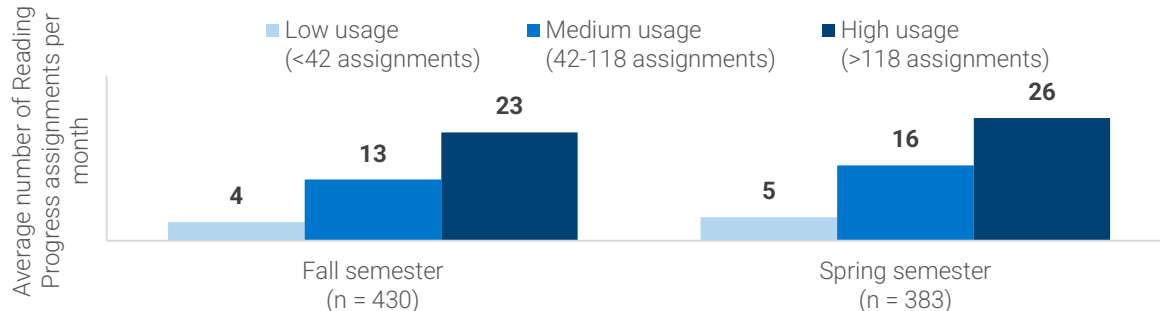


Figure 2. Average number of Reading Progress assignments submitted per month by semester and K-2 usage group ($n = 622$)

Although fewer K-2 students used Reading Progress during the spring semester ($n = 383$), average monthly usage was slightly higher. Those in the low usage group submitted an average of five assignments per month, the medium group submitted an average of 16 assignments per month. Finally, students in the high usage group submitted an average of 26 assignments. Of the 622 K-2 students who used Reading Progress during the 2023-24 school year, 31% ($n = 191$) had usage spanning both the fall and spring semesters.

Grade 3-6 Reading Progress usage groups. Among grade 3-6 Reading Progress users, 88% ($n = 2,109$) were in the low usage group, which included students who submitted fewer than 39 assignments (an average of four assignments per month; $SD = 3.22$, range = 1-25). Approximately 10% ($n = 227$) fell in the medium usage group, which included students who submitted between 39 and 131 assignments (an average of 14 assignments per month; $SD = 9.20$, range = 5-52). The remaining 2% ($n = 46$) were in the high usage group and submitted more than 131 assignments (an average of 33 assignments per month; $SD = 14.27$, range = 18-84).

Most grade 3-6 students who used Reading Progress during the 2023-24 school year submitted fewer than 5 assignments per month.

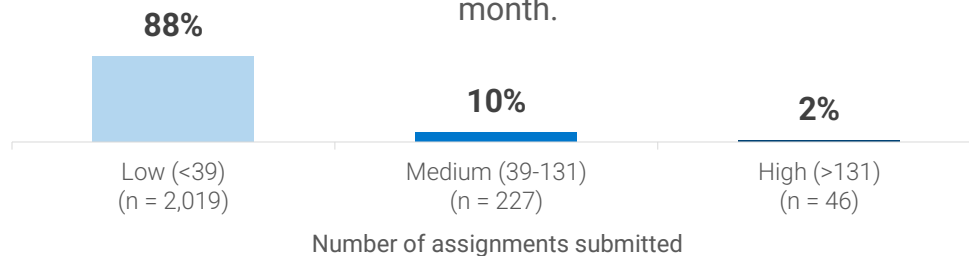


Figure 3. Reading Progress usage groups, grade 3-6 ($n = 2,292$)

Researchers also reviewed usage by semester (see Figure 4). A total of 1,815 grade 3-6 students used Reading Progress during the fall. Students in the low usage group submitted an average of three assignments per month, while those in the medium usage group submitted an average of 12 assignments. Those in the high usage group submitted 29 assignments per month.

On average, grade 3-6 Reading Progress users submitted more assignments during the spring semester.

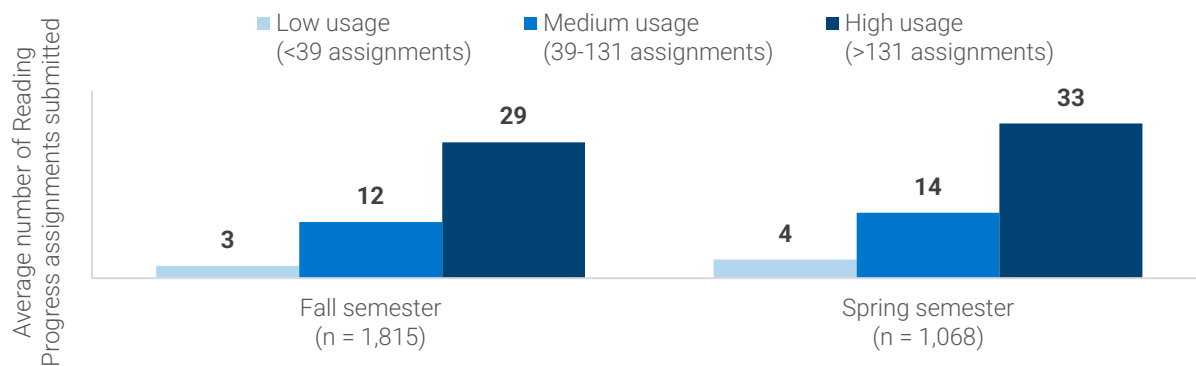


Figure 4. Average number of Reading Progress assignments submitted per month by usage group ($n = 2,292$)

Once again, fewer students used Reading Progress during the spring semester ($n = 1,068$), and average monthly usage was slightly higher. Those in the low usage group submitted an average of four assignments per month, and the medium group submitted an average of 14 assignments per month. Finally, students in the high usage group submitted an average of 33 assignments per month. Of the 2,292 grade 3-6 students who used Reading Progress during the 2023-24 school year, 26% ($n = 591$) had usage spanning both the fall and spring semesters.

Reading Progress implementation fidelity threshold. Based on review of Reading Progress usage data from the 2023-24 school year and input from FUSD educators supporting implementation, researchers identified a fidelity threshold.

Given the observed trends in usage throughout the year, the fidelity threshold was determined based on two criteria: 1) students must have used Reading Progress during the spring semester; and 2) students must have completed a certain number of assignments per month (more than four for students in kindergarten-grade 2, more than five for students in grades 3-6). These criteria identified 252 K-2 students for inclusion in impact analyses (40% of Reading Progress users in the grade band) and 450 grade 3-6 students (20% of Reading Progress users in the grade band).

Student Outcomes

The following section details (a) the influence of different levels of usage on student reading among Reading Progress users and (b) comparison of 2023-24 reading achievement gains between Reading Progress users and non-users. To analyze student outcomes, researchers first conducted multilevel models using Reading Progress students only, examining the influence of different usage levels on Reading Progress performance metrics (i.e., accuracy and WPM). Next, researchers conducted multilevel models on matched samples of Reading Progress users and non-users with comparable beginning of year reading achievement and demographics.

Researchers report statistically significant findings at the $p < .05$ level. Significant findings are marked green with an asterisk in Figures.



Was there a relationship between the level of Reading Progress usage and K-6 student scores on internal Reading Progress performance metrics?

Researchers first examined the influence of different levels of Reading Progress usage on internal performance metrics (i.e., accuracy & WPM) using multilevel models that controlled for fall reading achievement (see Appendix C for model results).

K-2 students. There was a statistically significant relationship between usage level and average assignment accuracy among K-2 students. On average, students who submitted more than 118 assignments during the school year were more accurate readers (53%, $SE = 5.12$) compared to students who submitted fewer than 42 assignments (46%, $SE = 0.84$), translating to an effect size of $g = 0.46$ (see Figure 5). The differences between the other two usage groups were not significant (see Appendix C for model results).

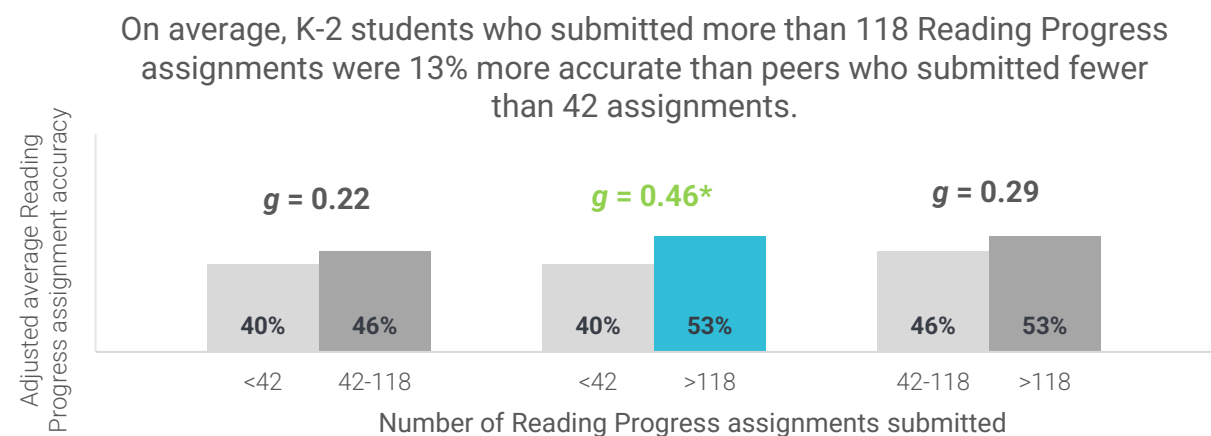


Figure 5. Comparison of K-2 student Reading Progress assignment accuracy by usage group ($n = 622$)

There was also a statistically significant relationship between usage level and average WPM among K-2 students. On average, students who submitted more than 118 assignments read more words per minute ($M = 42$, $SE = 4.7$) compared to students who submitted fewer than 42

assignments ($M = 32, SE = 2.7$), translating to an effect size of $g = 0.39$ (see Figure 6). The differences between the other two usage groups were not significant.

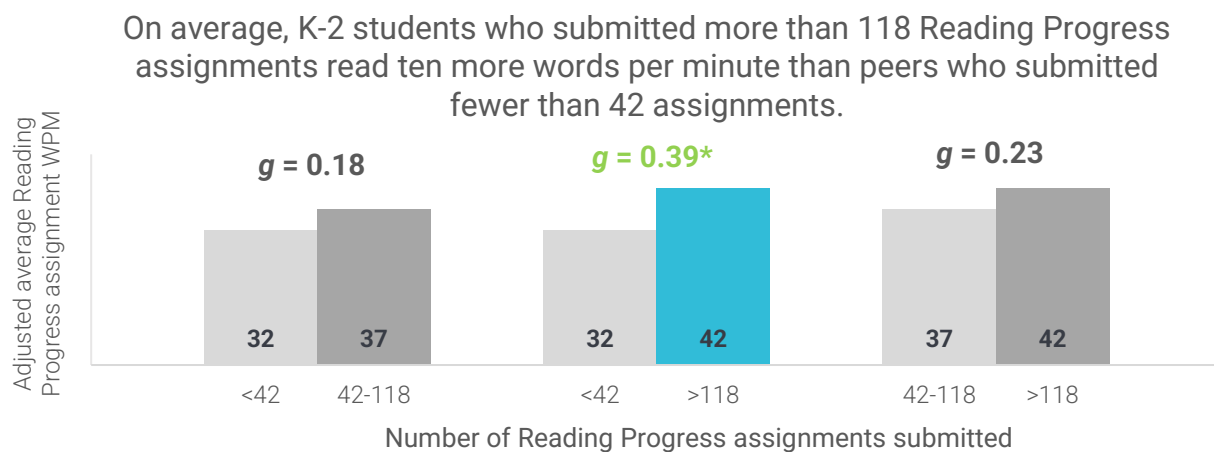


Figure 6. Comparison of K-2 student Reading Progress assignment accuracy by usage group ($n = 622$)

Grade 3-6 students. There was a statistically significant relationship between usage level and average assignment accuracy scores among grade 3-6 students. On average, students who submitted 39-131 assignments were more accurate readers (61%, $SE = 2.0$) compared to students who submitted fewer than 39 assignments (57%, $SE = 1.4$), translating to an effect size of $g = 0.18$ (see Figure 7). Differences between the other two usage groups were not significant.

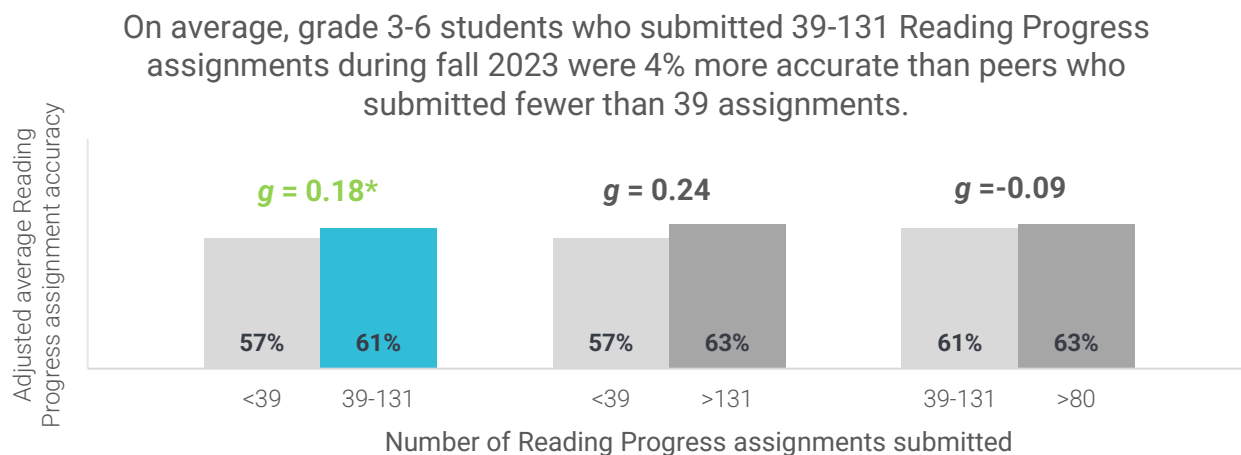


Figure 7. Comparison of grade 3-6 student Reading Progress assignment accuracy by usage group ($n = 2,292$)

There was also a statistically significant relationship between usage level and average assignment WPM among grade 3-6 students. On average, students who submitted 39-131 assignments had significantly higher WPM ($M = 73, SE = 2.5$) compared to students who submitted fewer than 39 assignments ($M = 67, SE = 1.6$), translating to an effect size of $g = 0.17$ (see Figure 8). The differences between the other two usage groups were not significant (see Appendix C for model results).

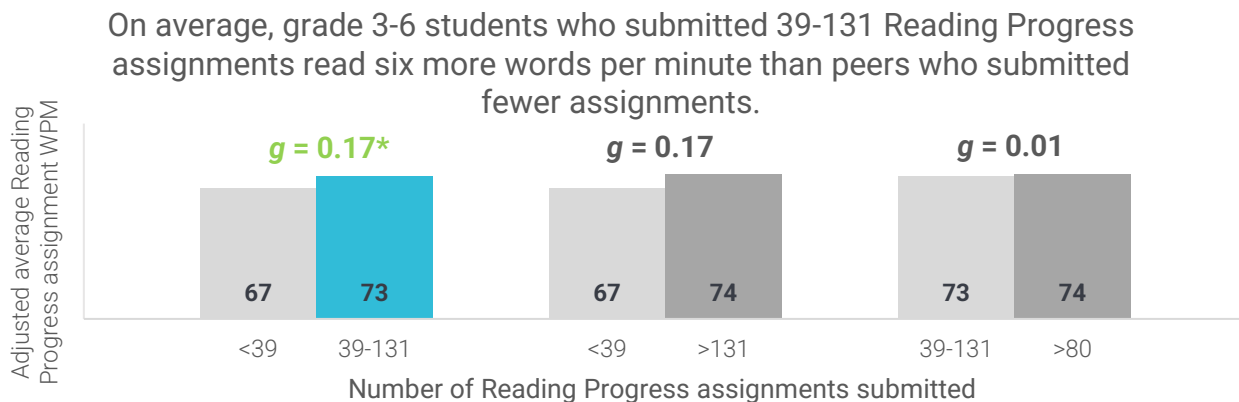


Figure 8. Comparison of grade 3-6 student Reading Progress assignment accuracy by usage group (n = 2,292)



Did K-6 students who used Reading Progress experience greater gains on i-Ready Reading than students who did not?

Researchers conducted multilevel models to examine the impact of Reading Progress on 2023-24 i-Ready Reading gains while also controlling for grade level and race (see Appendix C for full model results). Researchers used propensity score matching to ensure the intervention and comparison groups with similar beginning of year i-Ready Reading scores and demographic characteristics. As reported in Table B6 of Appendix B, groups were equivalent ($g < 0.25$) on all available metrics besides their usage of Reading Progress for all impact analyses.

Full implementation sample. Overall, results indicated a significant, positive effect of Reading Progress among K-2 students, translating to an effect size of $g = 0.18$. In other words, if a student who experienced gains at the 50th percentile had used Reading Progress, they would be expected to experience gains at the 57th percentile. Furthermore, results indicated a significant, positive effect of Reading Progress among students in grades 3-6, translating to an effect size of $g = 0.09$. In other words, if a student who experienced gains at the 50th percentile had used Reading Progress, they would be expected to experience gains at the 54th percentile (see Figure 9).

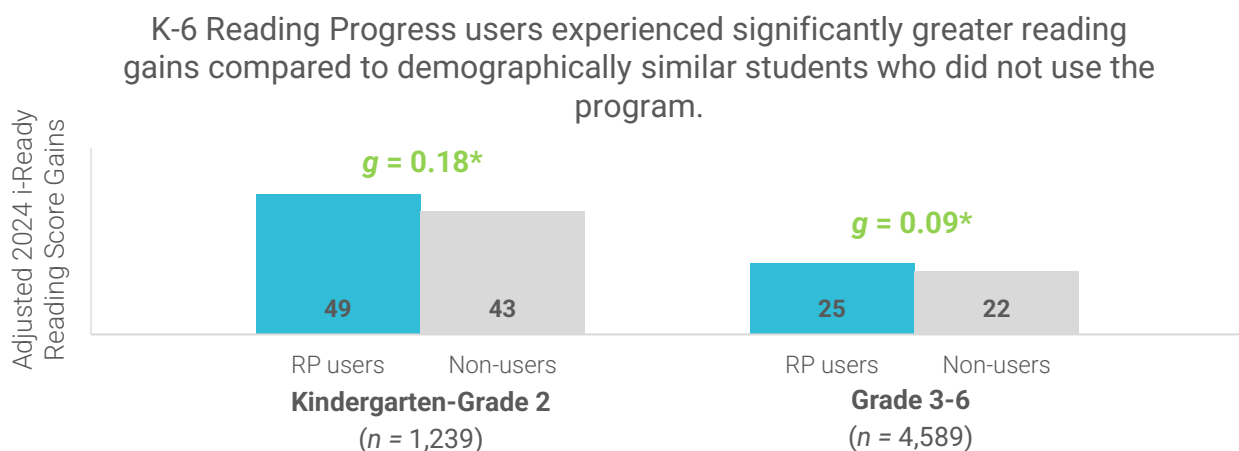


Figure 9. Comparison of i-Ready reading gains between K-6 students who did and did not use Reading Progress

Students who met implementation fidelity threshold. Additional analyses investigated whether consistent usage of Reading Progress (i.e., K-2 students who submitted more than four assignments per month; grade 3-6 students who submitted more than five assignments per month) had a greater impact on i-Ready Reading gains. Results indicated a significant, positive effect of Reading Progress among K-2 students, translating to an effect size of $g = 0.32$. **In other words, if a student with gains at the 50th percentile had used Reading Progress with fidelity, they would be expected to experience gains at the 63rd percentile.** Furthermore, results indicated a significant, positive effect of Reading Progress among students in grades 3-6, translating to an effect size of $g = 0.15$. **In other words, if a student who experienced gains at the 50th percentile had used Reading Progress with fidelity, they would be expected to experience gains at the 56th percentile (see Figure 10).**

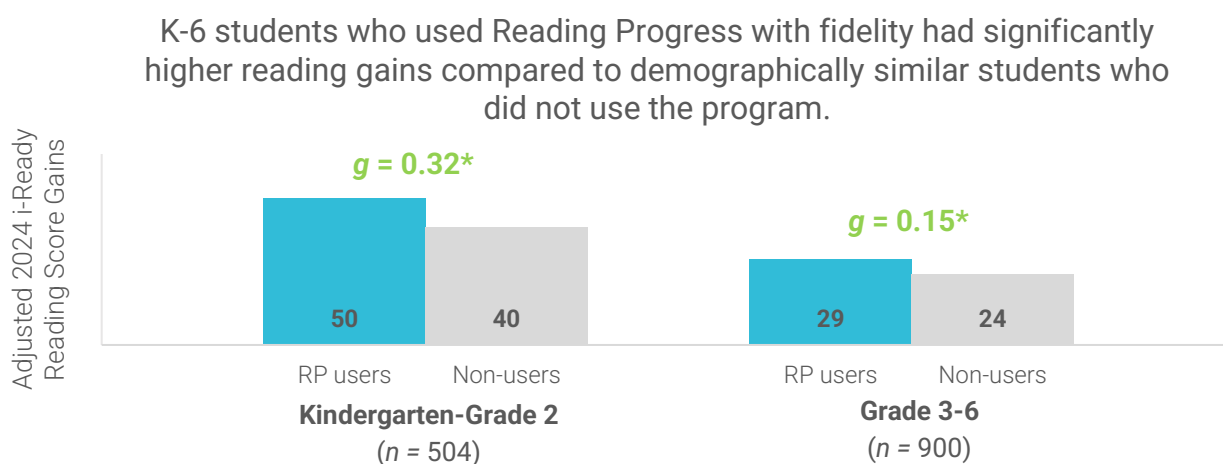


Figure 10. Comparison of i-Ready reading gains between K-6 students who used Reading Progress with fidelity and those who did not use Reading Progress



Did the impact of Reading Progress vary by student subgroup?

Researchers conducted multilevel models examining the impact of Reading Progress on reading achievement by free/reduced price lunch and English Learner status. Models included a matched sample of users and non-users and controlled for student demographics. Researchers used propensity score matching to ensure the intervention and comparison group had similar beginning of year i-Ready Reading scores and demographic characteristics. As reported in Table B6 of Appendix B, the two groups were equivalent on all available metrics besides their usage of Reading Progress for all impact analyses (see full model results in Appendix C).

By free/reduced price lunch status. Among K-2 students who qualified for free/reduced price lunch, those who used Reading Progress with fidelity had significantly higher end-of-year reading achievement compared to demographically similar peers who did not use the program, ($p < 0.05$, $g = 0.27$). **In other words, if a student who qualified for free/reduced price lunch who experienced gains at the 50th percentile had used Reading Progress with fidelity, they would be expected to experience gains at the 61st percentile (see Figure 11).** Furthermore, among grade 3-6 students who qualified for free/reduced price lunch, those who used Reading Progress had significantly

higher end-of-year reading achievement compared to demographically similar peers who did not use the program ($p < 0.05$; $g = 0.05$). In other words, if a student who qualified for free/reduced price lunch at the 50th percentile had used Reading Progress, they would be expected to perform at the 57th percentile.

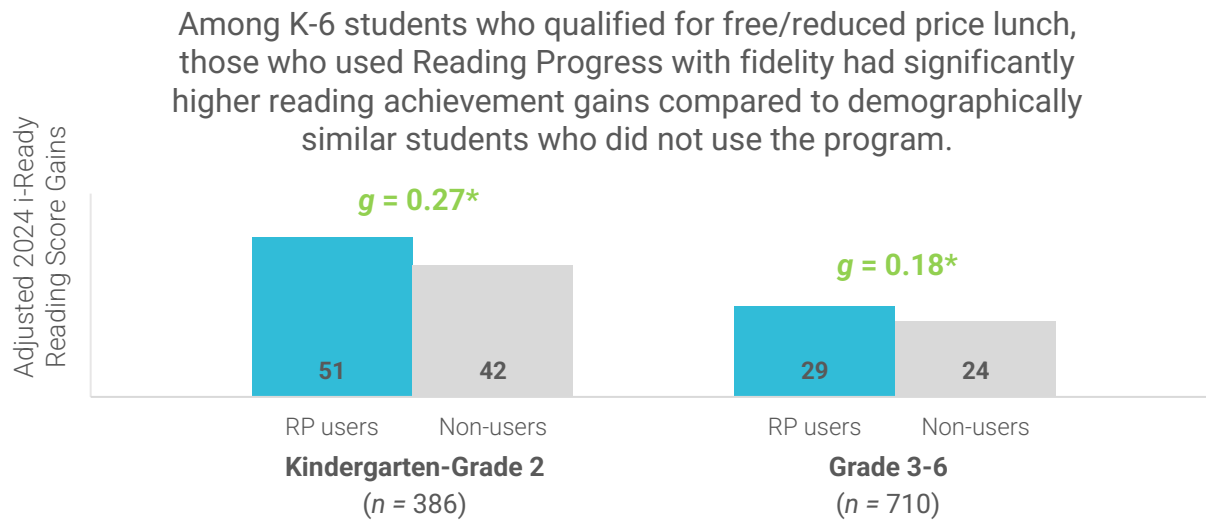


Figure 11. Comparison of end-of-year i-Ready Reading scale scores between K-6 free/reduced price lunch students who used Reading Progress with fidelity and those who did not use Reading Progress

By English learner status. Overall, K-2 and 3-6 English learners who used Reading Progress did not have significantly higher end-of-year reading achievement compared to demographically similar K-2 English learners who did not use the program see (Figure 12).

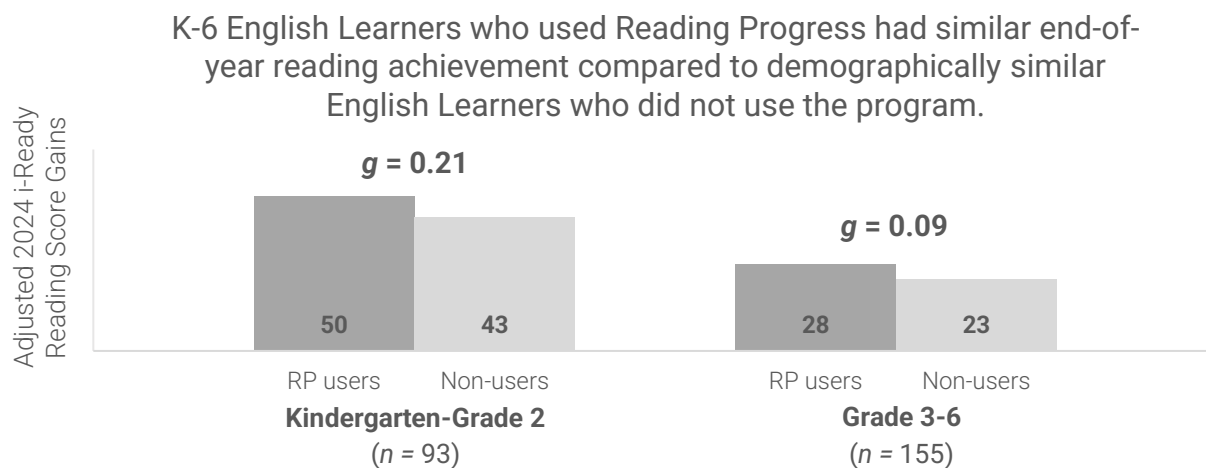


Figure 12. Comparison of end-of-year i-Ready Reading scale scores between K-6 English learner students who used Reading Progress with fidelity and those who did not use Reading Progress

Conclusions

Given multiple positive outcome findings, this study provides results to satisfy ESSA evidence requirements for Level II (*Moderate Evidence*). Specifically, this quasi-experimental study met the following criteria:

- ✓ Proper design and implementation
- ✓ Baseline equivalence for treatment and comparison groups
- ✓ Statistical controls through covariates
- ✓ At least 350 students in the analysis sample
- ✓ Representative, multi-site study
- ✓ At least one statistically significant, positive finding

Acknowledgements

This report was made possible through collaboration and feedback from representatives of the participating district. Specifically, we'd like to thank Brian Dvorak and Dr. Molly O'Neill for their work supporting educators implementing Reading Progress and for providing critical insight into local context. We'd also like to thank Bryan Alvarado for his expertise on district data systems and facilitating the sharing of data for the study. We are grateful to Dr. Philip Neufeld for championing this work in the district and partnering to ensure the accessibility and applicability of study findings. Finally, we thank all the participating district educators for their daily work helping students become readers and positioning them for future success in K-12 education and beyond.

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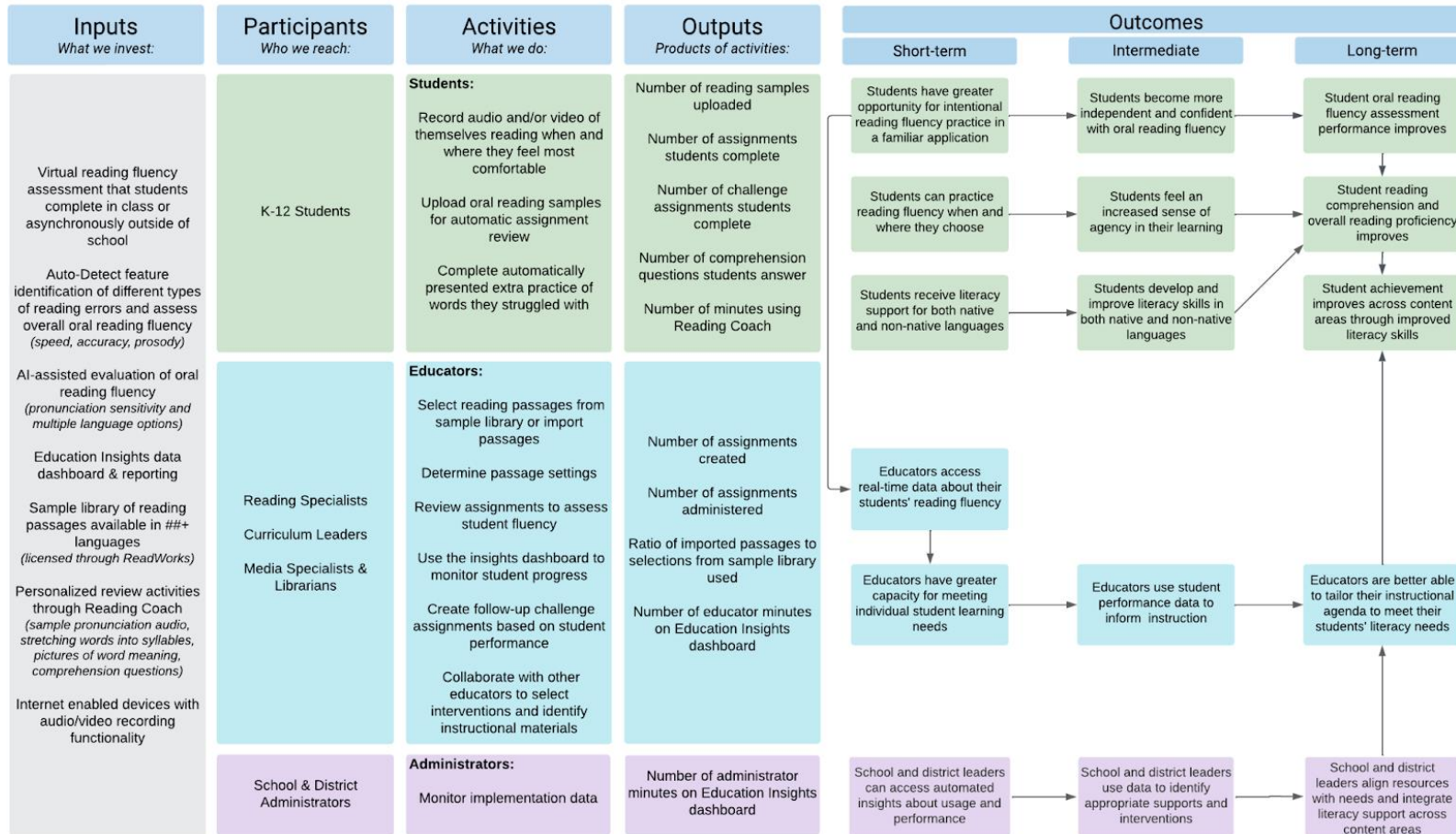
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Appendix A. Reading Progress Logic Model



Problem Statement:

Traditional one-on-one fluency assessments present a persistent challenge for educators who are tasked with simultaneously meeting diverse instructional needs, including those of English language learners and students with disabilities. Reading Progress and Reading Coach provides asynchronous fluency assessment data collection, automated AI-assisted data analysis, and on-demand insights to help visualize class and student-level performance and growth so educators can spend more time teaching and less conducting and interpreting assessments.



Appendix B. Methods & Demographics

Tables B1-B3 display participant demographics for the entire district and for the matched analysis samples. Overall, the study sample reflected district demographics.

Table B1. Full district demographics

	Reading Progress users (n = 2,914)	Non-users (n = 28,085)	Total (n = 30,999)
Female	50%	50%	50%
Race/Ethnicity			
Hispanic	69%	68%	68%
Asian	13%	11%	11%
White	6%	8%	8%
Black	7%	8%	7%
Multiracial	4%	5%	4%
Native American/Alaskan	1%	1%	1%
Pacific Islander	0.5%	0.5%	0.5%
English learner status	20%	20%	20%
Disability status	1%	1%	1%
Low-income status	79%	76%	77%

Table B2. Matched sample demographics for all Reading Progress users

	Reading Progress users (n = 2,914)	Non-users (n = 2,914)	Total (n = 5,828)
Female	50%	49%	50%
Race/Ethnicity			
Hispanic	69%	72%	70%
Asian	13%	11%	12%
White	6%	6%	6%
Black	7%	5%	6%
Multiracial	4%	4%	4%
Native American/Alaskan	1%	0.5%	1%
Pacific Islander	0.5%	0.4%	0.4%
English learner status	20%	20%	20%
Disability status	1%	2%	2%
Low-income status	79%	80%	79%

Table B3. Matched sample demographics for Reading Progress users who met implementation fidelity threshold

	Reading Progress users (n = 702)	Non-users (n = 702)	Total (n = 1,404)
Female	49%	48%	48%
Race/Ethnicity			
Hispanic	66%	69%	67%
Asian	15%	13%	14%
White	6%	7%	7%
Black	8%	7%	7%
Multiracial	4%	4%	4%
Native American/Alaskan	1%	1%	1%
Pacific Islander	0.3%	0.4%	0.4%
English learner status	20%	15%	18%
Disability status	1%	2%	2%
Low-income status	77%	79%	78%

Study Design

This study used a quasi-experimental design with a propensity score matched sample and covariate adjustments to align with ESSA Level II evidence standards. The treatment group included students who used Reading Progress during the 2023-24 school year and the comparison group included students who did not use Reading Progress.

Measures

Researchers used Reading Progress platform usage data (see Tables B2 and B3) and administrative records in the present study. These data included student-level demographics and 2023-24 school year i-Ready reading assessment performance. The participating district leveraged the Open Education Analytics (OEA) schema and platform (Azure Synapse and Datalake) to anonymize and share study data.

Table B4. Monthly Reading Progress usage metrics for fall 2023 semester

	August (n = 532)		September (n = 1,252)		October (n = 1,290)		November (n = 1,171)		December (n = 535)	
	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range
Usage metrics										
Average assignments submitted	4	1-30	7	1-70	8	1-80	6	1-51	5	1-86
Average words read	148	6-1,361	895	29-8,848	1,073	23-6,376	795	22-3,827	675	36-3,900
Average words per assignment	48	6-110	83	29-174	97	12-266	99	19-319	104	12-236
Performance metrics										
Average words per minute	23	0-105	29	0-111	29	0-99	35	0-136	33	0-119
Average assignment accuracy	33%	0-100%	41%	0-92%	45%	0-95%	48%	0-95%	47%	0-96%

Table B5. Monthly Reading Progress usage metrics for spring 2024 semester

	January (n = 475)		February (n = 986)		March (n = 876)		April (n = 763)	
	Mean	Range	Mean	Range	Mean	Range	Mean	Range
Usage metrics								
Average assignments submitted	3	1-43	9	1-154	11	1-83	15	1-127
Average words read	148	6-1,361	895	29-8,848	1,073	23-6,376	795	22-3,827
Average words per assignment	48	6-110	83	29-174	97	12-266	99	19-319
Performance metrics								
Average words per minute	23	0-105	29	0-111	29	0-99	35	0-136
Average assignment accuracy	33%	0-100%	41%	0-92%	45%	0-95%	48%	0-95%

Propensity Score Matching

To ensure the validity of findings, researchers tested for baseline equivalence of student i-Ready reading fall 2023 scale scores and examined demographics between treatment and comparison groups.

Researchers used propensity score matching without replacement to determine the analytic sample. To calculate propensity scores, researchers conducted binary logistic regression with student group as the dependent variable and fall 2023 i-Ready Reading scale score, grade level,

gender, ethnicity, English learner status, low-income status, and disability status as covariates. The final analytic sample included 5,828 students (2,914 treatment and 2,914 comparison).

Baseline Equivalence

Once researchers identified the matched sample, they conducted baseline equivalence using multilevel models predicting fall 2023 i-Ready Reading scale scores. The results of baseline equivalence analyses are included in Table B4. Because matched treatment and comparison groups had Hedges' *g* values below 0.25, researchers considered groups equivalent for subsequent analyses (WWC, 2022).

Table B6. Baseline equivalence of i-Ready Reading scores in matched analysis sample

Fall 2023 i-Ready reading scale scores	Reading Progress users	Non-users	Hedges' <i>g</i>	Equivalent for analyses?
All users				
Kindergarten-Grade 2 (<i>n</i> = 1,239)	421.77 (54.45)	417.84 (54.68)	0.07	✓
Grade 3-6 (<i>n</i> = 4,589)	507.35 (63.06)	506.68 (61.86)	0.01	✓
Users who met implementation fidelity threshold				
Kindergarten-Grade 2 (<i>n</i> = 504)	432.49 (55.30)	432.12 (55.20)	0.01	✓
Grade 3-6 (<i>n</i> = 900)	500.44 (66.06)	504.96 (68.29)	-0.07	✓
English Learners				
Kindergarten-Grade 2 (<i>n</i> = 93)	413.58 (50.00)	422.11 (46.38)	-0.18	✓
Grade 3-6 (<i>n</i> = 155)	471.16 (55.86)	466.39 (59.91)	0.08	✓
FRPL				
Kindergarten-Grade 2 (<i>n</i> = 386)	426.85 (53.89)	428.02 (53.58)	-0.02	✓
Grade 3-6 (<i>n</i> = 710)	498.05 (66.30)	500.72 (67.73)	-0.04	✓

Appendix C. Multilevel Model Results

Unstandardized coefficients representing the effect of Reading Progress are displayed in bold, blue text. Significant values (i.e., $p < 0.05$) are denoted with an asterisk.

Table C1. Multilevel model results examining influence of Reading Progress on internal performance metrics by K-2 usage group

Outcome	Reading Progress user	BOY i-Ready Reading	Hedges' g	p-value
Accuracy				
Low (<42) vs. medium (42-118) usage	6.04	0.20*	0.22	0.050
Low (<42) vs. high (>118) usage	12.82*	0.20*	0.46*	0.005
Medium (42-118) vs. high (>118) usage	6.79	0.20*	0.29	0.149
Words Per Minute				
Low (<42) vs. medium (42-118) usage	4.81	0.25*	0.18	0.086
Low (<42) vs. high (>118) usage	10.48*	0.25*	0.39*	0.012
Medium (42-118) vs. high (>118) usage	5.67	0.25*	0.23	0.184

Table C2. Multilevel model results examining influence of Reading Progress on internal performance metrics by grade 3-6 usage group

Outcome	Reading Progress user	BOY i-Ready Reading	Hedges' g	p-value
Accuracy				
Low (<39) vs. medium (39-131) usage	4.54*	0.22*	0.18*	0.004
Low (<39) vs. high (>131) usage	6.13	0.22*	0.24	0.058
Medium (39-131) vs. high (>131) usage	1.59	0.22*	0.09	0.644
Words Per Minute				
Low (<39) vs. medium (39-131) usage	6.36*	0.41*	0.17*	0.003
Low (<39) vs. high (>131) usage	6.76	0.41*	0.17	0.126
Medium (39-131) vs. high (>131) usage	0.41	0.41*	0.01	0.931

Table C3. Multilevel model results examining the impact of Reading Progress on end-of-year reading achievement, overall and among users who met implementation fidelity threshold

Outcome	Reading Progress user	Hedges' g	p-value
All users			
Kindergarten-Grade 2 (n = 1,239)	5.65*	0.18*	0.005
Grade 3-6 (n = 4,589)	2.86*	0.05*	0.006
Users who met implementation fidelity threshold			
Kindergarten-Grade 2 (n = 614)	9.56*	0.32*	0.000
Grade 3-6 (n = 900)	4.54*	0.15*	0.044

Table C4. Multilevel model results examining the impact of Reading Progress on end-of-year reading achievement among students who qualified for FRPL, overall and among users who met implementation fidelity threshold

Outcome	Reading Progress user	Hedges' g	p-value
All users			
Kindergarten-Grade 2 (n = 1,239)	7.58*	0.23*	0.001
Grade 3-6 (n = 3,677)	2.82*	0.09*	0.014
Users who met implementation fidelity threshold			
Kindergarten-Grade 2 (n = 386)	8.50*	0.27*	0.007
Grade 3-6 (n = 710)	5.49*	0.18*	0.028

Table C5. Multilevel model results examining the impact of Reading Progress on end-of-year reading achievement among English learners, overall and among users who met implementation fidelity threshold

Outcome	Reading Progress user	Hedges' g	p-value
All users			
Kindergarten-Grade 2 (n = 270)	4.73	0.15	0.224
Grade 3-6 (n = 901)	3.17	0.11	0.118
Users who met implementation fidelity threshold			
Kindergarten-Grade 2 (n = 93)	6.74	0.21	0.316
Grade 3-6 (n = 155)	5.13	0.09	0.311