Reading Horizons

Elmore SCHOOL DISTRICT Research Study

The Impact of *Reading Horizons Discovery®* on K–2 Literacy Outcomes

Elmore School District
2022–2023 Academic Year

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Where reading momentum begins

EXECUTIVE SUMMARY

During the 2022–2023 academic year, Elmore County Schools in Wetumpka, Alabama, implemented the *Reading Horizons Discovery*® (RHD) curriculum with 808 students across 108 classrooms in grades K–2. The *Reading Horizons Discovery*® curriculum features the Reading Horizons® (RH) method based on the science of reading, which delivers engaging, explicit, systematic phonics instruction through a multisensory approach based on Orton-Gillingham principles. Instruction is cumulative and organized in a sequence that enhances learning and simplifies teaching. Each sound of the English language is explicitly taught along with the letter(s) representing the sound. Five Phonetic Skills are taught to help students recognize short and long vowel patterns in words and syllables. Two Decoding Skills are presented to show students how to decode multisyllabic words.

Elmore County Schools, Reading Horizons, Learn Platform, and Arken Research collaborated to evaluate the impact of implementation and student performance as measured by the Reading Horizons Implementation Integrity Rubric (RHIIR) and STAR scores (published by Renaissance Learning, Inc.), respectively.

Using a single treatment, quasi-experimental design with appropriate statistical controls, researchers found that:

1. **Participation in Reading Horizons-facilitated professional learning varied:** Only about 50 percent of teachers participated in one or more coaching days, and only 67 percent or fewer used the self-paced resources. It is hypothesized that greater participation in one or more coaching days and completion of the self-paced online training may have increased the likelihood of implementation integrity in participating classrooms.
2. **Teachers implemented the curriculum with varying levels of integrity:** About three-quarters of teachers (n = 71.3 percent and 75.4 percent, respectively) demonstrated evidence of either "Engaging" (Level 3) or "Empowering" (Level 4) for the indicator of "Effective Communication and Visualization of Key Concepts" (Table 1). However, fewer teachers implemented at Level 3 or 4 for the remaining indicators of an effective RHD implementation (Indicators 2 through 5).
3. **Participation in Reading Horizons-facilitated professional learning had a statistically significant relationship with second-grade literacy outcomes.**
4. **The relationship between implementation integrity and literacy outcomes was moderate to large for grades K–2.** Better implementation of the RH method demonstrated statistically significant results with moderate effects (Cohen's d ranged from .35 to .38) on outcomes, controlling for demographics. Also, in first grade, teachers with an observation score of 3 or higher had students with statistically significantly higher spring STAR Early Literacy oral fluency scores compared to teachers with lower observation scores.

RESEARCH DESIGN

PURPOSE

During the 2022–2023 academic year, Elmore County Schools collaborated with Reading Horizons and third party research teams to study the impact of professional learning participation on the implementation of Reading Horizons Discovery® curriculum, and to explore the relationship between the implementation of the method and student literacy outcomes in grades K–2.

ANALYTIC FRAMEWORK AND DESIGN

Drawing from the contingency framework articulated by Ebrahim (2019), a mixed methods design with a special focus on the *integrity of curriculum implementation* provides a richer understanding of the relationships between resources (curriculum and professional learning) and student outcomes (such as literacy achievement) (Figure 1). Such an approach better helps tell the story of impact of supplemental or partial solutions in complex adaptive systems, and especially in cases where an effect comparing treatment and nontreatment groups may not be detectable.

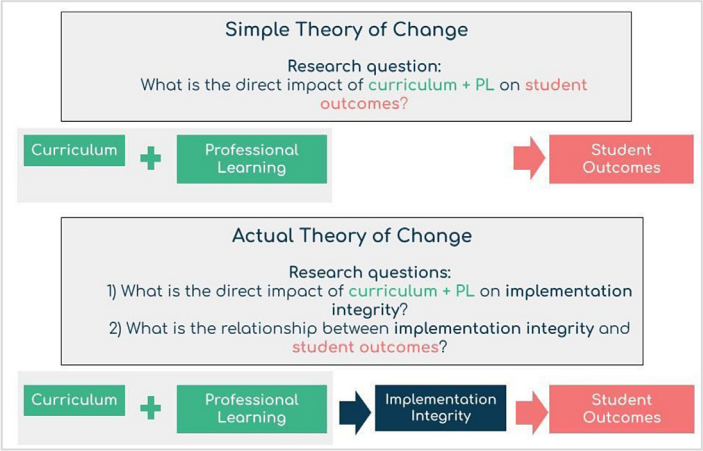

Figure 1. Simple vs. Actual Curriculum and Professional Learning Theory of Change (Arken Research, 2023)

This study employed a single-treatment, pre-post quasi-experimental, mixed-methods design. Researchers used fall 2022 and spring 2023 teacher surveys to measure professional learning participation, and used classroom observations to assess program implementation integrity. Analyses included descriptive statistics, correlations, partial correlations, and multilevel models. Researchers also conducted multilevel models examining the relationships between teacher professional learning, program implementation integrity, and student literacy outcomes, as measured by STAR assessment scores (i.e., STAR Early Literacy scale score and oral fluency score [kindergarten and first grade], STAR Reading scale score and oral fluency score [second grade]).

RESEARCH QUSESTIONS

Professional Learning and Implementation Integrity

1. To what extent did teachers participate in professional learning?
2. To what extent did teachers implement the RHD program with integrity?

Impacts on Student Literacy Outcomes

3. To what extent was teacher participation in professional learning associated with student literacy outcomes?
4. To what extent was implementation of RHD associated with student literacy outcomes?

MEASURES

Professional learning participation—Researchers used a teacher self-report survey to measure professional learning participation as they implemented RHD. Teachers completed the survey in fall 2022 and spring 2023 on their participation in Reading Horizons professional learning and implementation.

Implementation integrity—The Reading Horizons Implementation Integrity Rubric (RHIIR) (Danks, Naylor, & Burwell, 2021) contains five indicators that assess implementation integrity across four levels of practice: Emerging, Exploring, Engaging, and Empowering. The five indicators used included: *1) Effective Communication and Visualization of Key Concepts; 2) Instructional Routines, 3) Questioning and Monitoring, 4) Feedback for Deeper Understanding,* and *5) Pacing and Lesson Structure.*

In the fall of 2022 and spring of 2023, a total of **n = 77 and *n* = 49** teachers, respectively, were observed by Reading Horizons staff who were trained via a series of calibration sessions to ensure consistency and reliability of observations. To measure the implementation of the RH method, classroom observation scores across all five indicators of the RHIIR were averaged. The average teacher observation score was **2.60** (SD = 0.71) on a scale from 1 ("Emerging" instruction) to 4 ("Empowering" instruction).

Student literacy outcomes—Researchers used the STAR Early Literacy (i.e., kindergarten and first grade) and STAR Reading (i.e., second grade) standardized assessments as the student literacy achievement outcome. Both assessments include overall scale scores (all grades) and oral fluency scores (first and second grades only).

OVERVIEW OF PROGRAM IMPLEMENTATION

Elmore County School District is a large suburban public school district in Alabama, serving 11,919 students in pre-kindergarten through twelfth grade. The population is 73 percent White, 21 percent Black or African American, 3 percent Hispanic or Latino, and 2 percent Two or More Races. Approximately 16 percent of families have

income below the poverty level and 86 percent of households have Broadband Internet (NCES, 2021; NCES, 2022). During the 2022–2023 school year, Elmore County Public Schools implemented the direct instruction curriculum and software for the fifth consecutive year. They supported their implementation by offering the Reading Horizons' in-person professional learning to all new teachers and those who needed a refresher. All five elementary schools implemented RHD in grades K–3 as their Tier 1 phonics curriculum. A typical Tier 1 (full class) lesson occurred with the whole class on a daily basis, for approximately 30 minutes, from August through May.

RESULTS

Question 1: To what extent did teachers participate in professional learning?

To understand the professional learning context and how it may have affected implementation integrity, researchers examined how many different professional learning supports teachers reported using during the 2022–2023 school year. The most common support reported was initial training from a Reading Horizons facilitator, reported by 78 percent (*n* = 76) of teachers. The next most used supports—other RHD online resources and videos—were reported by 67 percent (*n* = 66) and 55 percent (*n* = 54) of teachers respectively. The least common supports were professional learning modules (45 percent, *n* = 44) and software training (41 percent, *n* = 40) (see Figure 2).

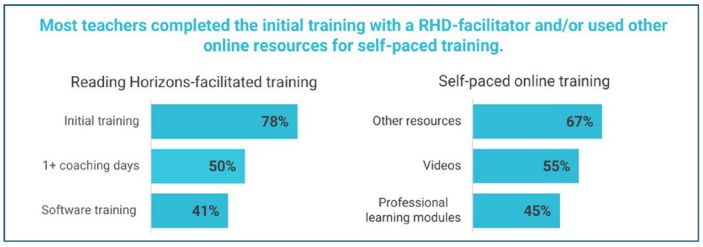

Figure 2. Teacher participation in Reading Horizons professional learning (n = 98). (LearnPlatform, 2023)

These results demonstrate that teachers completed a sufficient amount of professional learning to enable them to effectively implement RHD with fidelity. However, it is hypothesized that greater participation in one or more coaching days and completion of the self-paced online training would have increased the likelihood of implementation *integrity* among participating classrooms.

Question 2. To what extent did teachers implement the RHD program with *integrity*?

While teachers self-reported via the professional learning survey above that they implemented RHD consistently, or with "fidelity," classroom observation scores indicated that teachers implemented RHD with varying levels of *integrity*, as measured by a score of "Engaging" (Level 3) or "Empowering" (Level 4) for each of the five indicators on the RHIIR rubric.

Across all classrooms in the fall and spring semesters in Grades K–2, about three quarters of teachers (*n* = 71.3 percent and 75.4 percent, respectively) demonstrated evidence of either "Engaging" (Level 3) or "Empowering" (Level 4) for the first indicator of "Effective Communication and Visualization of Key Concepts" (Table 1). However, fewer teachers implemented at Level 3 or 4 for the remaining indicators of an effective RHD implementation (Indicators 2 through 5). The indicator in which teachers struggled the most was *Indicator 5—Pacing and Lesson Structure*—an indicator that measures the extent to which teachers were able to effectively complete each of the key components of the Daily Core 4 Lesson Structure. These results showing such variation in implementation integrity suggests that variation in student literacy outcomes is also likely to be expected. *(This also means that the RHIIR measurement tool demonstrated evidence for discriminant validity by generating enough variance for researchers to compare teachers with lower level of implementation to those of higher levels for Research Question 4.)*

Table 1. Distribution of scores for each progression of practice level, fall and spring observations (ARKEN, 2023)

Indicator *(whole sample mean scores)*	Semester	"Emerging" (Level 1)	"Exploring" (Level 2)	"Engaging" (Level 3)	"Empowering" (Level 4)	"Integrity" (Level 3 or 4)
1. Effective Communication and Visualization of Key Concepts	Fall (*n* = 77)	11.6%	16.8%	42.8%	28.5%	**71.3%**
	Spring (*n* = 49)	6%	30.6%	44.8%	18.3%	**63.1%**
2. Instructional Routines	Fall (*n* = 77)	12.9%	31.1%	38.9%	16.8%	**55.7%**
	Spring (n = 49)	6%	65.3%	26.5%	2%	**28.5%**
3. Questioning and Monitoring	Fall (*n* = 77)	24.6%	20.7%	40.2%	14.2%	**54.4%**
	Spring (*n* = 49)	12.2%	40.8%	44.8%	2.0%	**46.8%**
4. Feedback for Deeper Understanding	Fall (*n* = 77)	14.2%	23.3%	32.4%	29.8%	**62.2%**
	Spring (*n* = 49)	4%	38.7%	48.9%	8.1%	**57.0%**
5. Pacing and Lesson Structure	Fall (*n* = 77)	25.9%	18.1%	35.0%	20.7%	**55.7%**
	Spring (*n* = 49)	16.3%	28.5%	55.1%	0.0%	**55.1%**

Question 3: Was teacher participation in professional learning associated with student literacy outcomes?

Participation in Reading Horizons-facilitated professional learning had a statistically significant relationship with **second grade literacy outcomes** ($p < .05$). This means that second graders in classrooms where teachers completed more *Reading Horizons-facilitated professional learning* had higher STAR Reading scale scores and oral fluency scores (Table 2). Also, in first grade classrooms, teacher participation in more *self-paced professional learning* was related to higher spring 2023 STAR Early Literacy oral fluency scores.

No statistically significant correlations were identified for students from kindergarten classrooms. More study is needed to further explore these promising findings, as well as to further understand how professional learning drives better implementation of the curriculum.

*Table 2. Partial correlation coefficients (Hedge's g effect size) comparing participation in RHD professional learning and spring 2023 STAR Early Literacy outcomes. Correlations in **blue** are statistically significant. (LearnPlatform, 2023)*

Measure	Grade K	Grade 1	Grade 2
Completion of RH-facilitated professional learning	Overall Score: -0.03	Overall Score: -0.03 Fluency Score: 0.10	**Overall Score: 0.09** **Fluency Score: 0.09**
Completion of RHD self-paced learning modules	Overall Score: -0.07	Overall Score: -0.07 **Fluency Score: 0.17**	**Overall Score: 0.08** **Fluency Score: 0.09**

Question 4: Was implementation of RHD associated with student literacy outcomes?

To correlate overall implementation with literacy outcomes, an implementation index was first computed using an average of each of the five indicators on the RHIIR. Using these single mean scores, a grouping variable was formed, categorizing each teacher into one of three groups: a "low," "medium," and "high" level of implementation. Observation groups were calculated by LearnPlatform researchers using k-means cluster analyses with the number of groups restricted to three. The algorithm minimizes Euclidian distance between groups by sampling k points of all observations, then iteratively assigns each observation to the nearest center. It then calculates the new center for each cluster as the centroid mean for each cluster's set of observations.

Table 3 illustrates the mean scores and frequency distributions for each implementation group that was created. Teachers grouped in the "low" group scored in the range of **1.00 - 2.20**, teachers grouped in the "medium" group scored in the range of **2.25 - 3.00**, and teachers grouped in the "high" group scored in the range of **3.20 - 4.00**. The greatest number of teachers fell into the "medium" group across all grade levels. This suggests that there were greater differences instructionally between the "low" and "high" implementation classrooms than between the "medium" and either the "low" or "high" implementation classrooms. This lack of normal distribution across all three groups indicates that it may be harder to detect a statistically significant finding with a meaningful effect size when comparing implementation level with student literacy outcomes.

Table 3. Mean scores and frequency distributions for each implementation group (LearnPlatform, 2023)

Grade Level	Total count of teachers observed	Mean Scores for "Low" Group (n = count of teachers)	Mean Scores for "Medium" Group (n = count of teachers)	Mean Scores for "High" Group (n = count of teachers)
K	*n* = 31	1.87 (*n* = 14)	2.70 (*n* = 13)	3.45 (*n* = 4)
1	*n* = 29	1.63 (*n* = 8)	2.75 (*n* = 17)	3.75 (*n* = 4)
2	*n* = 29	1.55 (*n* = 8)	2.76 (*n* = 15)	3.50 (*n* = 6)

Despite the challenges due to unequal groups described above, students in Grades K–2 in classrooms with higher implementation scores performed better on end-of-year STAR assessments than those in classrooms with low implementation scores (Figure 3). This effect size of 0.38 for Grades K–1 means that if a comparison student were placed in a medium or high implementation classroom, they would have been expected to perform 15 percentile points higher than they did. This effect size of 0.35 for second grade students means that if a comparison student were placed in a high implementation classroom, they would have been expected to perform 14 percentile points higher than they did. These results indicate that students in Elmore schools are likely to perform better if placed with a teacher who implements with integrity.

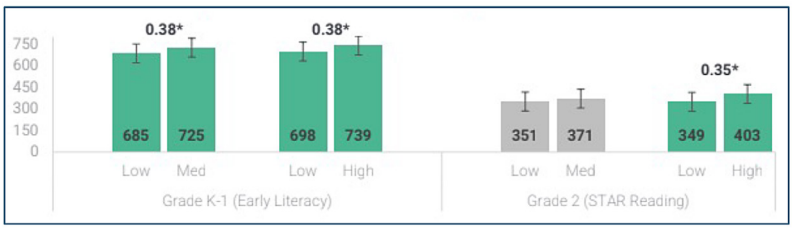

Figure 3. Partial correlation coefficients (Hedge's g effect sizes) of end-of-year STAR assessment scores comparing low and medium implementation classrooms to high implementation classrooms. Correlations in ***green*** are statistically significant. (LearnPlatform, 2023)

CONCLUSIONS

This present study conducted during the 2022–2023 school year revealed several key findings. First, teacher participation in professional learning offerings varied, with initial training by Reading Horizons facilitators being the most frequently attended. Next, there was a positive relationship between teacher participation in Reading Horizons-facilitated professional learning and second-grade students' improved STAR Reading and oral fluency scores. Finally, teachers implement the curriculum with varying levels of integrity. When grouped by their level of implementation (low, medium, and high), stronger implementation resulted in better outcomes for students in grades K–2.

This study provides results to satisfy ESSA evidence requirements for Level III (Promising Evidence) given the study design and positive, statistically significant findings.

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