

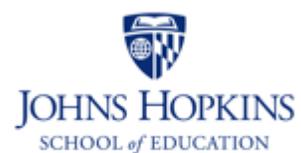


The efficacy of Istation's Early Reading Assessment and Curriculum on MAP Reading growth in a South Carolina school district

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February 2021



**Center for Research and
Reform in Education**

Contents

EXECUTIVE SUMMARY:	iii
Method.....	2
Research Design.....	2
Participants	2
Measures	3
NWEA MAP.	4
Analytical Approach	4
Results.....	4
By grade.....	4
Discussion	7

EXECUTIVE SUMMARY:

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In June 2019 The Center for Research and Reform in Education (CRRE) at Johns Hopkins University contracted with Istation to conduct a mixed-methods evaluation study of the implementation and impacts on student achievement of Istation's ISIP Early Reading (ISIP ER) and Advanced Reading (ISIP AR) assessments in a school district in a small city in South Carolina. The present report examines findings from quantitative analyses comparing NWEA MAP reading growth of district students who used Istation and matched comparison students identified by NWEA's Similar Schools Report who did not use Istation. This report serves as a supplement to the Phase 2 quantitative report.

This report was designed to address the following research questions:

1. How does growth in students' achievement on the MAP reading assessment compare to that of a virtual control group?
 - a. To what degree are ISIP ER/AR scores predictive of MAP performance?
 - b. Do outcomes vary for different student subgroups?
 - c. Do outcomes vary by year?

T-tests and correlational analyses were used to examine differences in MAP reading growth from spring 2017 to spring 2019 between district and comparison students over two cohorts of students. These cohorts were grades 1 and 2 students in spring 2017, meaning they were grades 3 and 4 students in spring 2019. The important findings from these analyses include:

- District Istation students significantly outgained comparison students on the MAP reading assessment from spring 2017 to spring 2019. This advantage was most apparent in the first (younger) cohort of students, and meets standards for WWC ESSA Tier 2 evidence.
- Students in schools that met recommended Istation guidelines of at least 30 minutes of usage per week generally experienced larger MAP reading gains than did otherwise similar comparison students.

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The ISIP ER assessment, developed by Dr. Joseph Torgeson, Dr. Patricia Mathes, and Dr. Jeannine Herron, is a validated computer-based adaptive testing system that provides benchmark and continuous progress monitoring of student performance. Key indicators include:

- Assessment in critical domains of reading in all tested grades
- Assessment of skills most predictive of future reading success
- Assessment of progress in each area relevant to a larger domain
- Provision of a comprehensive snapshot of reading ability

Testing occurs in a game-like and engaging environment. Scoring results are obtained and reported to teachers immediately after test completion. The assessments are nationally normed every three to five years. ISIP ER levels were originally reported on a three-tier normative grouping, based on scores associated with the 20th and 40th percentiles, similar to the Response to Intervention (RTI) model. During the 2018-19 school year, however, the reporting system was changed by Istation to a five-tier grouping model.

The district adopted Istation for assessment and learning support (via the Curriculum) in school year 2014-15. It was used in its four elementary schools and one middle school.

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Method

Research Design

This set of analyses examined retrospective MAP reading assessment data from the spring 2017 and spring 2019 MAP reading administrations. Istation was used throughout all of the elementary schools in the district, meaning a comparison group of students was not readily available for analysis. Thus, a Similar Schools Report generated by NWEA (a more detailed description follows) provided an equivalent comparison group to satisfy the quasi-experimental design (QED) of this evaluation.

Participants

The school district is a “small city” district of approximately 7,400 students in northeast South Carolina. The majority of its students (53%) are White, with Black students (40%) constituting the next largest ethnic subgroup. Approximately 70% of the students come from economically disadvantaged families, 7% are Limited English Proficient students, and 11% are disabled/special education students. For the purposes of the present study, five schools support the grade levels that have participated in ISIP ER and ISIP AR testing for multiple years. The schools are fairly diverse in student demographics. Demographics by school can be found in Appendix A.

Student demographics for participants in this evaluation are displayed in Table 1. “Other Race” is defined as ethnicities other than White, Black, and Hispanic/Latino, which are the three dominant ethnicities in the district. The analytic sample generally had smaller proportions of White students and larger proportions of Black students than did the overall district. Proportions of economically disadvantaged, special education, and LEP students were generally similar to district-wide proportions.

Table 1
Student characteristics for analytic sample

Group	
% Black	53.88
% White	39.16
% Hispanic	4.69
% Other Race	4.69
% Female	53.40
% Economically disadvantaged	60.68
% Students with Disabilities/SPED	12.14
% ELs	5.34

N

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For this QED, we examined two particular cohorts in a set of analyses comparing growth in MAP reading scores by district students using Istation with that of otherwise similar students not from the district who did not use Istation. Since all schools in the district used Istation, we obtained a Similar Schools Report from NWEA to create a comparison group. The Similar Schools Report contains data from students who, relative to the intervention sample, come from schools in a similar area (i.e., urban, suburban, rural) with similar percentages of FRL students. In addition, individual students are matched on the basis of grade level and prior MAP achievement, as well as demographics including gender and ethnicity. Each student is matched with multiple comparison students, ranging from as few as three to as many as 51, on the basis of these variables. This creates a “virtual comparison” group of students for each district student, as well as the district as a whole, allowing for a comparison of MAP reading score growth between district students who used Istation and otherwise similar students who did not use Istation. The cohorts we examined consisted of grades 1 and 2 students from spring 2017 to spring 2019, when these students were in grades 3 and 4, respectively. Table 2 shows the average spring 2017 (pretest) scores for district Istation students and comparison students identified by the Similar Schools Report. Baseline equivalence is met if the standardized mean difference between treatment (Istation) and comparison students is less than 0.25. Standardized mean differences between Istation and comparison students were less than 0.01, indicating that baseline equivalence was satisfied. The extremely small size of these baseline differences was expected, as prior achievement was one of the variables used by NWEA to select comparison students.

Table 2

Baseline equivalence on spring 2017 MAP reading scores

	Istation Mean (SD)	Control Mean (SD)	Adjusted T v C Difference	Pooled Unadjusted SD	Stan. Mean Diff.
Cohort 1	176.74 (14.77)	176.64 (14.58)	0.10	14.68	0.008
Cohort 2	188.69 (15.62)	188.61 (15.41)	0.08	15.51	0.006
All students	183.33 (16.35)	183.23 (16.17)	0.10	16.25	0.006

NOTE: SD=standard deviation

Measures

Data sources for the current study include student demographic data and NWEA MAP Reading achievement data. MAP reading scores from spring 2017 and spring 2019

were analyzed to examine and compare growth between Istation students and comparison students identified by NWEA that did not use Istation.

NWEA MAP. NWEA MAP data were obtained from each of the 2016-17 through 2019-20 school years, although for this set of analyses, we only used spring 2017 and spring 2019 scores. NWEA MAP assessments are administered annually to all district students in grades K-5. MAP RIT scores are vertically scaled so that scores can be directly compared across grade levels, although it is generally expected that students' scores will increase as they progress through grade levels. We present the observed ranges of scores for RIT reading scores for district students in Table 3.

Table 3
MAP RIT reading scores ranges, by grade

Grade	MAP RIT reading score range
Grade 1	130-202
Grade 2	134-218
Grade 3	141-232
Grade 4	149-235

Analytical Approach

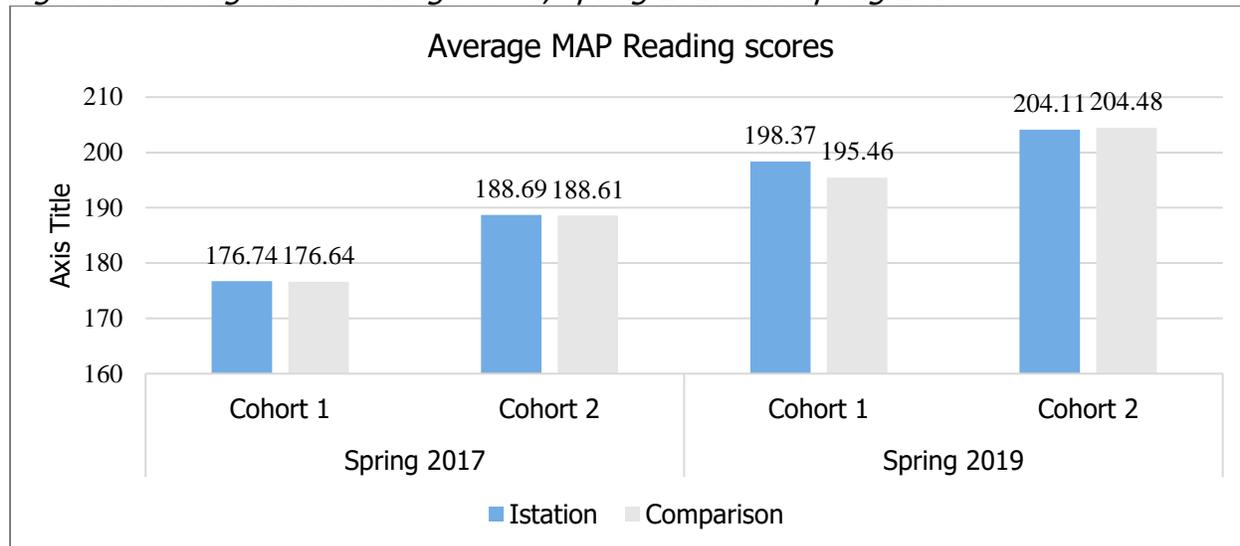
We conducted a QED on NWEA MAP reading scores by comparing gains from spring 2017 to spring 2019 for two cohorts of district students who used Istation and comparison students identified by NWEA's Similar Schools Report. The data in the Similar Schools Report included MAP reading scores from spring 2017 and spring 2019, as well as relevant summary statistics for the virtual comparison group. The use of NWEA's virtual comparison group allows for the design of a QED that meets WWC standards with reservation and ESSA Tier 2 standards by meeting the baseline equivalence criterion, using the spring 2017 MAP reading assessment, as well as using a sample size of greater than 350 students.

Results

In this section, we describe the results of the comparison analyses for both Istation cohorts. Specifically, we examined students in grades 1 and 2 in spring 2017, who were then grades 3 and 4 students in spring 2019. In these analyses, spring 2017 grade 1 students will be referred to as Cohort 1, while spring 2017 grade 2 students will be referred to as Cohort 2.

By grade. We first descriptively compare achievement gains by grade across all schools to examine broad patterns of gains relative to comparison students. Figure 1 shows the average MAP reading scores in spring 2017 and spring 2019 for each of the two cohorts examined.

Figure 1. Average MAP reading scores, spring 2017 and spring 2019



Gains were larger by over 2.5 points for Cohort 1 Istation students than for comparison students. By contrast, gains were very similar for both groups in Cohort 2, with comparison students outgaining Istation students by only approximately 0.5 points.

Next, to determine the statistical significance of gain-score differences from spring 2017 to spring 2019, we conducted matched t-tests on mean reading gains for the Istation and comparison groups. Table 4 shows the estimated effects of Istation on MAP reading gains for all students and by grade. Students included in these analyses had non-missing spring 2017 and spring 2019 MAP reading scores, as well as at least one non-missing ISIP score.

Table 4

MAP reading gains relative to comparison students, spring 2017-spring 2019

Cohort	Estimate	Standard Error	p-value
Overall	0.904*	0.382	.018
Cohort 1	2.575***	0.564	<.001
Cohort 2	-0.497	0.57	.328

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

The estimate column in table 4 refers to the difference in MAP reading gains between Istation and comparison students in a particular cohort. Overall, Istation students averaged nearly a full point more of MAP reading growth from spring 2017 to spring 2019 than did comparison students. This difference was statistically significant ($p = .018$). Separate cohort analyses indicated that Istation students in Cohort 1 averaged more than a 2.5 point larger MAP reading gain than did comparison students ($p < .001$). No significant differences in MAP reading gains were found for Cohort 2.

Overall, these results give evidence that Istation use was associated with significantly larger reading achievement gains, especially in Cohort 1.

Additionally, NWEA’s Similar Schools Report provided a breakdown of observed versus typical comparison student growth, as measured by effect sizes, by school and grade level. This allowed us to examine the relationship between Istation impacts on students MAP reading growth, relative to comparison students, and average minutes of Istation usage, by school. Figures 1 and 2 display these relationships, by cohort.

Figure 2. Relationship between MAP reading growth effect size and Istation usage, by school (cohort 1)

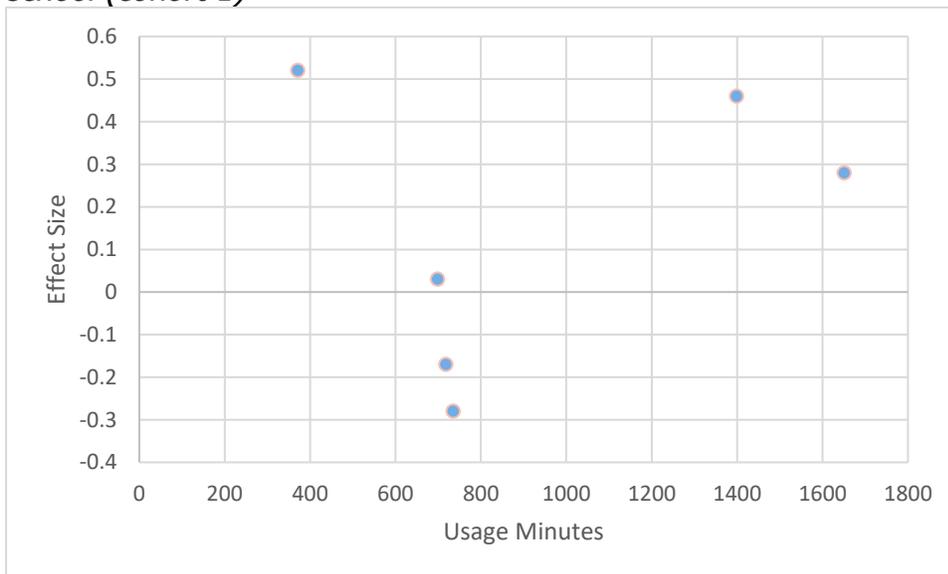
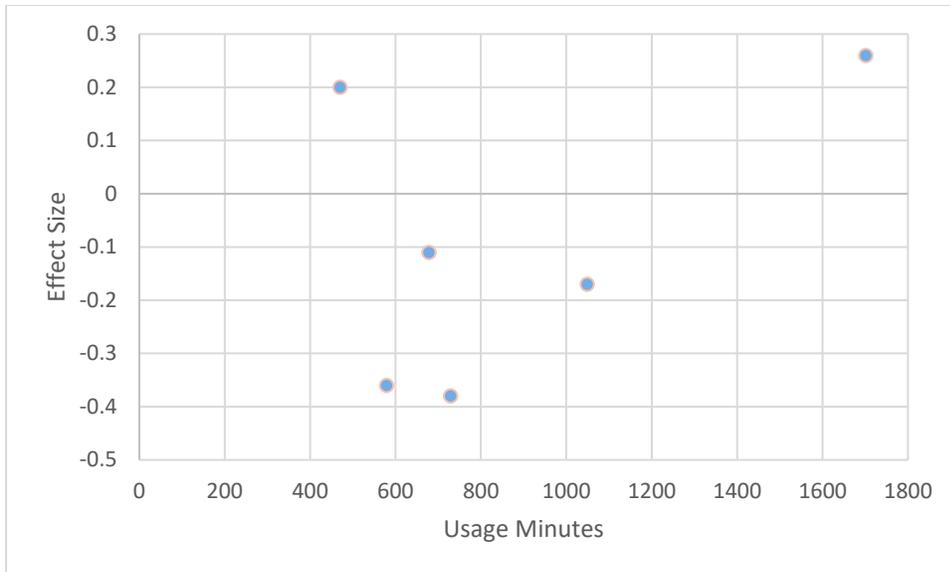


Figure 3. Relationship between MAP reading growth effect size and Istation usage, by school (cohort 2)



With the exception of the same school in each cohort, a generally positive relationship between average minutes of Istation usage and MAP reading gains is shown in Figures 1 and 2. The one school that had the lowest amounts of average Istation usage in both cohorts used Istation at a level that suggests Diagnostic usage only, with no Instructional usage. Since this school was one of the top two achieving schools in each cohort, it is possible this school was choosing not to use Istation Instruction, as these students were already high achieving and did not require additional intervention. Since the Istation curriculum is used more frequently as an intervention tool with students in Tier 3 and Tier 2, this result is not surprising. For the remaining schools as a general trend, increased levels of Istation Instructional usage are associated with greater MAP reading gains. Further, schools that met recommended Istation guidelines of at least 30 minutes of Istation usage per week consistently demonstrated greater MAP reading gains than did comparison students. This finding was consistent across both cohorts.

Discussion

The purpose of the analyses described in this report was to compare MAP reading assessment growth from spring 2017 to spring 2019 of district Istation students in relation to that of otherwise similar students who did not use Istation. As Istation was used in all district elementary schools, a Similar Schools Report was obtained from NWEA that included MAP reading data from students matched to district students on the basis of prior reading achievement and demographic variables. This created a virtual comparison group of students who did not use Istation, but were otherwise very similar to district students who did use Istation.

Some important limitations of this evaluation should be noted. First, this study was conducted in an entire district that had implemented the Istation curriculum and

Istation ER and AR assessment packages. However, even though no comparison schools were available within the district for the purpose of evaluation program efficacy, the use of a Similar Schools report allowed for a comparison of MAP reading gains between district and those from otherwise similar non-Istation students. As data from only one district were analyzed, generalization of results is restricted, relative to a study involving multiple districts.

Results showed that Istation students significantly outgained virtual comparison students, with this pattern especially pronounced for the younger cohort of students. Across both cohorts, Istation students averaged a statistically significant nearly one-point advantage in MAP reading score gain over comparison students. Cohort 1 showed a significantly greater MAP reading gain of 2.5 points relative to comparison students, whereas Cohort 2 did not differ from the comparison group. Additionally, students, in schools that met Istation's recommended usage guidelines for instruction consistently outperformed comparison students in terms of MAP reading gains. Since comparison students were very similar to district Istation students in terms of demographics and prior reading achievement, and the sample size used was sufficiently large, the results of these analyses support the conclusion that Istation usage is related to larger reading achievement gains, in relation to non-Istation users. Further, the results of this study meet the criteria for WWC Standards with Reservations, as well as those for "Moderate" evidence of the efficacy of Istation in improving student reading performance per the Every Student Succeeds Act (ESSA).