Effectiveness of Internet-Based Reading Apprenticeship Improving Science Education (*iRAISE*)

A REPORT OF A RANDOMIZED EXPERIMENT IN MICHIGAN AND PENNSYLVANIA

In 2012, WestEd received a "Development" grant from the U.S. Department of Education's Investing in Innovation (i3) competition to develop and implement Internet-based Reading Apprenticeship Improving Science Education (*iRAISE*). *iRAISE* was implemented in Michigan and Pennsylvania and was provided to over 100 teachers who served approximately 20,000 students during the grant period. This report presents findings from the randomized control trial of *iRAISE*, which took place during the 2014-15 school year and investigated the impact of the program on teacher and student outcomes.

OVERVIEW OF THE INTERVENTION. *iRAISE* brings Strategic Literacy Institute (SLI)'s 65-hour biology-based, face-to-face literacy professional development (PD) to an online format, with the hope of cutting the cost of previous face-to-face training by half. *iRAISE* is a year-long learning community in which high school science teachers learn about, practice, and refine ways to improve their students' ability to engage in and understand a variety of scientific texts. *iRAISE* builds from the existing materials, protocols, and key design elements of face-to-face Reading Apprenticeship PD and leverages interactive, internet-based technologies to enhance teachers' learning. The course is divided between online synchronous sessions with facilitators and peers and personal, asynchronous work. The PD begins with a 5-day (approximately 20-hour) *iRAISE* Foundations training during the summer prior to classroom implementation. After the start of the school year, teachers participate in monthly follow-up meetings from September through May, allowing them to continuously implement their learning over the year. The follow-up meetings provide three hours of additional support per month in two different formats: whole-group meetings introducing new learning (Ignite sessions) and small-group meetings intended to produce discussion and collaboration (PLC sessions). Through the development grant funding, SLI aimed to create a flexible, accessible, and high-quality online professional learning platform, while preserving the interactive, engaging character of face-to-face Reading Apprenticeship PD.

The full report is available at www.empiricaleducation.com/pdfs/iRAISEfr.pdf

RESEARCH DESIGN. The i3 evaluation of *iRAISE,* conducted by Empirical Education Inc., employed a cluster randomized control trial in which 82 teachers were randomly assigned to receive the *iRAISE* PD (41 teachers) or continue with business-as-usual (41 teachers). 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.

This report presents key implementation and impact findings from the i3 impact evaluation of the *iRAISE* project. Data sources for this report include teacher surveys; PD observations and attendance records; school district student records; and an assessment of students' literacy skills.

KEY FINDINGS ABOUT RAISE IMPLEMENTATION. Implementation and contextual factors that may have facilitated or hindered implementation of *iRAISE* were measured through PD observations and attendance records, teacher surveys, and principal surveys. The following data indicated that *iRAISE* PD and in-school support were delivered as intended.

- Over 90% of the observed PD sessions exhibited the five key design characteristics.

- 32 out of the 33 teachers who agreed to participate in the PD attended at least four days of the Foundations training, with 26 of those attending all five days. However, eight teachers randomized to the *iRAISE* group did not attend any of the PD: one teacher left his teaching position, two teachers declined to participate in the study shortly after randomization, and five teachers agreed to data collection but declined the PD because of other obligations.

- Over 80% of teachers (*n* = 27) who responded to survey questions about the *iRAISE* PD after attending felt that it "moderately", "more than moderately", or "completely" prepared them to use the set of literacy practices modeled during the training.

iRAISE teachers reported more support for literacy instruction than their control peers and generally held positive views of Reading Apprenticeship and its efficacy. Their survey responses indicated buy-in and commitment to implementing the framework.

- *iiRAISE* teachers reported receiving support for literacy instruction at a greater frequency than control teachers, and they rated this support as "very" or "more than moderately" helpful at higher levels than control teachers.

- 43% (*n* = 13) of teachers reported being fully committed to Reading Apprenticeship at the end of the study.

However, implementation was not without challenges, with most teachers (over 60%) reporting competing priorities that hampered implementation, such as standardized test preparation or addressing content standards.

KEY FINDINGS: CLASSROOM PRACTICE. Monthly teacher surveys measured the extent to which *iRAISE* had an impact on teacher mediating outcomes, including shifts in instructional practice and confidence in literacy instruction. *iRAISE* had significant impacts on teachers' use of certain core Reading Apprenticeship practices and on their confidence in delivering literacy instruction with effect sizes (ES) ranging from 0.236 to 0.619. The following were areas of impact.

- Teacher confidence in literacy instruction, ES = 0.619, *p* = .004

- Students practicing comprehension strategies, ES = 0.516, *p* = .001

- Students practicing metacognitive inquiry, ES = 0.457, *p* = .003

- Variety of text types, ES = .393, *p* = .033

- Fostering student independence, ES = 0.382, *p* = .034

- Traditional instructional strategies, ES = 0.329, *p* = .066

- Teachers instructing comprehension strategies, ES = 0.316, *p* = .04

- Student collaboration, ES = 0.285, *p* = .129

- Teachers modeling metacognitive inquiry, ES = 0.250, *p* = .086

- Teachers modeling comprehension strategies, ES = 0.243, *p* = .100

- Teachers instructing metacognitive inquiry, ES = 0.236, *p* = .095

The analyses of teacher survey data suggest *iRAISE* had an impact on reported attitudes and 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 offering opportunities for peer-to-peer learning and collaboration.

KEY FINDINGS: STUDENT LITERACY ACHIEVEMENT.

Student literacy achievement was measured through an online, scenario-based assessment that was developed by Educational Testing Service (ETS) as part of the Reading for Understanding grant funded by the Institute for Education Sciences. The assessment was designed to measure the strategic reading processes that are primary targets of Reading Apprenticeship and closely aligned with the Common Core State Standards. The assessment was designed to be a more rigorous measure of complex reading comprehension than typical state English Language Arts tests. While there was no impact of *iRAISE* on general reading literacy, we did find a differential impact of *iRAISE* based on prior student achievement, favoring students with lower incoming achievement. No differential impact was observed across other student subgroups. Also, based on a correlational analysis, we did not observe a relationship between the posited mediating outcomes and student achievement.

CONCLUSIONS.

After a one-year implementation with *iRAISE,* we do not find an impact of the program on student achievement. However, we do find that the impact of *iRAISE* on general reading literacy increases with lower incoming achievement. This echoes prior research, as a previous study found effects on student achievement for students reading two to five years below grade level (Kemple et al., 2008). Additionally, we found a positive effect on classroom instructional practices, which replicated the results from the prior RAISE study, with significant impacts on fostering student independence, teachers instructing comprehension strategies, students practicing comprehension strategies, students practicing metacognitive inquiry, use of a variety of text types, and teacher confidence in literacy instruction. These findings are consistent with specific intended goals of *iRAISE*: to provide a high-quality online training that impacts teaching.