Welcome to the EIR Project Directors and Evaluators Technical Assistance Meeting!

Advancing STEM and CS Integration through Partnerships and Professional Development

Advancing Rural Computer Science U411C190032

October 18th, 2022

Session Overview

In this panel discussion, participants will hear various perspectives on professional development, computer science (CS) integration, and participant recruitment in one early-phase project.

The panel will describe innovative practices including a two-phase PD model that responds to rural schools' COVID-era needs for flexible facilitated and self-directed learning, the development and release of microcredentials that allow educators to receive recognition for standards-based competencies in CS integration and evolving post-pandemic methods for recruiting and retaining multiple cohorts of participants.

The panel includes representatives from the Advancing Rural Computer Science project's implementation team, PD providers, recruitment team, external evaluator, and partnering Department of Education.

Advancing Rural Computer Science

1. Produce a cadre of qualified educators with computer science microcredentials who will build school-level capacity in computer science instruction;
2. Develop accessible, field-tested instructional materials that (a) integrate computer science curriculum standards into core elementary subject areas, and (b) use student performance assessments as a tool for evaluating the impact of doing so;
3. Increase affective and cognitive readiness for pursuing rigorous STEM and computer science coursework among students from high needs and underrepresented groups;
4. Establish high-quality evidence that will support ARCS program sustainability and expansion.

Application and assignment → Code VA Coaches Academy → Learning Bytes and Newsletters → Classroom Resources → CS Integration Microcredentials

The Panel

Dr. Joanna K. Garner, PI and ODU

Dr. Shanan Chappell Moots, Co-PI and ODU

Dr. Joe Brobst, Co-PI and ODU

Dr. Venicia Ferrell, SP and ODU

Keisha Tennessee, SME and VDOE

Natalie Rhodes, SME and Code VA

Dr. Desh Ranjan, SME and ODU

Dr. Jennifer Maeng, External Evaluation and UVa

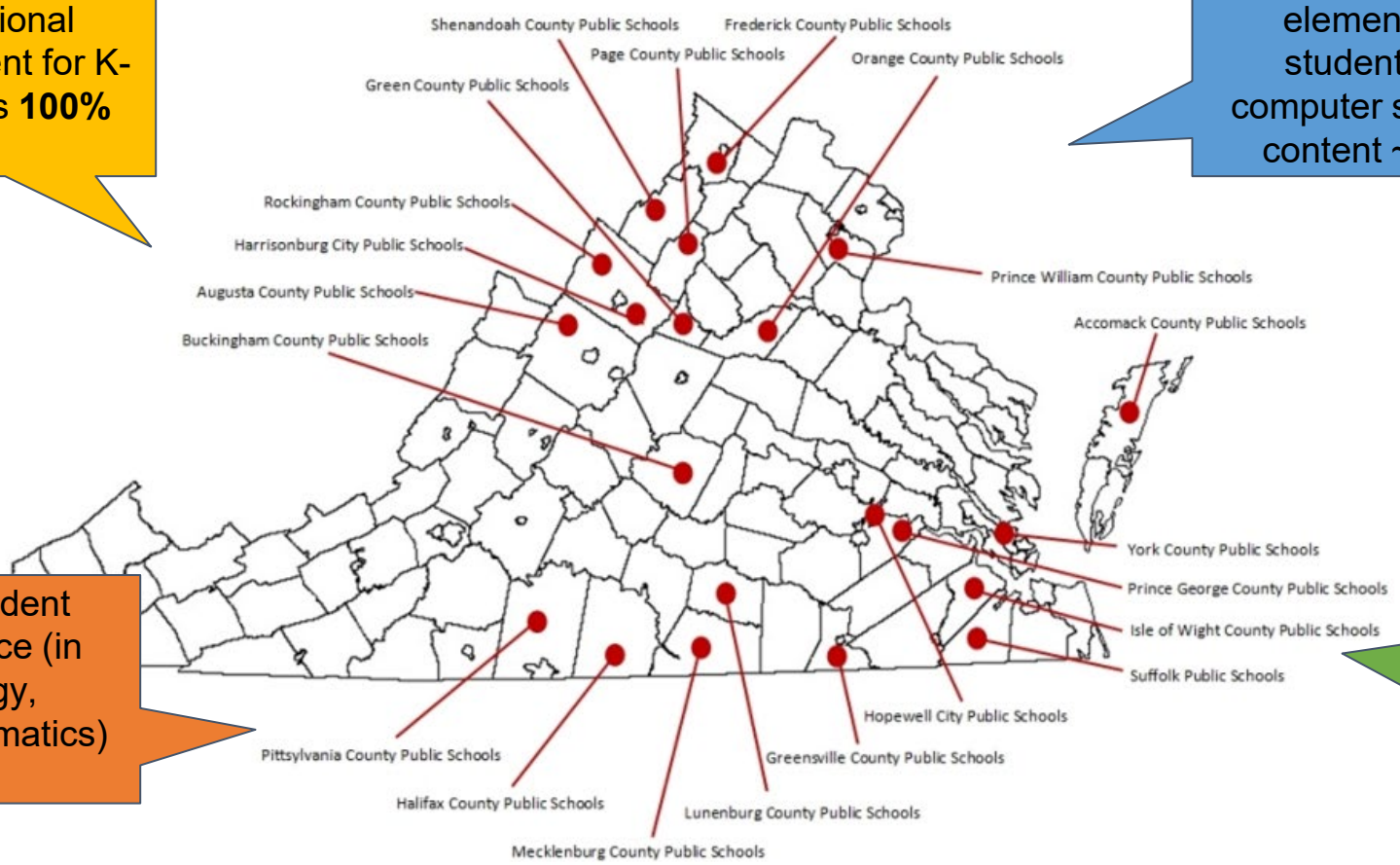
Advancing STEM and CS Integration through Partnerships and Professional Development(2)

1. How does the Commonwealth of Virginia view the integration of computer science into elementary classrooms? (KT)
2. What are some key ideas teachers and students should know about computer science and computational thinking? (DR)
3. What are some ideas for teachers and schools to consider when thinking about joining a project like ARCS? (VF)
4. How do Code VA's programs support the asks of VDOE? How do you structure the online K-5 Coaches Academy PD to make it engaging and build community among geographically separated participants? (NR)
5. How do the microcredentials build on the first year of facilitated PD? (SC)
6. How are classroom resources selected and received by teachers? How are they used? (JB)
7. How many enrollees and completers does ARCS have, and how has this influenced recruitment and evaluation? (SC/JM)
8. What are some key findings of the ARCS research to date? (SC/JM)

School District Reason(s) for encouraging participation in ARCS

Professional Development for K-5 teachers **100%**

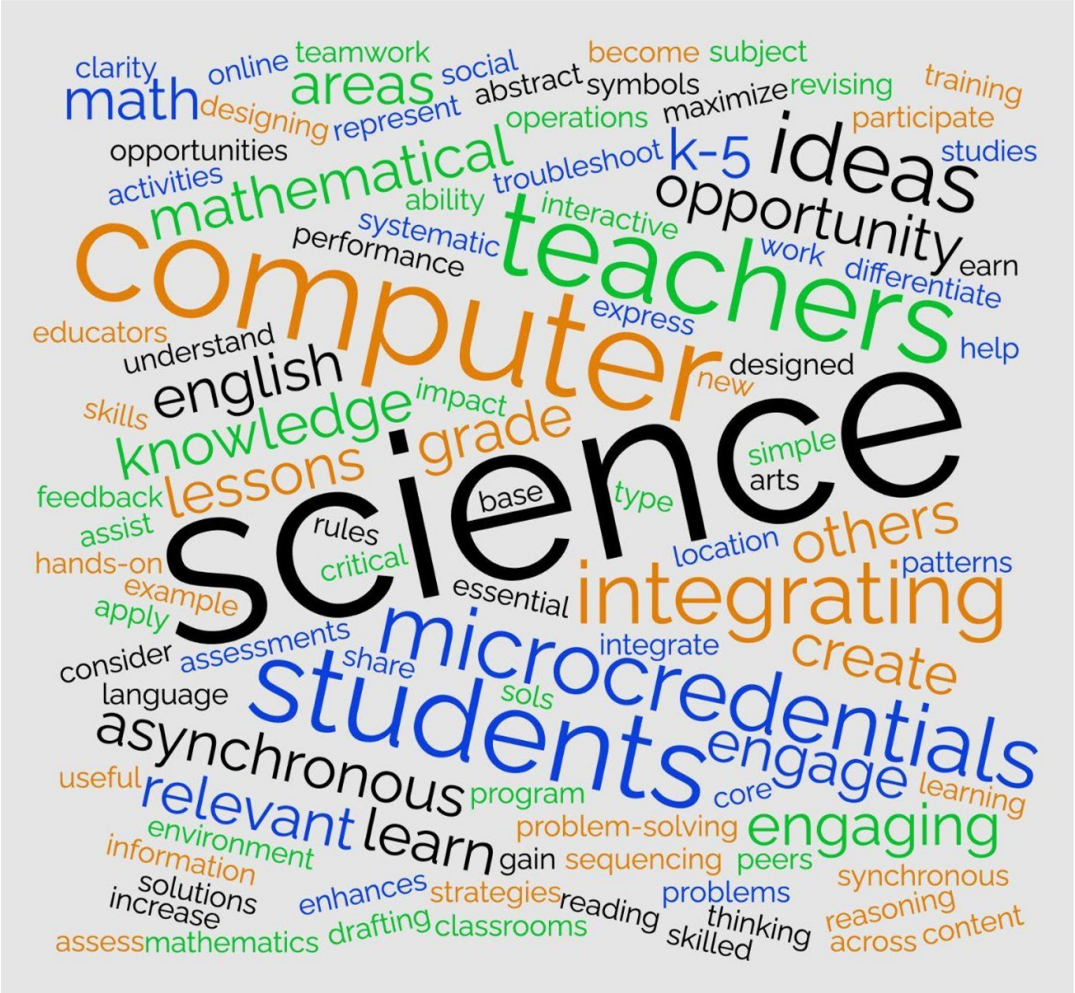
Need to expose elementary students to computer science content **~84%**



Need to improve student academic performance (in science, technology, engineering, or mathematics) **50%**

State Mandate **57%**

Why do teachers participate in ARCS?



Virginia is among 11 states and DC who currently have policies or legislation supporting the use of microcredentials for teacher PD.

The microcredentials include a stack of 5 mini-courses with associated digital badges.

A certificate of achievement with hours for re-licensure points is given upon completion

OLD DOMINION UNIVERSITY

School of Continuing Education

Certificate of Achievement

Jane Doe

This Certificate of Achievement and 40 participation hours are awarded for successfully completing the requirements of

Advancing Rural Computer Science Microcredentials

8/27/2021

Enrollees and Completers

Pilot Cohort

	Applied **n**	**Started ARCS** **n (%)**	**Completed Year 1** **n (%)**	Completed Microcredentials
Schools	38	34	28 (82.4%)	9
Teachers	78	70	67 (95.7%)	12

RCT Cohort 1

	Randomized		**Completed Year 1**		**Non-RCT**		**Completed Microcredentials**
	Treatment	**Control**	**Treatment**	**Control**	**Applied**	**Completed Year 1**	
Schools	11	12	10	10	11	7	4
Teachers	33	44	29	39	14	9	2

They like it, they really like it!

- 57% of eligible elementary teachers enrolled
- 80% from rural schools
- 28% of enrolled participants have completed stack to date

Key Research Findings

- Teachers reported positive perceptions of the PD.
- Teacher CS content knowledge, pedagogical knowledge, self-efficacy, and confidence improved significantly following the ARCS CodeVA Coaches Academy; changes were generally retained at the end of the school year.
- Preliminary analysis indicated a statistically significant improvement in CS content knowledge and affect for students in treatment teacher classrooms compared to students in control teacher classrooms after controlling for pre-CS content knowledge and pre-CS affect.

ARCS provides CS integration resources

“The program has been exceedingly generous. . .I’ve never had anything like that. Any training has always been ‘Here’s your training, here’s your PD, go find the resources on your own.’”

“We’ve already gotten out the Spheros that I got from you guys, which are absolutely amazing to have. . .You put something in their hands that’s not readily available to them and they find that spark, that passion.”

www.odu.edu/tcep/arcs

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