

## Research Brief: Study Island in Allentown, Pennsylvania

*ESSA Level of Research: Level 3 – Moderate Evidence (Quasi-Experimental)*

### Summary

Sixth-grade math students who used Study Island practice earned significantly higher state test scores than students of a similar ability who did not use Study Island practice. For all subjects and grade levels with enough usage to analyze, there is a strong, statistically significant relationship between students' scores on Study Island Benchmarks and their later scores on the state test.

### Background

Edmentum partnered with Allentown School District (ASD) in Allentown, Pennsylvania, for this Study Island research study. ASD is a mid-sized urban school district. Compared to the rest of Pennsylvania, ASD has a higher percentage of students who qualify for free and reduced lunch and a higher Hispanic population.

ASD administers the Pennsylvania System of School Assessment (PSSA) every year to students in grades 3 through 8 for English Language Arts (ELA) and math, as well as grades 4, 8, and 11 for science.

### Data

We examined **student-level data** (scores and usage data from individual students) from 18 Allentown schools: 14 elementary schools and four middle schools. All these schools were Study Island partners during the 2016-2017 academic year. The district provided student-level demographic information and PSSA data from the previous two years' testing periods (spring 2016 and spring 2017). These data were matched to Edmentum's internal Study Island practice and Benchmark data using student IDs.

Edmentum's focus on student-level data sets our research studies apart from other studies that often rely on data at the school or district level. This more granular level of data helps us see how our products affect individual students and follows research best practices.

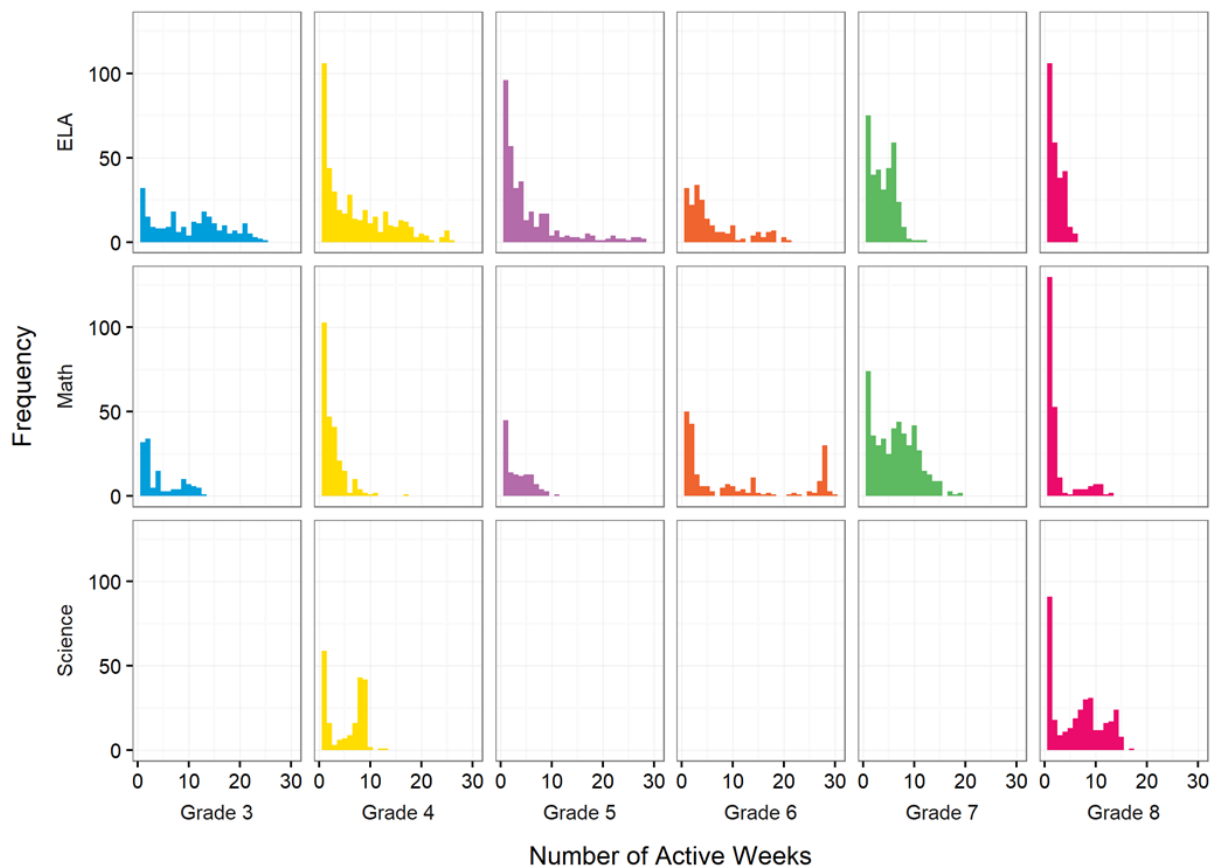


## Results

### Use of Study Island Practice

In general, usage across the district was low. Students answered few questions and spent little time in Study Island practice. Figure 1 shows the distribution of active weeks by subject and grade.

Figure 1. Distribution of active weeks by subject and grade



Sixth-grade math students spent the most time overall answering practice questions. Across the school year, they averaged approximately 9.5 hours and 600 questions per student. Fourth-grade ELA and seventh-grade math also showed patterns of relatively consistent use.

### Use of Study Island Benchmarks

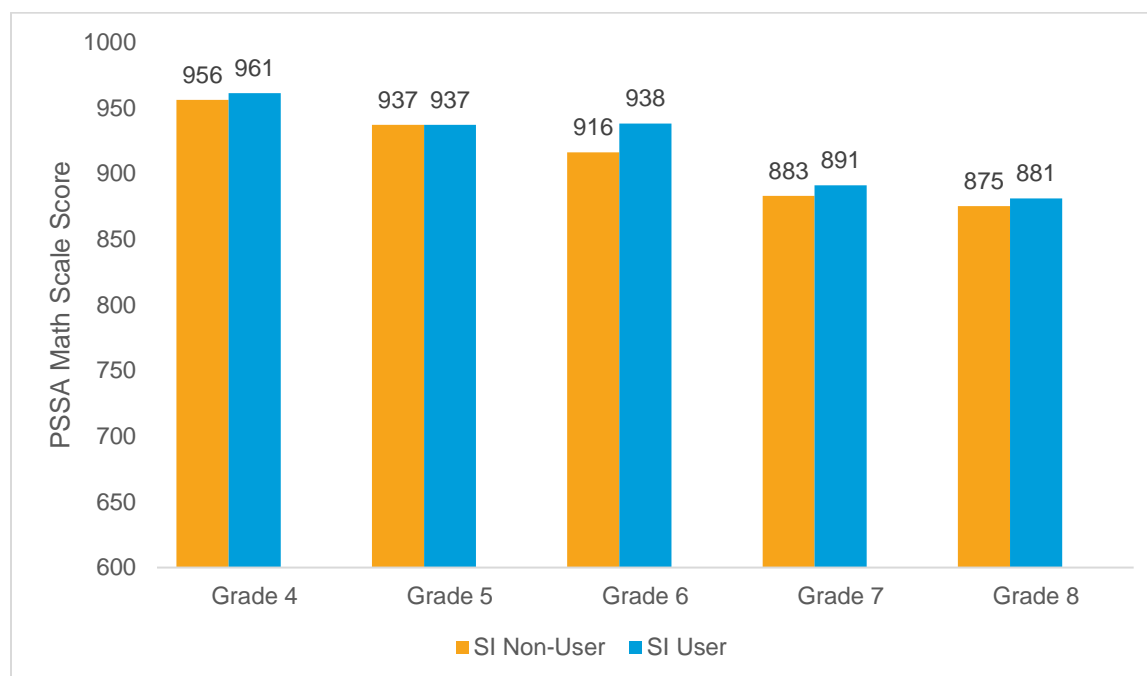
Benchmark use was heavily concentrated in grades 7 and 8 for math and ELA and in grades 4 and 8 for science. The district used a different benchmark for the other grades and subjects.

## Relationship Between Study Island Practice and the PSSA

For this study, we needed to make sure that any differences we saw between Study Island users and non-users was due to students' use of Study Island, not to natural differences in student ability. To analyze math and ELA results, we used a statistical technique called *propensity score matching* (PSM) to compare students' 2016 and 2017 PSSA scores and to control for students' natural ability. We performed PSM if we had both 2016 and 2017 scores for a group of students. For example, we didn't perform PSM for third graders who took the PSSA in 2017 because we did not have 2016 scores for them (students don't take the PSSA in second grade).

Figure 2 shows the relationship between use of Study Island practice and PSSA math scores. The baseline of this graph, 600, is the lowest possible score on the math PSSA.

*Figure 2. Average scale scores on the math PSSA for Study Island users compared to non-users (after propensity score matching)*

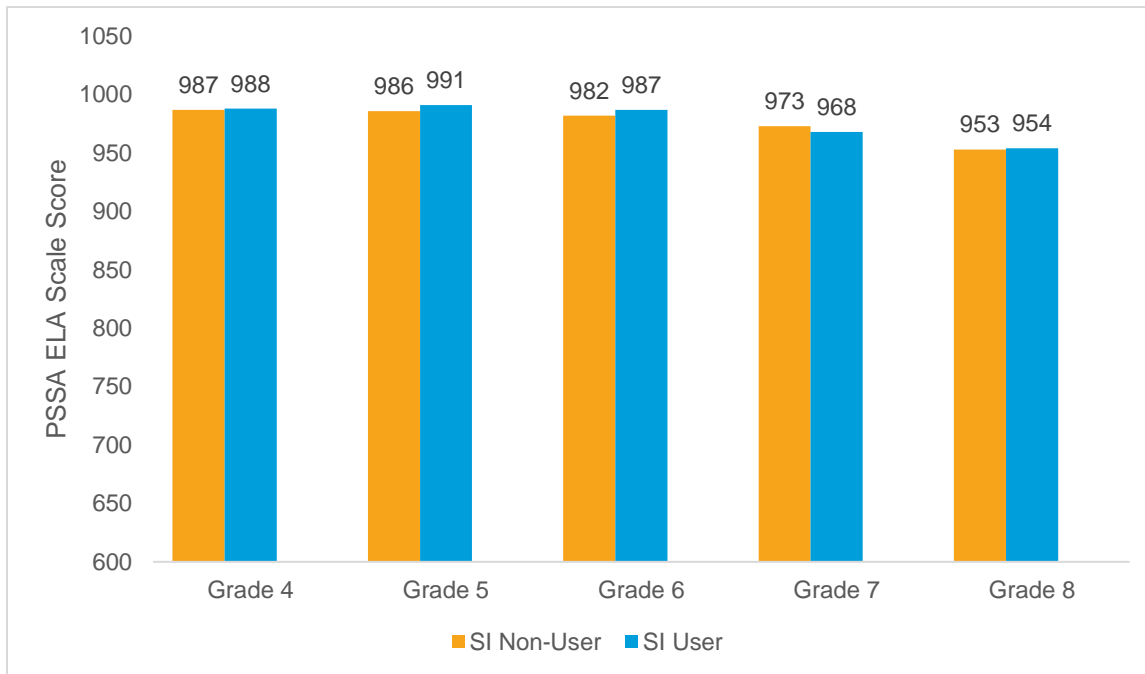


Students who used Study Island practice had generally higher scale scores on the math PSSA than students of a similar ability who didn't use Study Island. Fifth grade is the exception, with Study Island practice users earning the same average score as non-users. However, only **the difference in sixth grade is statistically significant**.

Referring back to Figure 1, sixth-grade math students used Study Island practice more than students in any other grade or subject. Therefore, it is not surprising that their scores are the only ones to show a statistically significant difference, especially when compared to the low, inconsistent use in most other grades and subjects.

Figure 3 shows the results for ELA. The baseline of this graph, 600, is the lowest possible score on the ELA PSSA.

Figure 3. Average scale scores on the ELA PSSA for Study Island users compared to non-users (after propensity score matching)



Here, we generally see higher scores for Study Island users than for non-users with a similar ability level, except for seventh grade. However, none of these differences is statistically significant.

Figure 4 depicts results for fourth-grade science. The baseline here, 1020, is the lowest possible score on the fourth-grade science PSSA.

Figure 4. Average scale scores on the fourth-grade science PSSA for Study Island users compared to non-users (no propensity score matching)

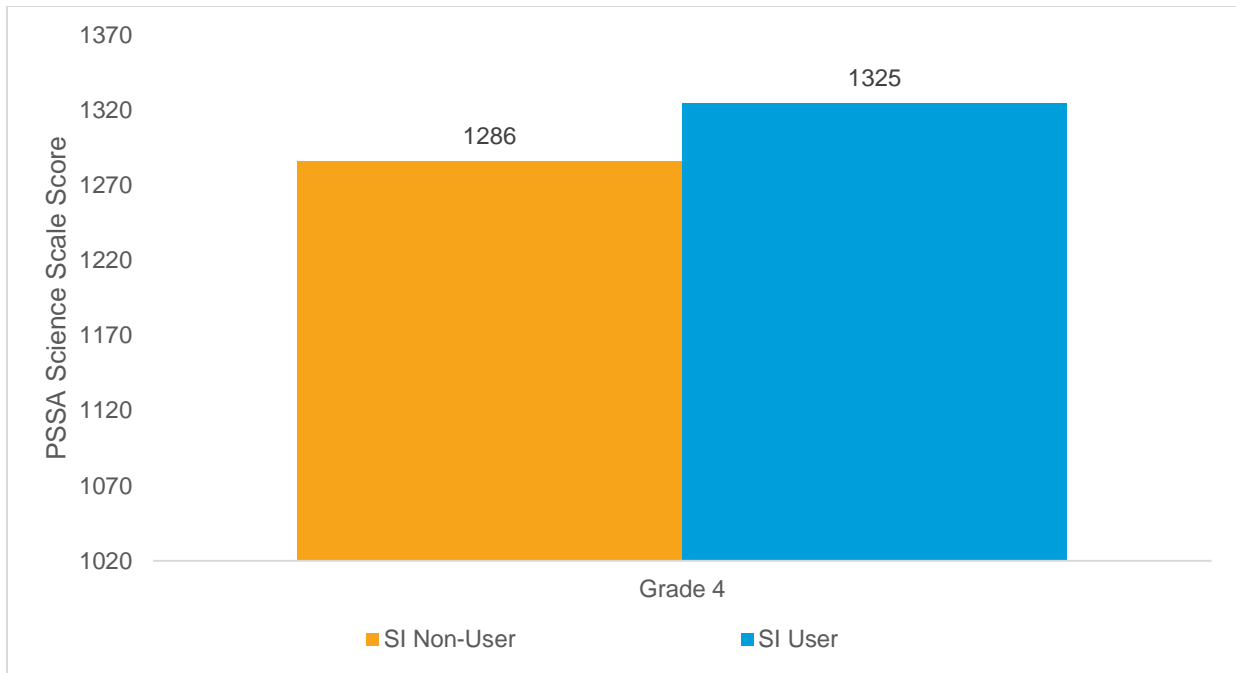
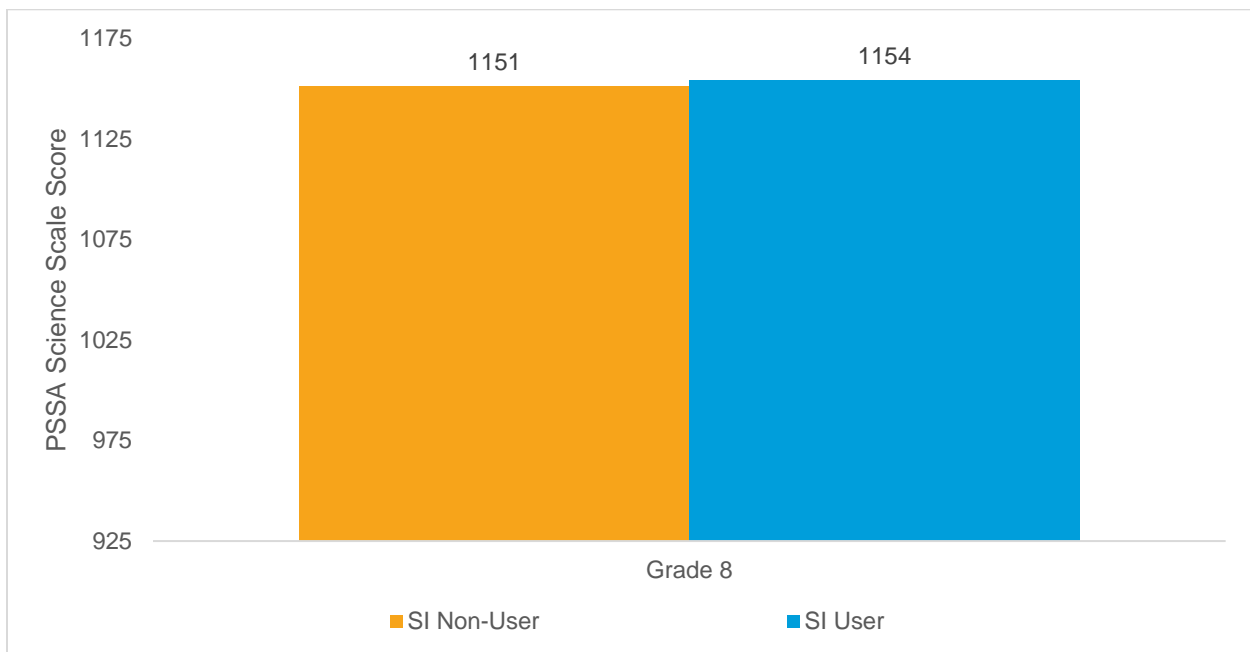


Figure 5 depicts results for eighth-grade science. The baseline here, 925, is the lowest possible score on the eighth-grade science PSSA.

Figure 5. Average scale scores on the eighth-grade science PSSA for Study Island users compared to non-users (no propensity score matching)



Because we could not perform propensity score matching for any students in science, we cannot conclude whether the differences in these scores are due to using Study Island practice or to students' natural ability.

### *Relationship Between Study Island Benchmarks and the PSSA*

Our analysis of Study Island Benchmarks was limited to Grades 7 and 8 for math and ELA and Grades 4 and 8 for science because of the low volume of use in the other subjects and grades.

**For all these subjects and grades, we found strong, statistically significant correlations between students' performance on Study Island Benchmarks and performance on the PSSA. Students' scores on Study Island Benchmarks predict their later scores on the PSSA.**

## **Conclusions**

Sixth-grade math students who used Study Island practice **earned significantly higher scores on their PSSA than students with a similar ability who did not use Study Island practice.**

In addition, when students are exposed to the Benchmarks, **there is a strong and significant relationship between scores on the Benchmarks and scores on the PSSA.** As such, educators can rely on Study Island Benchmarks to predict students' scores on the PSSA.

## **References**

- Cheung, A. C. K., & Slavin, R. E. (2012). How features of educational technology applications affect student reading outcomes: A meta-analysis. *Educational Research Review*, 7(3), 198-215.
- Cheung, A. C. K., & Slavin, R. E. (2013). The effectiveness of educational technology applications for enhancing mathematics achievement in K-12 classrooms: A meta-analysis. *Educational Research Review*, 9, 88-113.