



The Importance of Participating in Education Research

Education Innovation and Research Webinar Series

April 8, 2025



Table Setters



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Today's Panel



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Rhode Island Department of
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Today, our panelists will discuss...

The value and importance of participating in education research

Ways to address potential obstacles to gaining greater participation in education research



Agenda

Opening Remarks from the EIR Program Office

Research Participation Considerations

EIR Projects' Approaches to Research Participation

Discussion

Closing Remarks



USING AND BUILDING EVIDENCE



EXPLORE new ways of addressing persistent challenges that other educators can build upon.



SUSTAIN, REPLICATE AND SCALE successful evidence-based practices in new schools, districts, and States, while addressing the barriers to scale, like cost-effectiveness and implementation fidelity.



BUILD THE EVIDENCE based on effective educational practices to improve achievement for high-needs students.



A TIERED EVIDENCE GRANT PROGRAM

	<u>Early-Phase</u>	<u>Mid-Phase</u>	<u>Expansion</u>
Level of Innovation/ Scale	Develops and tests innovative education practices	Refines innovative education practices at a regional or national scale	Scales innovative education practices nationally
Evidence	Demonstrates a Rationale (high quality research findings of an evaluation)	Moderate Evidence	Strong Evidence
Grant Amount	Up to \$6 Million	Up to \$10 Million	Up to \$15 million
Anticipated Award	13-23 awards	8-15 awards	4-8 awards

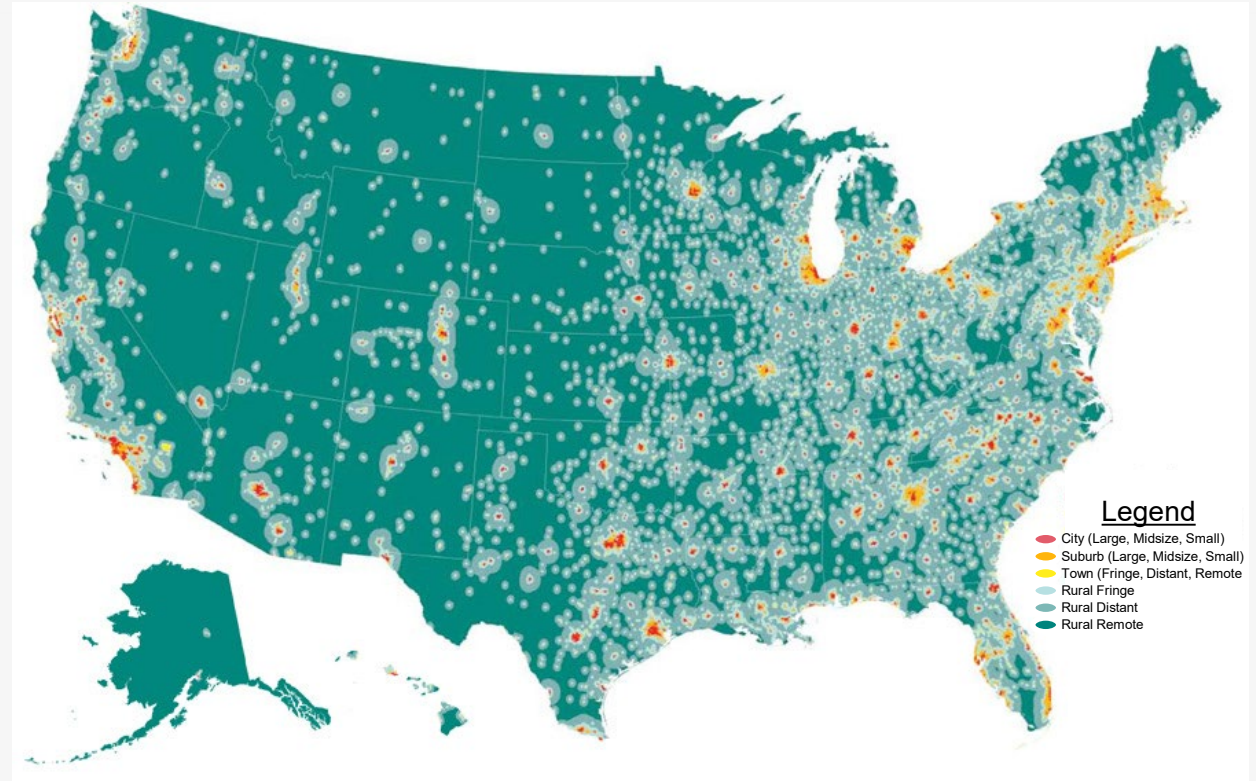


Place Matters for Education Research: The Importance of the Rural Context

About 1/5 of students, 1/3 of schools and 1/2 of districts are rural, yet education research often does not explicitly address the unique needs and contexts of rural schools

One of many definitions:

- Urbanized Areas (UAs) of 50,000 or more people
- Urban Clusters (UCs) of at least 2,500 and less than 50,000 people.
- Rural encompasses all population, housing, and territory not included within an urban area or cluster



<https://nces.ed.gov/programs/maped/LocaleLookup/>



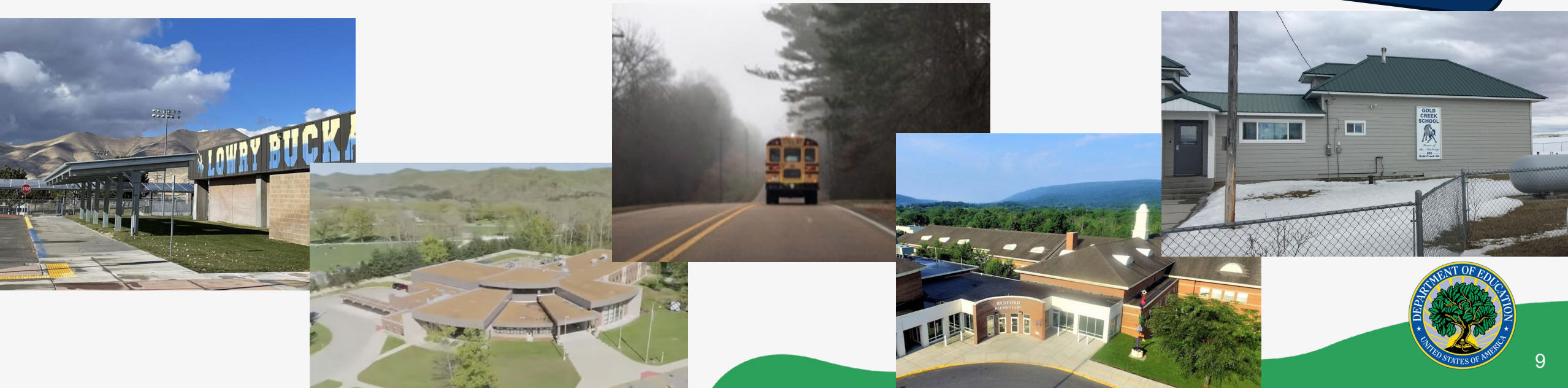
Place Matters for Education Research: The Importance of the Rural Context

There is a need for:

- **Research that addresses place/context:** Scholarship that leverages assets and addresses unique needs of particular contexts
- **District and school participation in research:** Increased participation in all phases of research from defining problems to developing interventions to data collection and analysis to sharing findings and dissemination—particularly for schools that have traditionally been underrepresented

Not all
interventions
work in all
contexts

One “Evidence-Based”
Writing Prompt: Describe how
immigration has changed
your neighborhood





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2022-2027 NATIONAL RURAL RESEARCH AGENDA

The National Rural Education Association (NREA) is pleased to launch its 2022-2027 Research Agenda. A wide variety of stakeholders across the country were invited to provide their perspectives on the strengths and needs of rural schools. This agenda is designed to increase educational equity and opportunity for rural students across the country while highlighting the many strengths of rural schools and communities.

NREA Research and Higher Education Subcommittee: Catharine Biddle, Pamela J. Buffington, Sara L. Hartman, Erin McHenry-Sorber, J. Kessa Roberts, Sarah Schmitt-Wilson



NREA Call for research that centers spatial and educational equity across and within geographies



How place matters in the rural context . . .

Some or all of these may be relevant:

- Smaller schools and class sizes
- Geographic distance (transportation, access)
 - Distance from research entities/universities
- Isolation/Tight knit communities
- Resilience and local cultures
- Diverse and changing demographics
- Essential role of schools in local community (social, economic)
- Access to resources (poverty, local tax base)
- Place-based resources for teaching and learning
- Faculty and staff wear multiple hats
- Teacher workforce challenges lead to unique staffing solutions(e.g., under-certified, international, hybrid)
- Broadband access
- Mission to serve kids and families

What's relevant in the contexts where you work?

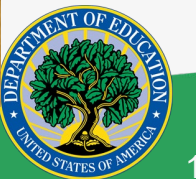
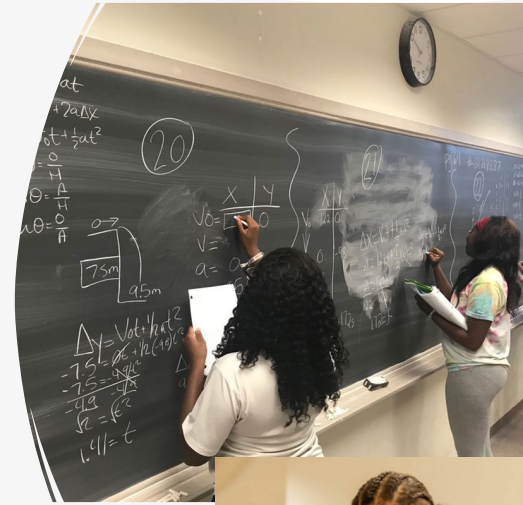


Place and Space in Education Research:

Partnering in (Rural) Research to Address the Needs of All Students

EIR aims to address a need for more and better evidence across rural, urban, suburban, tribal, and other diverse contexts:

- Access and building trust
- Partnerships and collaboration (doing research with and not for)
 - Navigating multiple administrations and school boards
 - Adapting methodology for size and location
- Asset vs. deficit-based perspective (research to understand and support, not fix)
- Rural “salience”—how and why do place matter in the research question, methods, and findings
- Methodological design—
 - For EIR, rural schools fall under the NCES locale codes of 23, 33, 41, 42, and 42 for small town and rural schools
 - Costs, time, etc.
 - Anonymity and confidentiality
 - Adapting to local contexts, leveraging local resources



Experiencing STEM FirstHand

The Impact of a Novel Approach to Bolstering Scientific Identity, Interest, and Knowledge in Middle School Students from Systemically Under-Resourced Communities

An FY21 Early-phase Education Innovation Research Grant



The University City Science Center leads the project.



Dr. Kristin Gagnier & Dr. Laura Holian with AnLar are principal investigators (PI) on the award.



LEHMAN
COLLEGE

CUNY

Dr. Steven Holochwost (FirstHand's evaluator since 2014) is now at CUNY Lehman College. Dr. Holochwost is a PI on the award and leads data analysis.



The Science Center's FirstHand Program

Aims to advance evidence-based STEM educational practices for low-income students of color through immersive, inquiry-based experiences in an out-of-school laboratory setting.



Objective 1

Engage underserved, middle school students in

- Hands-on, discovery-based STEM experiences
- An immersive, place-based learning environment
- Industry-relevant mentoring

Objective 2

Conduct a formative evaluation to collect baseline data and refine program delivery

- Tracking fidelity
- Understanding FirstHand
- Improving FirstHand



Objective 3

Conduct a summative evaluation to demonstrate the effectiveness of the program on students'

- **Sense of belonging** in science
- **Valuing** of science
- **Self-efficacy** in science
- **Achievement** in science



Participating in Innovative Education Research



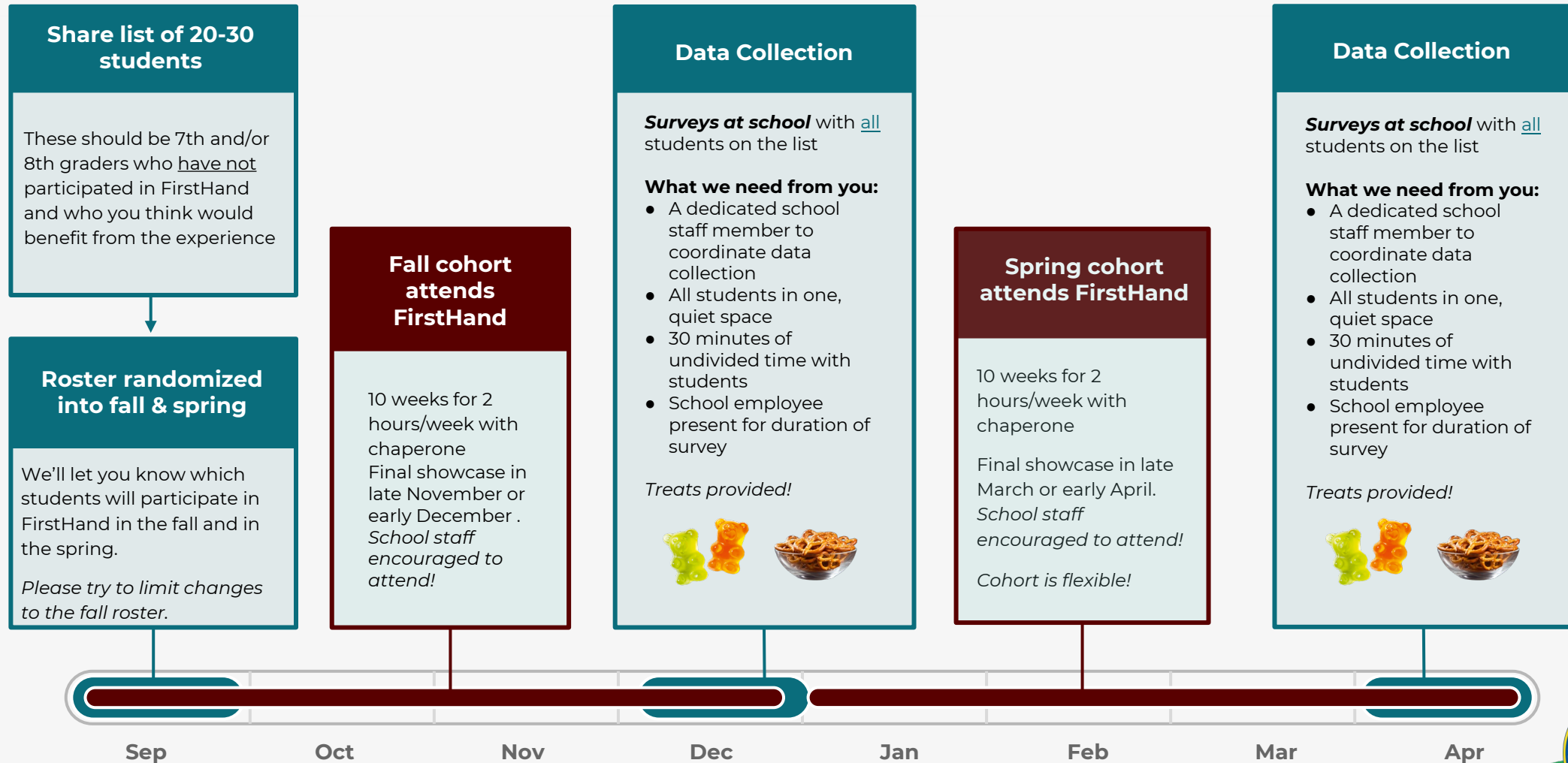
Value to FirstHand

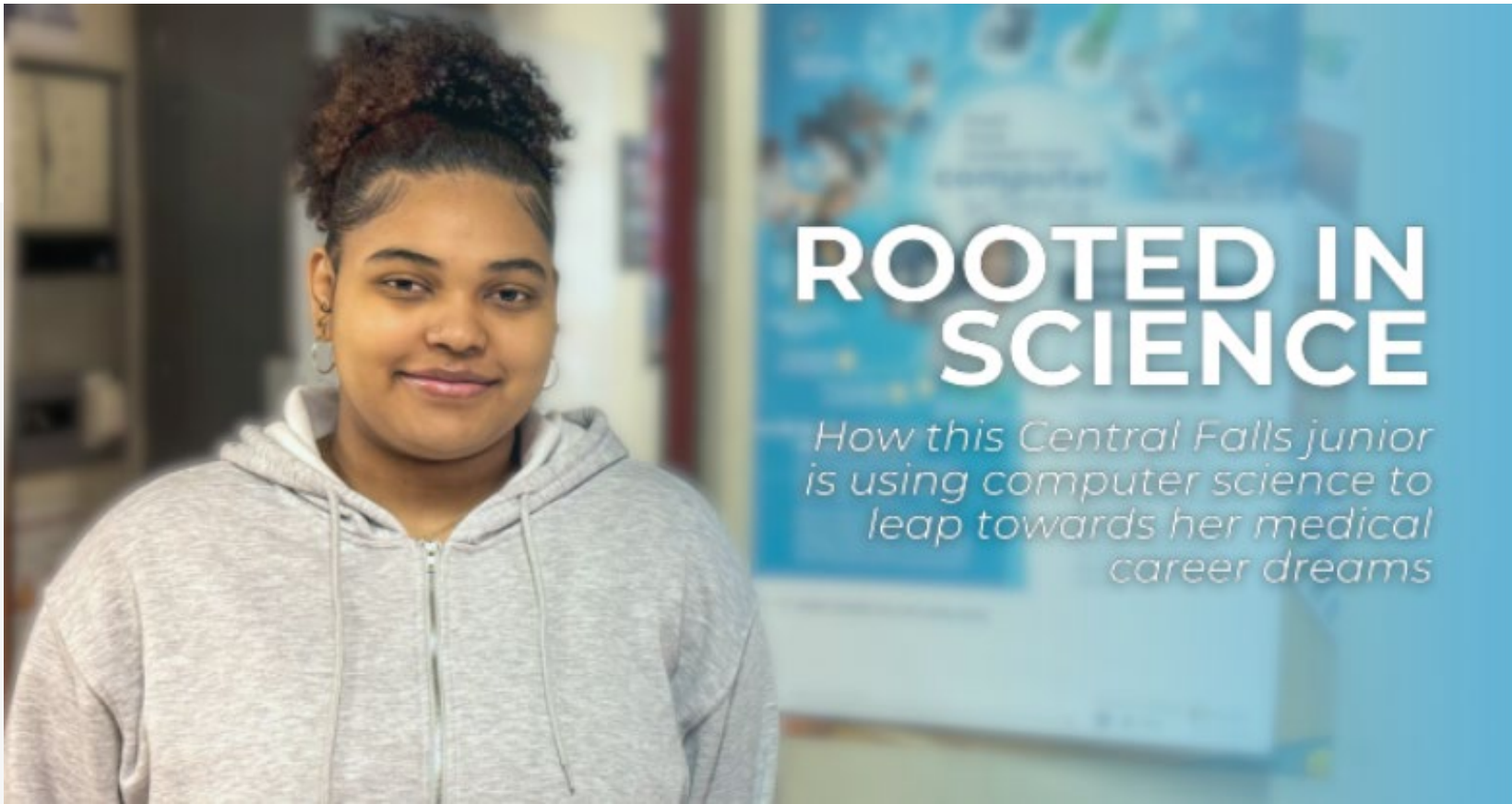
- Opportunity to **validate and expand** this approach to STEM education as an effective model for informal STEM education, especially with students in communities underrepresented in STEM
- Formative evaluation allows for **rapid iterations and improvements** from diversity of stakeholder feedback
- Strong researcher-practitioner partnerships results in research that can **better accommodate** school/program needs

Value to FirstHand Students/Schools/District

- School leaders can more easily **justify participation** in innovative programs when they are backed by research
- Continuous formative feedback allows each new cohort to receive a **slightly better version** of the program
- More participation in education research **builds infrastructure and data collection muscle** at district level

Making Data Collection More Digestible





Rhode Island Department of Education

CS4RI: The Effectiveness of Work-Based Learning in Computer Science Education



Statewide Impact

Rhode Island makes computer science a graduation requirement in 2022, to begin with the Class of 2028!



HS CS WBL EIR Grant Overview

GRANT DETAILS

20

20 schools implement a computer science 3-course sequence

Intro to Computing



AP CS Principles



AP CS A

10

10 of the schools introduce an innovative new computer science work-based learning course in 10th grade that includes 80 hours of work-based learning and a structured industry mentorship



All participating teachers receive free professional development for all courses



Students have the opportunity to earn 12 college credits at no cost



Each of the 20 schools receive funding to establish 21st century computer labs

The CS4RI High School Grant – \$2.5 Million + 1 Million continuation award

- Award received in 2019
- 20 Rhode Island High Schools
- Strengthen and expand computer science pathways
- Increases participation of historically underrepresented groups in the field of computing
- Research grant
 - Studies the impact and implementation of work-based learning on students' understanding and interest in CS
 - Work-based learning is a course



HS CS WBL EIR Grant Pathway

Grade Level	Control	Treatment
10 th	Intro to Computing and Data Science ↓	Intro to Computing and Data Science <i>+Work-Based Learning for CS</i> ↓
11 th	AP CSP ↓	AP CSP ↓
12 th	AP CSA (Optional) <i>Work-Based Learning for CS (Optional)</i>	AP CSA (Optional)

Research questions of implementation:

1. Is the WBL intervention implemented with *fidelity*?
2. To what extent does implementation *vary* across schools?

Research questions of impact:

1. Does WBL influence students' CS *proficiency* or *AP CS Principles course completion*?
2. Does WBL influence *engagement*, *career intentions*, or *CS interest*?



Work Based Learning Course

- ❑ Sophomore year – 2nd semester CS WBL course is an Industry Project
- ❑ Students learn the software development process in class and program a website for their project
- ❑ The project is performed in teams of 5-6 students, each team with an industry mentor.
- ❑ WBL course is comprised of 5 units that cover each phase of the development process.
 - ❑ Ideation, Design, Implementation, Testing, Presentation

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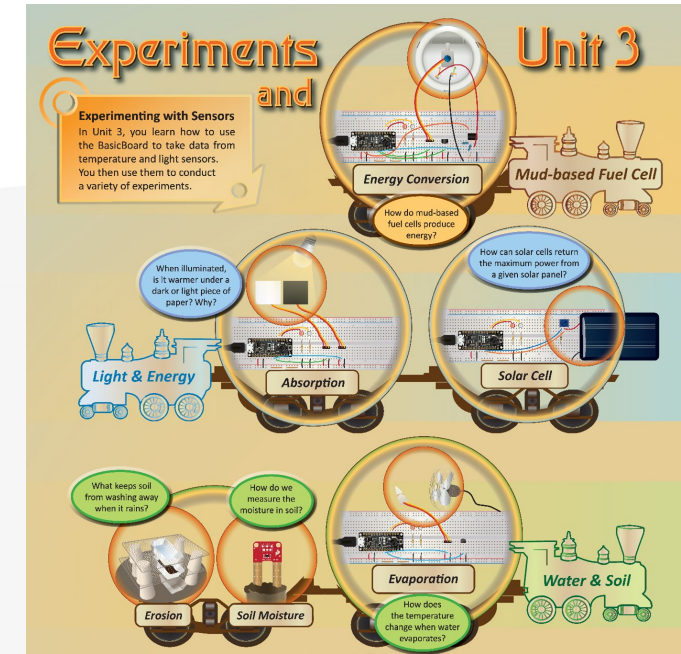
Early Results

- ❑ 97 teachers trained in grant computer science courses.
- ❑ 1080 students have entered the CS pathway since the start of the grant. Of those **81%** of students are from underrepresented groups, which surpassed our goal of 50% of students coming from underrepresented groups.
- ❑ Students in both the treatment and comparison groups performed **statistically similar** on the AP CS Principles exam.
- ❑ Students in both groups completed the course (i.e. earned credit) in AP CS Principles at **statistically similar rates**.
- ❑ When comparing both groups, students who experienced the WBL course:
 - ❑ were **more engaged** in their AP CS Principles course, as measured by a student survey.
 - ❑ Had similar rates of **attendance**
 - ❑ Had similar intentions about **CS careers** at the start of AP CS Principles
 - ❑ Had similar **interest levels** at the start of AP CS Principles.
- ❑ CS4RI was born. An increase of 45% of public high schools offering AP CS Principles
- ❑ An increase of 191% in the number of public high school students enrolled in AP CS Principles
- ❑ 1414 students enrolled in the University of Rhode Island concurrent enrollment course Intro to Computing and Data Science

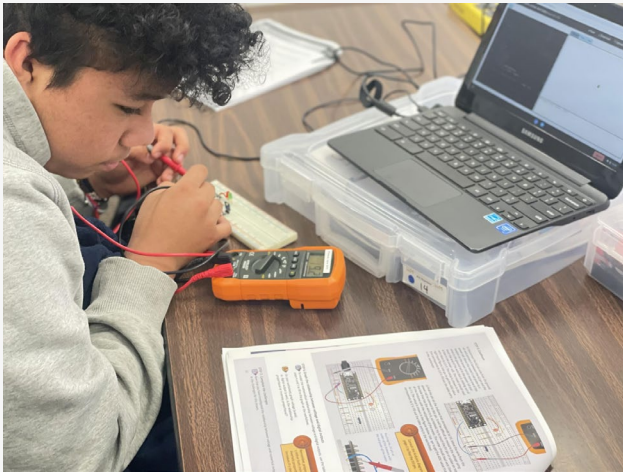


Learning by Making (2013-2024)

- Integrated Computer science and STEM (CSTEM) year-long curriculum for 9th grade in CA rural and/or economically-disadvantaged schools
- On-demand technology support and eighty hours of professional development
- 2013-2024 technology development resulted in an easy-to-use, stable coding and hardware platform.
- ***Research done in 2013-2018 has been shown to improve grades in science and math (Li 2018).***



Learning by Making Classroom Poster



Students working on hardware and coding in science classes in Northern California



Teachers working together using the Learning by Making technology, engineering, and coding platform.

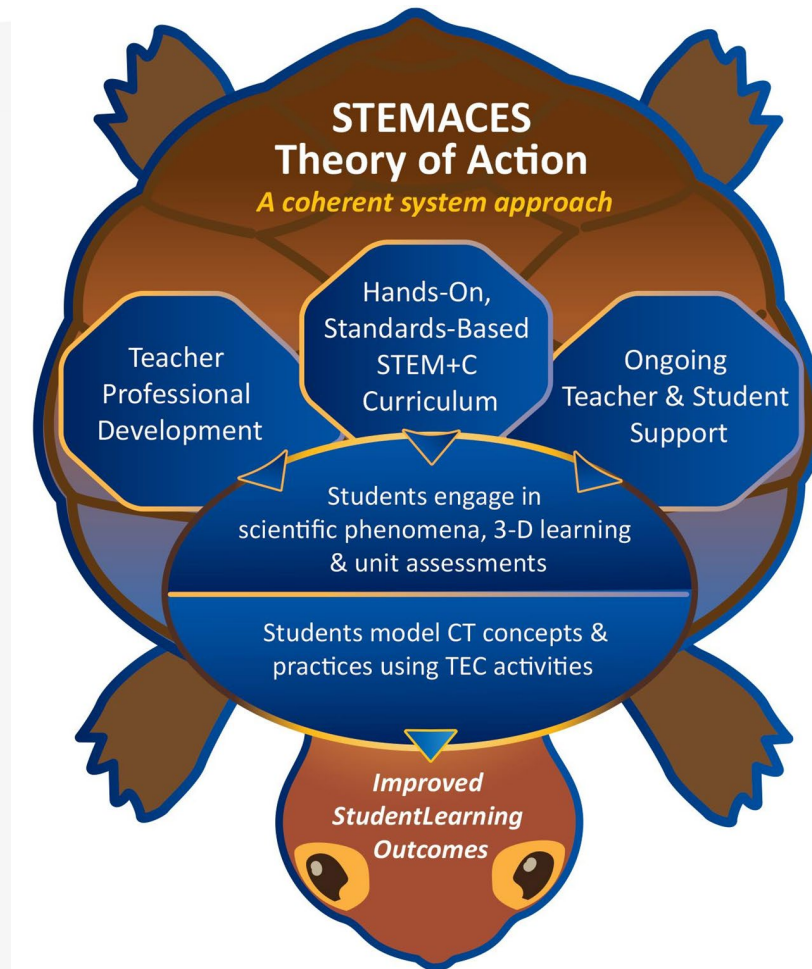
Grant numbers: U411C180146 and U411C120090



STEMACES Model

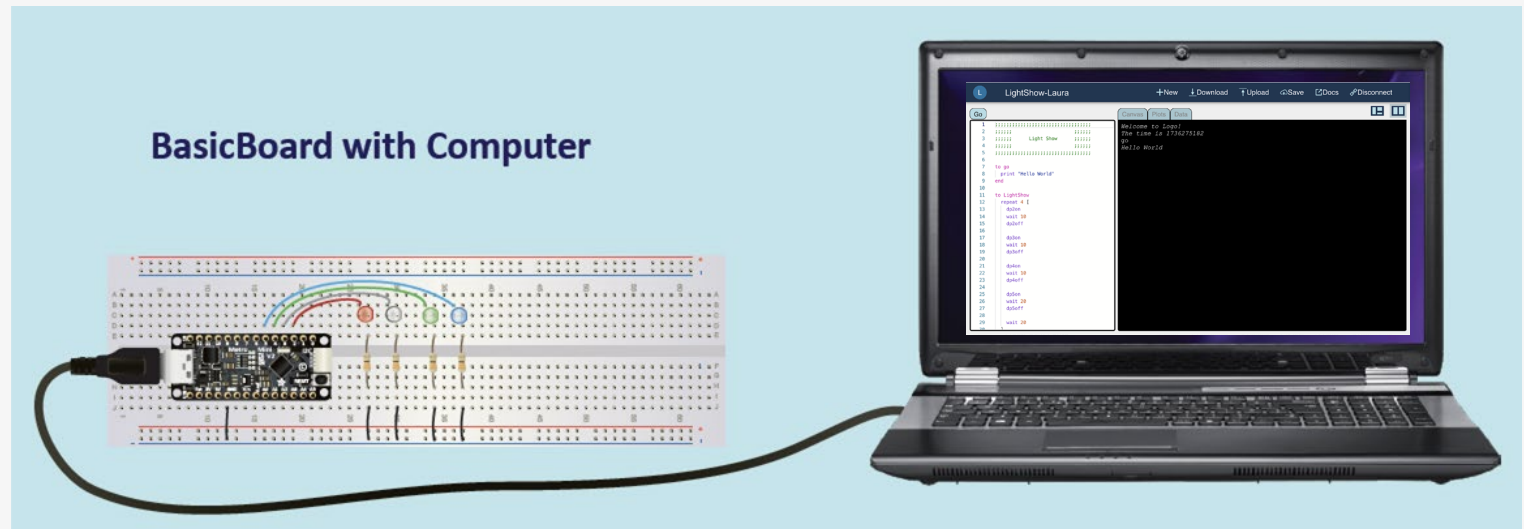
- **GOAL:** Scale an innovative, research-based Science, Technology, Engineering Mathematics, And Computing Education Support (STEMACES) model for improved science learning
- Rural, high-need schools in California and Texas
- Technology, Engineering, and Coding (TEC) activities support students in planning and conducting their own investigation in eighth-grade science courses
- Paid professional learning for teachers
 - Technology, Engineering, and Coding (TEC) content
 - Using TEC activities to plan and conduct investigations
 - How to integrate TEC content into existing curricula
 - How to assess TEC learning
- Ongoing teacher & student support provides teacher-requested support on an as-needed basis.
- Computational thinking assessment for science courses will be validated across other programs.

Grant number: S411B230042



STEMACES Research (2025-2028)

- STEMACES “mid-phase” effort was built on existing evidence
 - The “early-phase” work in 2012-2018 has been shown to improve grades in science and math (Li, 2018);
 - Hands-on, inquiry-based, standards-based curriculum along with on-going teacher professional support provided by “master” teachers will improve students’ science learning (Scheider et al., 2022; Newman et al., 2012)
- STEMACES will implement a randomized control study to test whether our theory of action can benefit a wider audience.
- 80 middle schools participate in two cohorts over 3 academic years.
- Treatment and delayed-treatment science teachers receive model supports
- Expected mediators include positive feelings, such as “Teachers grow their confidence in coding, designing circuits, and recording and analyzing data within their expertise in science teaching.”





Conversation with the Panel



Closing Remarks

Resources from Today's Session

- U.S. Department of Education EIR Program – EIR@ed.gov
- [K-12 STEM Education and Workforce Development in Rural Areas](#)
- [CS4RI](#)
- [National Rural Education Association Research Agenda](#)
- [Bloomsbury Handbook of Rural Education in the United States](#)
- [The Rural Educator](#)
- [The Middle of Somewhere: Rural Education Partnerships and Innovation](#)
- [Journal of Research in Rural Education](#)
- [Theory and Practice in Rural Education](#)





Thank You!