

## WestEd

# Internet-Based Reading Apprenticeship Improving Science Education (iRAISE)

## DID iRAISE AFFECT CLASSROOM PRACTICES AND STUDENT LITERACY ACHIEVEMENT?

### Project Overview

#### THE PROBLEM: What Challenge Did the Program Try to Address?

Across the country, two-thirds of high school students are unable to read and comprehend complex academic materials, think critically about texts, synthesize information from multiple sources, or communicate what they have learned.<sup>1</sup> At the same time, the Common Core Standards call for all students to demonstrate advanced literacy proficiency not only in English, but also in academic subjects such as science. Unless targeted at the high school level, students can expect to struggle with complex academic texts in secondary and post-secondary education.

#### THE PROJECT: What Strategies Did the Program Employ?

iRAISE, an online version of the existing Reading Apprenticeship approach, was implemented with an i3 development grant<sup>2</sup> from 2012-2016. In science education, the Reading Apprenticeship approach is premised on the idea that to support the shift to Next Generation Science Standards, students need to move beyond memorization of facts and towards a deep understanding of science knowledge and practices. Through Reading Apprenticeship's metacognitive conversations, students were expected to gain the skills needed to move beyond rote interaction with scientific literature to actively building their own knowledge and engaging in science. iRAISE brought Strategic Literacy Institute's 65-hour biology-based, face-to-face literacy professional development to an online format, with the hope of cutting the cost of previous face-to-face training by half. iRAISE was a year-long learning community in which high school science teachers learn about, practice, and

<sup>1</sup> U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP). (2013). *Reading Assessment, Data Explorer Tool*. Retrieval from <http://nces.ed.gov/nationsreportcard/naepdata>.

<sup>2</sup> Development grants provide funding to support the development or testing of novel or substantially more effective practices that address widely shared education challenges. All i3 grantees are required to conduct rigorous evaluations of their projects. The quality of evidence required to demonstrate a project's effectiveness depends on a project's level of scale or grant type.

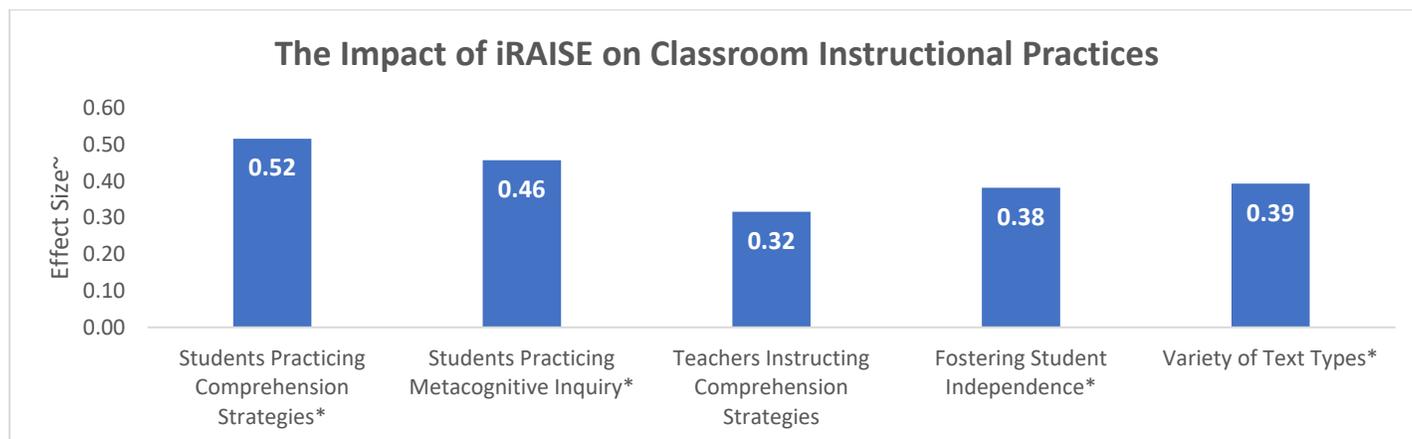
refine ways to improve their students' ability to engage in and understand a variety of scientific texts. iRAISE built from the existing materials, protocols, and key design elements of face-to-face Reading Apprenticeship PD and leveraged interactive, internet-based technologies to enhance teachers' learning. iRAISE was evaluated with a randomized controlled trial in which teachers were randomized to the program or non-program group.

### THE iRAISE Model

- **Summer Training.** iRAISE PD began with a five-day (approximately 20-hour) iRAISE Foundations training during the summer prior to classroom implementation. Each day included four hours of synchronous work with a large group of teachers (roughly 20 in each group), as well as an hour and a half of personal, asynchronous time for reading, reflection, and posting on the discussion board. The iRAISE course was divided between online synchronous sessions with facilitators and peers, and asynchronous assignments that teachers completed on their own.
- **School-Year Meetings.** After the start of the school year, teachers participated in monthly follow-up meetings from September through May, allowing them to continuously implement their learning over the year. The follow-up meetings provided three hours of additional support per month in two different formats: whole-group meetings introducing new learning (Ignite sessions) and small-group meetings intended. The iRAISE course was divided between online synchronous sessions with facilitators and peers, and asynchronous assignments that teachers completed on their own.

## Summary of Results

### DID iRAISE AFFECT CLASSROOM PRACTICES AND STUDENT LITERACY ACHIEVEMENT?



~ Education researchers generally interpret effect sizes as follows: 0.2 = small, 0.5 = medium, and 0.8 = large. If the impact does not have an effect size of 0.2 or greater, it is not meaningful, even if it is statistically significant.<sup>1</sup>

\*Results are statistically significant.

**iRAISE TEACHERS REPORTED IMPROVEMENTS** in several mediating outcomes, including shifts in instructional practice and confidence in literacy instruction. There was no effect on student literacy achievement.

- **CLASSROOM PRACTICES AFFECTED.** The analyses of teacher survey data suggest iRAISE had a statistically significant impact on reported instructional practices in key areas emphasized by the Reading Apprenticeship framework. iRAISE teachers were more likely than control teachers to encourage student-directed learning by using practices that foster student independence, providing opportunities for students to practice various reading strategies, and instructing comprehension strategies. Other statistically significant findings include increases in teacher confidence in literacy instruction, students practicing metacognitive inquiry, and variety of text types used in the classroom (e.g., expository, narrative).
- **STUDENT LITERACY ACHIEVEMENT.** The program had no statistically significant effect on the primary outcome of student literacy achievement.

Please see Appendices A and B for information about the evaluation's design and the quality of the evidence, respectively.

### OTHER CONSIDERATIONS

Study participants attributed the iRAISE program's efficacy to a few program features:

- **COMMITMENT FROM TEACHERS.** iRAISE teachers reported more support for literacy instruction than their control peers and generally held positive views of Reading Apprenticeship and its efficacy. Forty-three percent of iRAISE teachers reported being fully committed to Reading Apprenticeship at the end of the study.
- **FOCUS ON COLLABORATION.** Use of these interactive spaces encourages the collaborative nature of iRAISE, wherein teachers become students and learn alongside each other. The online content itself is presented across multiple platforms, including: BlackBoard Collaborate for synchronous work, Canvas for course management, and YouTube and GoogleDocs for resource storage and sharing.

## For More Information

### Evaluation Reports

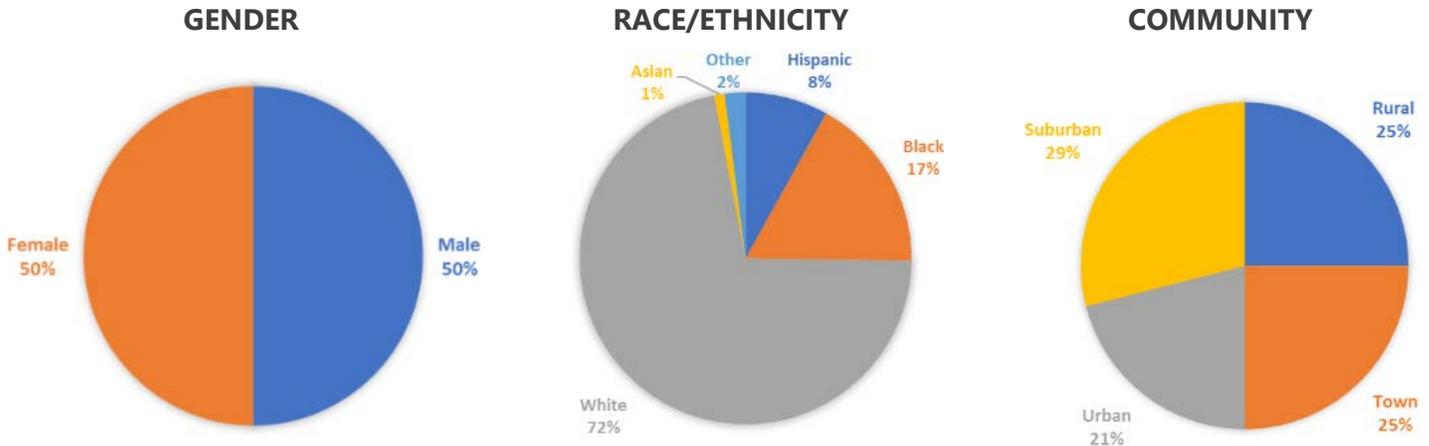
[Final Evaluation Report](#) (Empirical Education, December 2016)<sup>3</sup>

[Interim Report \(ERIC\)](#) (Empirical Education, January 2015)

<sup>3</sup> The information and data for this result summary was collected from the most recent report as of 01/22/2020: Empirical Education. (2016, December). *Effectiveness of Internet-Based Reading Apprenticeship Improving Science Education*. Retrieved from <https://www.empiricaleducation.com/pdfs/iRAISEfr.pdf>

## Appendix A: Students Served by the Project<sup>4</sup>

GRADE(S)													
PK	K	1	2	3	4	5	6	7	8	9	10	11	12



### HIGH-NEED STUDENTS<sup>i</sup>

Free/Reduced-Price Lunch	English Learners <sup>5</sup>	Students with Disabilities
53%	1%	15%

<sup>4</sup>These data reflect the entire student population served by the intervention, not just the evaluation sample used in the impact study.

<sup>5</sup> The report provided a percent of students described as “English speakers.” This value is the inverse of that percent.

## Appendix B: Impact Evaluation Methodology<sup>6</sup>

### RESEARCH DESIGN:

<b>Design:</b>	Cluster Randomized Controlled Trial
<b>Approach:</b>	<ul style="list-style-type: none"> <li>▪ Eighty-two teachers were randomly assigned to either receive the iRAISE professional development or continue with business as usual.</li> <li>▪ This was an intent-to-treat design, with impact estimates generated by comparing student average outcomes for teachers randomly assigned to the iRAISE group with student average outcomes for teachers assigned to control group status, regardless of the level of participation in or implementation of iRAISE instructional approaches after random assignment.</li> </ul>
<b>Study Length:</b>	One year

### DATA COLLECTION AND ANALYSIS

<b>Study Setting:</b>	Twenty-seven public schools in Michigan and Pennsylvania
<b>Final Sample Sizes:</b>	<ul style="list-style-type: none"> <li>▪ <i>Intervention Group</i>: 41 teachers<sup>7</sup></li> <li>▪ <i>Comparison Group</i>: 41 teachers</li> </ul>
<b>Intervention Group Characteristics (Teachers):</b>	<ul style="list-style-type: none"> <li>▪ Mean years of teaching experience: 15.5</li> <li>▪ Mean years of science teaching experience: 14.9</li> <li>▪ Female: 68%</li> <li>▪ Highest degree is bachelor's degree: 21%</li> <li>▪ Highest degree is master's degree: 68%</li> </ul>
<b>Comparison Group Characteristics (Teachers):</b>	<ul style="list-style-type: none"> <li>• Mean years of teaching experience: 13.2</li> <li>• Mean years of science teaching experience: 12.6</li> <li>• Female: 63%</li> <li>• Highest degree is bachelor's degree: 32%</li> <li>• Highest degree is master's degree: 50%</li> </ul>
<b>Intervention Group Characteristics (Students):</b>	<ul style="list-style-type: none"> <li>▪ Free/Reduced Priced Lunch: 54%</li> <li>▪ Individualized Education Program: 16%</li> <li>▪ Female: 50%</li> <li>▪ Black: 17%</li> <li>▪ Hispanic: 9%</li> <li>▪ Other Race/Ethnicity: 4%</li> </ul>

<sup>6</sup> These data reflect only the evaluation sample in the impact study, not the entire population served.

<sup>7</sup> Counts of treatment and control students were not provided. The authors only noted that there was a total of 1,926 students across the two groups.

### Comparison Group Characteristics (Students):

- Free/Reduced Priced Lunch: 53%
- Individualized Education Program: 15%
- Female: 49%
- Black: 18%
- Hispanic: 6%
- Other Race/Ethnicity: 1%

### Data Sources:

- Free/Reduced Priced Lunch: 53%
- Individualized Education Program: 15%
- Female: 49%
- Black: 18%
- Hispanic: 6%
- Other Race/Ethnicity: 1%

### Key Measures:

- Classroom instructional practices
- Measures of how well students read and reason about text sources

## Appendix C: Quality of the Evidence

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Although an evaluation may not have been reviewed by the time of publication for this summary, it is possible that the study will be reviewed at a later date. Please visit the websites found in the footnotes on this page to check for updates.

### WHAT WORKS CLEARINGHOUSE REVIEW<sup>8</sup>

STUDY	RATING
Not reviewed as of 01/22/2020	▪ N/A

### EVIDENCE FOR ESSA REVIEW<sup>9</sup>

STUDY	RATING
Not reviewed as of 01/22/2020	N/A

### NATIONAL CENTER ON INTENSIVE INTERVENTIONS REVIEW<sup>10</sup>

STUDY	RATING
Not reviewed as of 01/22/2020	N/A

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<sup>8</sup> <https://ies.ed.gov/ncee/wwc/FWW>

<sup>9</sup> <https://www.evidenceforessa.org/>

<sup>10</sup> <https://intensiveintervention.org/>

# Investing in Innovation (i3) Grantee Results Summary

Development, 2012-2016

The [\*Investing in Innovation Fund \(i3\)\*](#), established under section 14007 of the American Recovery and Reinvestment Act of 2009, is a Federal discretionary grant program at the U.S. Department of Education within the Office of Elementary and Secondary Education (OESE). i3 grants help schools and local education agencies work in partnership with the private sector and the philanthropic community to develop and expand innovative practices that improve student achievement or student growth, close achievement gaps, decrease dropout rates, increase high school graduation rates, and/or increase college enrollment and completion rates for high-need students.

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<sup>i</sup> “High-need student” refers to a student at risk of academic failure or otherwise in need of special assistance and support, such as students who are living in poverty, attend high-minority schools, are far below grade level, who have left school before receiving a regular high school diploma, at risk of not graduating with a diploma on time, who are homeless, in foster care, have been incarcerated, have disabilities, or who are English learners. For more information see: [\*Applications for New Awards; Investing in Innovation Fund-Development Grants, 81 FR 24070 \(April 25, 2016\)\*](#).