Evidence Brief

The Impact of the Simple Solutions Approach on Student Learning

Harrison County Schools
2024-2025 Academic Year

Supported by Elite Research, LLC
Design Meets ESSA Evidence Tier 3 - Promising Results

Simple Solutions.
Minutes a Day–Mastery for a Lifetime!

Introduction

During the 2024-2025 school year, Harrison County Schools, located in rural Kentucky implemented the Simple Solutions Learning program's methodology based on the science of combining three mutually reinforcing learning strategies: retrieval practice, spaced repetition, and interleaving. The study encompassed 13 classrooms across 4 elementary schools in grades 3-5 with two of the four schools receiving the Simple Solutions Learning program and two schools that did not receive the program serving as control schools.

The Simple Solutions approach incorporates three powerful strategies that promote mastery, strengthen memory, and increase long-term retention more than any other approach and is applicable to any subject area. These solutions are:

1) Retrieval practice is calling to mind (retrieving) what has been learned. Retrieval requires putting forth effort and really thinking about a concept. This reinforces learning and makes it easier to retrieve in the future.
2) Spaced repetition is practicing repeatedly over time. During short study sessions, students revisit and interact with previously learned skills and concepts. It's the opposite of massed practice, or "cramming."
3) Interleaving is alternating among several different types of problems during a single practice session. It forces students to think about each problem and decide how to solve it, rather than repeating the same steps for every item on a page.

Harrison County Schools, Simple Solutions, and Elite Research LLC collaborated to conduct an evaluation of the impact of implementation and student performance, as measured by student mathematics *iReady* scores. Elite Research, LLC found that math scores increased from the beginning to the end of year in the treatment schools compared to the control schools for all grade levels controlling for demographic factors, *except* for third grade where there was a small decrease in math performance compared to control schools, though not statistically significant. The results indicate that there was a statistically significant increase in math performance for 4th grade students compared to control students. These findings suggest that the Simple Solutions approach does exhibit promising results – in line with ESSA Tier 3 designation.

Grade	iReady Math
3rd Grade	-
4th Grade	+
5th Grade	+
Overall	+

Green + indicates a statistically significant, positve result.

Methodology

Purpose

During the 2024-2025 academic year, Harrison County collaborated with Simple Solutions to study the implementation of their Simple Solutions Approach (SSA) and impact on student mathematics outcomes in grades 3-5.

Research Questions

The following guiding research questions informed the study design:

- RQ1: What is the effect of the Simple Solutions Approach (SSA) on student math performance compared to students without the SSA for *all grades 3rd through 5th*, as measured *iReady* mathematics scores over time and controlling for demographic characteristics?
- RQ2: What is the effect of the Simple Solutions Approach (SSA) on student math performance compared to students without the SSA for *3rd grade students*, as measured *iReady* mathematics scores over time and controlling for demographic characteristics?
- RQ3: What is the effect of the Simple Solutions Approach (SSA) on student math performance compared to students without the SSA for *4th grade students*, as measured *iReady* mathematics scores over time and controlling for demographic characteristics?
- RQ4: What is the effect of the Simple Solutions Approach (SSA) on student math performance compared to students without the SSA for *5th grade students*, as measured *iReady* mathematics scores over time and controlling for demographic characteristics?

Study Design

The research design for this study is a cluster-level quasi-experimental design utilizing a quantitative assessment of both teacher implementation and student math proficiency data to answer the study research questions. The quantitative approach utilizes a two-group, pre-post quasi-experimental design, where the SSL curriculum was implemented for students at two schools in HCSD that were compared against students who did not receive the SSL approach at two other schools in HCSD. In addition, teachers were prompted to self-evaluate in terms of their levels of implementing the curriculum (dosage). This teacher-level variable was used to determine whether levels of program implementation impact student performance over time and to answer/test the quantitative research questions posed by this study.

Prior to analysis, treatment and control group differences on baseline student math performance were tested to establish if there was baseline equivalence. Only 5th graders exhibited a difference between groups on the math performance outcome greater than a standard effects size (ES) of .10. Accordingly, an inverse probability weighting (IPW) procedure was conducted per What Works Clearinghouse (WWC) guidelines (U.S. Department of Education, WWC). For the weighting procedure, propensity scores were estimated using demographic characteristics (gender, race, ethnicity, free or reduced-price lunch, and IEP status) on

treatment and control group membership and these scores were used to develop IPW weights in analysis with the math outcomes to reduce the effects of confounding. In addition, the analysis accounted for the clustering of students nested within schools using a multilevel analysis. These analyses were conducted within-grade levels (3^{rd} – 5^{th}) separately and grade levels overall (combined).

Measures

Student Assessment Data. HCSD administers the i-Ready[1] math assessment to 3^{rd}-5^{th} grade students in the beginning, middle, and end of year. The i-Ready math assessment measures a student's academic growth and proficiency in math. The test is adaptive, indicating that difficulty level may change depending on a student's prior response. The questions cover counting, number operations, fractions, proportional relationships, algebra, geometry, statistics, and probability subjects. The testing process utilizes primarily multiple-choice questions to assess student mastery of concepts. The test consists of 54-72 questions and can take students 30-60 minutes to complete depending on the student's grade level. The *iReady* scoring system uses a scale score, is a measure of performance, and ranges between approximately 100 to 800 with certain scores appropriate for a student's grade level. Higher scores indicate higher proficiency.

Teacher Self-Report Surveys. The purpose of the teacher self-report survey is to assess SSL program implementation fidelity and to understand the extent to which students received program elements from the teacher in the classroom. The teacher implementation fidelity questions encompass implementation frequency, use and procedures, and teacher participation in SSL support services. The implementation frequency was captured asking the teachers the number of school days in the year that SSL was used and the number of SSL lessons per year that were taught. The use and procedures questions asked the participants to rate how much they used SSL or implemented specific program element procedures such as student self-checks, review of difficult problems, and administration of unit quizzes in the classroom. These procedures capture the Spacing, Retrieval, and Interleaving strategies that encompass the SSL program. The use of SSL in class indicator was measured using a 6-point Likert with a low rating indicating "Rarely (less than once a week)" and a rating of 6 indicating "Daily" use. The procedures questions (self-check, review, and unit quiz) were measured using a 5-point Likert with a low rating indicating "Never" implementing the practice in class while a rating of 5 indicating "100%" daily implementation. The teacher participation element was a sum of the number of SSL support services that were provided to aid teachers in understanding and implementing the SSL approach in the classroom. Specifically, whether the teacher attended the SSL professional development kickoff event, the StarCenter online training modules, or had chatted with the SSL customer service representatives to assist them.

> "My instruction has always been intentional. I use Simple Solutions everyday."

[1] The methodology for i-Ready can be found here for more details: https://www.curriculumassociates.com/programs/i-ready-learning/personalized-instruction/mathematics.

Overview of Program Implementation

The Simple Solutions Learning Program involves teachers using a combination of SSL-provided workbooks, digital material (Star Center), and other resources to incorporate the three learning strategies: retrieval practice, spaced repetition, and interleaving.

The Simple Solutions routine incorporates the following daily lessons in the classroom:

1) Students complete one lesson per day as homework or other independent work. The lessons feature retrieval, spacing, and interleaving. Students continually practice what they've learned and "test" themselves in a low-risk setting.
2) Using the Star Center, students self-check their work and, with their teacher, go over items that were challenging. This process delivers meaningful feedback in a timely manner. It uncovers gaps in learning and provides opportunities for intervention. (Self-checking occurs on the same day or the day after the lesson is completed.)
3) Students take a weekly quiz through the Star Center. Consistent and ongoing assessment allows students to show what they know. Teachers monitor students' progress and plan future instruction. Over time, students approach quizzes and tests with greater confidence. This, too, increases academic achievement.
4) Students engage in new learning for the remainder of class. The teacher presents new material using methods and strategies of choice. There is no need to change the way a curriculum is addressed.

> "We begin each day with Simple Solutions. We review and discuss problems that the students have trouble with. I love that it spirals."

Results

Teacher Implementation

This study measured teacher implementation and student exposure of the Simple Solutions approach in the treatment classrooms to assess implementation integrity. The table below presents the average score of the intervention implementation, use and procedures, and participation measures by grade that were captured in the teacher self-report survey. For implementation measures, 5th grade teachers reported substantially less average school days SSL was used in class as well as the average number of SSL lessons per year compared to the 3rd and 4th grade teachers. For use and procedures metrics, the same trend was found with the average frequency of SSL use in class and each of the SSL practices with the 5th grade teachers showing lower average frequency compared to their 3rd and 4th grade colleagues. For example, the 3rd and 4th grade teachers indicated that they had engaged in using SSL in the classroom "Daily" (*M* = 6.0) while the 5th grade teachers engaged in SSL use in the classroom 3 to 4 times a week on average (*M* = 4.5). Similarly, teachers in 3rd and 4th grade instituted the use of the SSL self-check practice 75% to 100% of the time (*M* = 4.5 to 4.7) while 5th grade teachers included it in the classroom 50% of the time (*M* = 3.0) on average. Lastly, there was more average engagement around the SSL support services was similar across each of the grades with teachers averaging at least one support service over the school year. In summary, the teacher self-report measures indicate there was strong implementation integrity for 3rd and 4th grade classes within the treatment schools with partial implementation for the 5th grade classes.

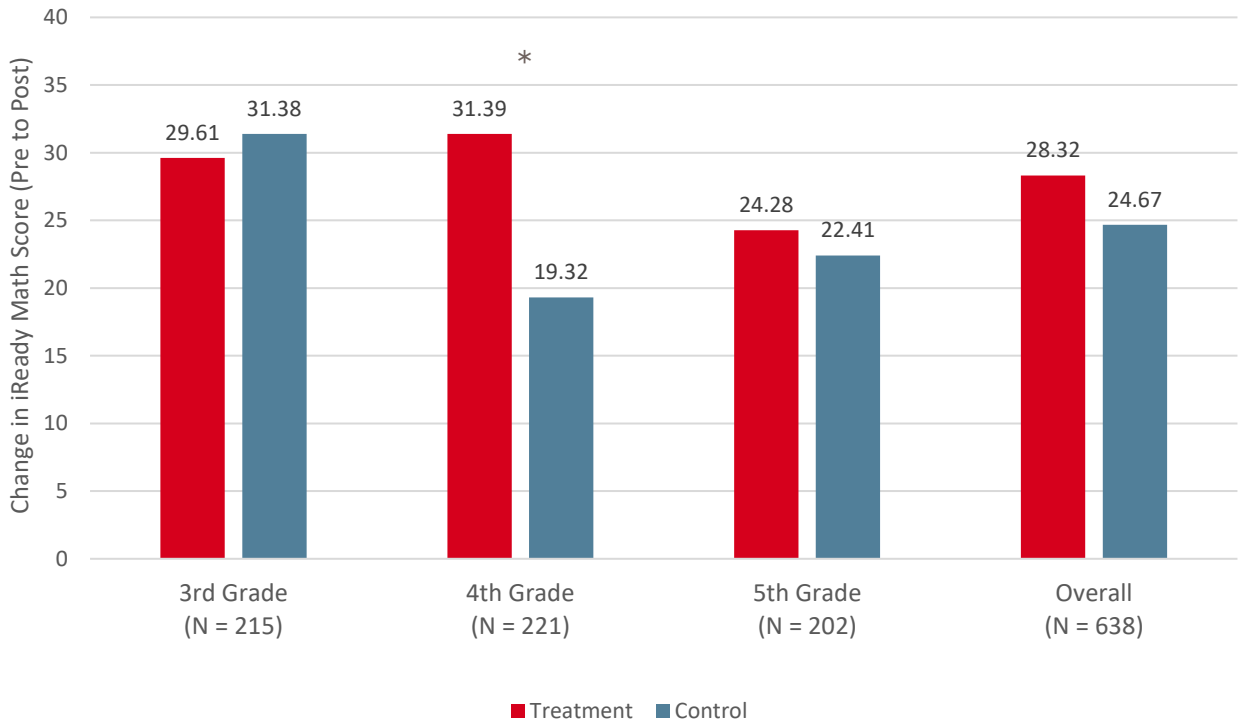
Teacher Measure	3rd Grade (*N*=3)	4th Grade (*N*=2)	5th Grade (*N*=2)
Implementation Frequency			
School days SSL used in class in a year	115.0	128.0	39.5
SSL Lessons per year	108.3	103.5	82.5
Use and Procedures			
SSL use in class	6.0	6.0	4.5
Self-check practice	4.7	4.5	3.0
Review practice	5.0	5.0	3.5
Unit quiz practice	5.0	5.0	3.0
Participation			
Engagement with support services	1.0	1.0	1.0

Note. SSL use in class is a 1 to 6 Likert measure with 1 indicating once every other week use and 6 indicating daily use. All three practices (self-check, review, and unit quiz) were all a 1 to 5 Likert with 1 indicating no use of this practice and a 5 indicating 100% use of this practice. Participation is a sum of the number of teacher support services provided to aid teachers with the software.

> The spiraled curriculum in Simple Solutions has changed how I teach by encouraging me to move away from covering topics in isolation. Now, I weave connections between past and current content into my lessons.

Simple Solutions Impact

The impact of the Simple Solutions approach is presented in the figure below. The *iReady* math score changes from pretest to posttest by grade and overall after controlling for baseline covariates using inverse probability weights indicate that there was a statistically significant improvement in 4th grade math scores for the treatment students (*M* = 31.4) compared to the control students (*M* = 19.3) which translated into a .643 standardized mean difference increase. The 3rd grade assessment found a slight decrease in math scores for treatment students compared to control students (d = -.107) and the 5th grade assessment found a slight increase in math scores for treatment compared to control (d = .119), but in both cases these differences were not statistically significant. Overall, there was an increase in treatment (*M* = 28.3) compared to control students (*M* = 24.7) which translated into a .203 standardized mean difference increase, but was also not statistically significant.



Note. an asterisk (*) indicates statistical significance.

Conclusions

The results of this study indicate that student *iReady* math performance increased from pretest to posttest for 4th grade students that received the SSL approach compared to students that did not receive the intervention. There were no other statistically significant effects. The implementation integrity metrics indicate that there was strong implementation for the 3rd and 4th grade classes with moderate implementation for the 5th grade classes. The results of this study demonstrate that the Simple Solutions approach meets the What Works Clearinghouse ESSA Tier 3 requirements for "Promising Evidence".

> "It has been the **BEST** program that we have ever adopted here. It is easy to use and spirals content so that students are not forgetting the content from earlier in the year. It helps me to look at all the standards vs one area at a time."

Presented By:

ELITE RESEARCH