Integrating *Indian Education for All* and *Computer Science for All* in Wyoming Elementary Schools

Fort Washakie School
FREMONT COUNTY SCHOOL DISTRICT #21
"...Today education is the weapon my people will need to protect them."
– Chief Washakie

Fremont County School District #38

WYOMING INDIAN Schools

Wyoming WDE

AIR®
AMERICAN INSTITUTES FOR RESEARCH®

BootUp Professional Development™

PARTNER TO IMPROVE

This project is funded under NSF Award #1923375

What do we hope to accomplish in this project?

Write, pilot, and refine two curriculum units that integrate computer science education standards with *Indian Education for All* standards.

Increase teachers' self-efficacy for teaching CS standards.

Increase teachers' pedagogical and content knowledge related to both integrating the CS curriculum with other subjects and teaching CS standards.

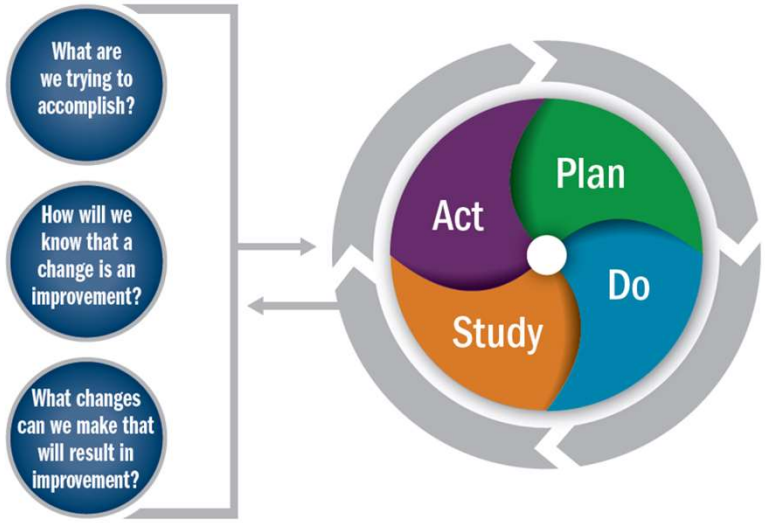
Produce student mastery of Grade 3-5 CS standards, as evidenced by high-quality work samples.

This project is funded under NSF Award #1923375

This project is a collaborative research partnership called a "networked improvement community".

"Rather than asking whether an 'intervention works,' a network improvement community asks, 'What works, when, for whom and under what sets of circumstances?'"

—Bryk, Gomez, Grunow, & LeMahieu, 2015



Source: "Continuous Improvement through Networked Improvement Communities", REL Midwest / Institute for Education Sciences / US Department of Education
https://ies.ed.gov/ncee/edlabs/regions/midwest/ppt/eventslides/REL-Midwest-Iowa-NIC-Coaching-Module1-Slides-508.pptx

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Who are the primary partners in this project?

AIR®
AMERICAN INSTITUTES FOR RESEARCH®

Leads research and facilitating the networked improvement community

Fremont County School District #38

WYOMING INDIAN Schools

Recruits stakeholders for strengths-based assessment and educators to pilot lessons.

Wyoming WDE

Coordinates with districts, schools, and teachers

BootUp Professional Development™

Develops curriculum and educator PD.

PARTNERTOIMPROVE

Conducts the external evaluation of the project

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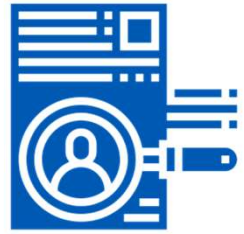
What has the project done already?

Dec 2019 – April 2020	• Get to know the community. • Learn about existing ways community members preserve their cultural heritage via focus groups.
May – Oct 2020	• Continued to learn from the community and effects from COVID-19 • Developed draft of the first curricular unit. • Hosted 2 virtual teacher PDs with Fort Washakie teachers.
Nov 2020 – Feb 2021	• Get teacher feedback from draft of first unit • Host (virtual) teacher PD with Fort Washakie teachers • Update timeline of activities given COVID shifts



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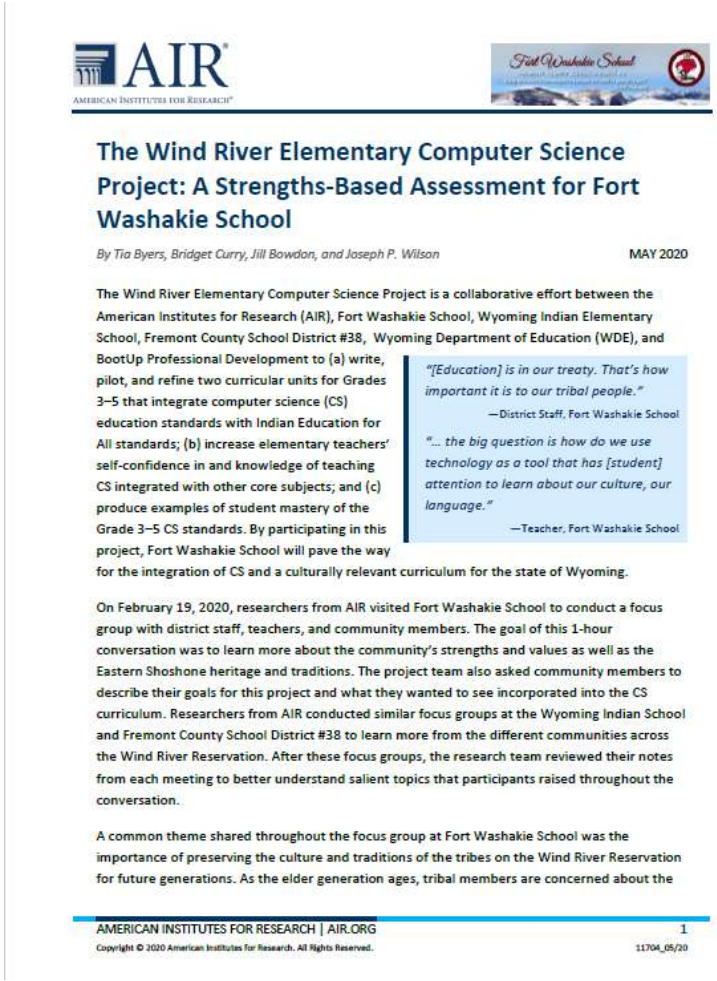
What have we learned so far from focus groups?



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Fort Washakie School

The Wind River Elementary Computer Science Project: A Strengths-Based Assessment for Fort Washakie School

By Tia Byers, Bridget Curry, Jill Bowdon, and Joseph P. Wilson MAY 2020

The Wind River Elementary Computer Science Project is a collaborative effort between the American Institutes for Research (AIR), Fort Washakie School, Wyoming Indian Elementary School, Fremont County School District #38, Wyoming Department of Education (WDE), and BootUp Professional Development to (a) write, pilot, and refine two curricular units for Grades 3–5 that integrate computer science (CS) education standards with Indian Education for All standards; (b) increase elementary teachers' self-confidence in and knowledge of teaching CS integrated with other core subjects; and (c) produce examples of student mastery of the Grade 3–5 CS standards. By participating in this project, Fort Washakie School will pave the way for the integration of CS and a culturally relevant curriculum for the state of Wyoming.

> *"[Education] is in our treaty. That's how important it is to our tribal people."*
> —District Staff, Fort Washakie School
>
> *"... the big question is how do we use technology as a tool that has [student] attention to learn about our culture, our language."*
> —Teacher, Fort Washakie School

On February 19, 2020, researchers from AIR visited Fort Washakie School to conduct a focus group with district staff, teachers, and community members. The goal of this 1-hour conversation was to learn more about the community's strengths and values as well as the Eastern Shoshone heritage and traditions. The project team also asked community members to describe their goals for this project and what they wanted to see incorporated into the CS curriculum. Researchers from AIR conducted similar focus groups at the Wyoming Indian School and Fremont County School District #38 to learn more from the different communities across the Wind River Reservation. After these focus groups, the research team reviewed their notes from each meeting to better understand salient topics that participants raised throughout the conversation.

A common theme shared throughout the focus group at Fort Washakie School was the importance of preserving the culture and traditions of the tribes on the Wind River Reservation for future generations. As the elder generation ages, tribal members are concerned about the

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How are the curricular units being developed?

Wyoming Computer Science Standards Alignment Learn more about Wyoming's computer science standards								
Grades 3-5								
Standard	**Interactive Collage**	**Animated Name/Word**	**Historical Timeline Remix**	**Introducing a Historical Figure**	**Interactive Digital Artifact**	**Virtual Museum**	**Animated Card**	**Historical Story**
5.AP.A.01 Using grade appropriate content and complexity, compare and refine multiple algorithms for the same task and determine which is the most appropriate. *Aligns with CSTA's standard 1B-AP-08.*		✓					✓	
5.AP.V.01 Using grade appropriate content and complexity, create programs that use variables to store and modify data. *Aligns with CSTA's standard 1B-AP-09.*	✓	✓	✓	✓	✓	✓	✓	✓
5.AP.C.01 Using grade appropriate content and complexity, create programs that include sequences, events, loops, and conditionals, both individually and collaboratively. *Aligns with CSTA's standard 1B-AP-10.*	✓	✓	✓	✓	✓	✓	✓	✓
5.AP.M.01 Using grade appropriate content and complexity, decompose (break down) problems into smaller, manageable subproblems to facilitate the program. *Aligns with CSTA's standard 1B-AP-11.*	✓	✓	✓	✓	✓	✓	✓	✓
5.AP.M.02 Using grade appropriate content and complexity, modify, remix, or incorporate portions of an existing program into one's own work, to develop something new or add more advanced features. *Aligns with CSTA's standard 1B-AP-12.*	✓	✓	✓	✓	✓	✓	✓	✓
5.AP.PD.01 Use an iterative process to plan the development of a program by including others' perspectives and considering user preferences. *Aligns with CSTA's standard 1B-AP-13.*							✓	✓
5.AP.PD.02 Using grade appropriate content and complexity, observe intellectual property rights and give appropriate credit when creating or remixing programs. *Aligns with CSTA's standard 1B-AP-14.*	✓	✓	✓	✓	✓	✓	✓	✓
5.AP.PD.03 Using grade appropriate content and complexity, test and debug (i.e., identify and fix errors) a program or algorithm to ensure it runs as intended. *Aligns with CSTA's standard 1B-AP-15.*	✓	✓	✓	✓	✓	✓	✓	✓
5.AP.PD.04 Using grade appropriate content and complexity, describe choices made during program development using code comments, presentations, and demonstrations. *Aligns with CSTA's standard 1B-AP-17.*	✓	✓	✓	✓	✓	✓	✓	✓
5.AP.PD.05 Using grade appropriate content and complexity, with teacher guidance, perform varying roles when collaborating with peers during the design, implementation, and review stages of program development. *Aligns with CSTA's standard 1B-AP-16.*	✓	✓	✓	✓	✓	✓	✓	

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What is coming up with this project?

Dec 2019 – April 2020	• Get to know the community. • Learn about existing ways community members preserve their cultural heritage via focus groups.
May – Oct 2020	• Continued to learn from the community and effects from COVID-19 • Developed draft of the first curricular unit. • Hosted 2 virtual teacher PDs with Fort Washakie teachers.
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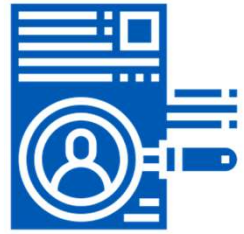

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What questions do you have?

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