



Volunteer-powered computer science program contributes to rural revitalization

In Virginia's Mecklenburg County, Bluestone High School teaches just over 500 students. This rural region's economy relies heavily on manufacturing and agriculture, and the school district has been working to align education with employer needs so people who want to stay in its small towns have the skills needed to compete for good paying and local jobs.

In 2017, Mecklenburg County Public Schools partnered with Microsoft TEALS (Technology Education And Literacy in Schools), a program that works to close the computer science (CS) gap in high schools across the U.S. and British Columbia, Canada. Since its founding in 2009, TEALS has reached 53,000 students.

The Challenge

Nearly two-thirds of principals¹ of schools in rural America say they don't have access to teachers qualified to teach CS, yet 86% of their students say they'll eventually have a job that requires the skills this subject hones. "Teachers qualified to teach computer science just aren't available," says Paul Nichols, superintendent of Mecklenburg County Public Schools in rural Virginia.

At the same time, less populated regions in the U.S. are looking to attract companies that offer good jobs and ensure existing businesses can continue to innovate and thrive. "We have low taxes and a small-town lifestyle, but companies say we don't have

enough workers qualified to fill their jobs," Nichols adds. The result is a constrained local economy with few opportunities that keep young people rooted, contributing to a drain on rural communities.

The Fix

Mecklenburg County Public Schools, under the leadership of Nichols, has recently emphasized building soft skills, technical education and hands-on experience so students are prepared for jobs and higher education once they graduate.

Microsoft TEALS fit that pivot perfectly, Nichols says. After all, one in five TEALS classes serves students in rural communities, and it provides new-to-CS teachers the training, practice and curricula they need to start a sustainable CS program from scratch. The program matches 1,450 CS volunteers, some of whom help from afar via videoconferencing, from nearly 700 diverse companies to team-teach in classrooms. They also provide students with examples of how the problem-

"Computer science education means we'll have a work-ready community to attract jobs to our economy. It's a ray of hope."

-Paul Nichols,
Mecklenburg County Public Schools superintendent

solving, project-based skills of CS can transfer into real-world careers as varied as fiber optics installers to software engineers.

TEALS matched both local and remote volunteers to assist Amanda Bowen, a business teacher at Bluestone High School who had zero CS experience. TEALS classroom teachers gradually master CS so they can teach the class without volunteer support; Bowen is poised to do just that next year.

In a county of roughly 32,000 people, this public-private partnership brings together the expertise of schools and teachers, industry professionals, local businesses and Microsoft TEALS to prepare its young people to thrive in any industry. "Without this partnership, we just wouldn't have reached the high bar we have now," Nichols says.



25%: The share of TEALS schools based in rural communities, by the 2020-2021 school year.

Promising Practices for Deeper Impact

1. Embrace remote learning. "To find enough people who have the technical background to mentor and co-teach computer science, you may have to move beyond your rural area," Nichols says. Students—who are used to communicating via technology—are quick to embrace remote learning. They email or video chat remote volunteers for debugging projects or career advice. "I hear students say, 'I don't just have one teacher, I have four other teachers who work in computer science and they're helping guide me,'" Bowen says.

2. Pool resources with nearby schools. Small districts may not have the funding or staff to create a CS program in every school, which is why the Mecklenburg school district provides transportation to

interested students from the county's other high school to Bluestone's TEALS course. "That way we make sure every student with an interest gets the opportunities computer science provides," Bowen says.

3. Create a pipeline. Introducing CS in elementary and middle schools gives students confidence CS is for them, helps them build foundational skills to apply in later classes, and gets them excited about future careers. The Mecklenburg school district is introducing a programming curriculum to younger grades, and TEALS students teach Hour of Code activities to children as young as 7.

4. Partner with businesses. Local companies are a terrific source of mentors and volunteers who can share careers students might not be familiar with—and what it takes to enter those fields, Nichols says. "I tell companies, 'If you really want the best workers, you have to engage with them as early as middle and high school,'" he adds. The connection benefits companies by ensuring students graduate with the skills to start entry-level jobs or a plan to gain higher level skills; students learn they love a subject they'd never considered; and teachers get an insider's view to a constantly evolving industry—insights they can pass along to even more young people.

5. Attract students who don't self-select into CS. Myths and misconceptions (for example, that CS is only for boys, "techie types" or the well-off) can lead students to avoid trying out a subject powered by creativity and fun. But leveraging one quality of small towns—that "everybody knows everybody"—helps teachers attract students who don't sign up on their own, Bowen says. For example, 19-year-old Alissa Hardison resisted her guidance counselor's suggestion to take the TEALS course last year but finally relented—and was shocked to discover she loved coding. Before TEALS she didn't envision herself going to college; now she is earning her associate's degree in web development. She says, "This class was the greatest thing that has ever happened to me."

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