



Tech industry volunteers help bring computer science to students in rural Virginia

"Regardless of their economic background, every kid deserves to be exposed to every opportunity they can, equally. TEALS leveled the playing field. And to anyone who thinks they can't offer CS in their school or financially support it, look at our little school and know you can."

-Ty Gafford, Principal, Altavista Combined School

Computer science translates into job readiness

Altavista, a tightly knit community in rural Virginia, is still recovering from the recession and the loss of 4,000 manufacturing jobs when a local furniture plant closed. The future for students at the Altavista Combined School was looking bleak: graduates faced both a tighter job market and a rapidly changing employment environment. Education leaders, the Altavista Chamber of Commerce, and the community at large recognized that students graduating from high school weren't equipped to compete for well-paying hometown jobs that now required a technical component.

Local companies acutely felt the disconnect between the skills graduates have and what their businesses need. Even manufacturing jobs require technical know-how, says Heather Reynolds, president of the Chamber of Commerce. "It used to be if a conveyor belt broke, you just fix the belt," she adds. "Now, you need to reprogram everything. You need to have computer knowledge and technical skills to even do the simplest of tasks."

The community came together when they realized that computer science (CS), which teaches students coding, critical thinking, creativity, and innovation, could help meet business needs and prepare students for a more successful future, whatever their ambitions. CS is now

empowering this rural community to expand economic opportunity to its young people—and give them the option to help make Altavista a better place. "I want to make sure that our kids are prepared to enter the workplace," Reynolds says. "I want them to know that there is a future here for them and they don't have to leave the community they love in order to prosper."

How Altavista brought computer science education to their community

Altavista is small enough that it's hard to go long without bumping into folks you know. "Everyone knows everyone here," Reynolds says. So it's no surprise that it was through informal conversations that leaders in the community explored approaches to CS education.

Carroll Moon, a Microsoft employee who works remotely from Altavista, didn't want the high school kids he coaches to face the same economic dead ends he did growing up in this small town. As a board member of the Altavista Chamber of Commerce, he recalled reading about a colleague who volunteered with TEALS (Technology Education and Literacy in Schools), a Microsoft Philanthropies-supported program that aims to bring CS to every high school in the United States (US).

After researching TEALS, Moon, Reynolds and Gafford

realized that the TEALS CS education model fit their community in several ways:

1. Rural access. TEALS is designed to empower rural communities just as much as urban and suburban ones. As it turned out, Altavista did find volunteers from the technical field locally to train an Altavista high school teacher and assist in the classroom, but other schools in the US work with volunteers who help remotely and “attend” class via videoconferencing.

2. Sustainable. TEALS uses a “train the trainer” model to create a sustainable CS program, and this appealed to Gafford. “I wanted to support my teacher; otherwise, any computer science program would fail,” the principal says. “TEALS was very systematic in how to implement it. TEALS helped train our teacher, provided a mentor for him and gave expectations of what we should be doing every year.”

3. Relevant to careers. TEALS uses CS professionals in the classroom. This helps give young people a real-world perspective of what they can do with the skills they learn in class. What’s more, volunteers are role models and demonstrate that the computer science field is full of interesting and diverse career opportunities across industries. That can be key in expanding teens’ ideas for what’s possible in their future, especially in a rural community like Altavista.

4. Taught on-site. TEALS is taught on the Altavista campus, as opposed to other technical electives run at a technical center a bus ride away, and its location helped reach more potential students: Any high schooler can consider learning computer science, regardless of their extracurriculars or access to transportation.



What is a “train the trainer” model?

Communities across the US face shortages in teachers qualified to teach CS. TEALS addresses this shortfall by pairing technology professionals from more than 400 companies with teachers who want to teach CS. Together, they build a sustainable CS program where teachers are ready to teach either Introduction to CS or even AP CS independently in two to three years.

“Giving students some exposure to computer science through TEALS is going to greatly increase their chances of doing something better with their lives.”

—Jeff Danielson, TEALS volunteer, Altavista Combined School

Steps Altavista used to implement TEALS

Once the community decided to partner with TEALS, they applied and prepared for the program. TEALS generally asks schools to apply in the fall, leaving ample time to get through the application process and develop a supportive partnership. For Altavista, though, the process took only a few short months; they applied mid-spring, and the class began on-schedule in the fall. “It all happened very quickly while we were also getting ready for the school year,” Gafford says. “But it was an opportunity we didn’t want to miss, so we wasted no time.”

1. Apply. In the application, school leaders explained why the school needed CS, what the opportunity would mean for young people in their community, and how the commitment to CS would continue for the years to come. A representative from TEALS interviewed Gafford, who explained that without TEALS, young people in Altavista may never encounter CS education. Among the things that stood out in Altavista’s application: The principal’s dedication and deep support from the community.

2. Gain support. The Altavista community found CS wasn’t a hard sell. Parents were quickly on board, hoping the class could offer their students more economic and educational opportunities. Students were excited to get hands-on experiences creating, and not just using, technology. And business leaders not only supported the idea; they covered the stipend which is sometimes offered to professional volunteers. “Everyone we talked to was so excited,” Reynolds says. “Local businesses, local foundations, everyone was all in, because this is so important.”

3. Evaluate equipment. Matt McLean, the teacher who would take on the new CS course, evaluated the school's existing technology infrastructure. He compared the hardware, software and connectivity to a checklist TEALS provided to see what improvements he needed to make, then made minor upgrades and installed the programming languages that are used in the course.

4. Recruit volunteers. Schools, with the help of TEALS, play an essential role in finding committed volunteers to co-teach; Altavista quickly found enthusiastic professionals to share their time and expertise. Connecting with local businesses, colleges or the chamber of commerce can help recruit volunteers, as can local publicity. Retired programmer Jeff Danielson, who has spent two years as a co-teaching assistant in the Altavista TEALS classroom, signed on after reading about the program in the local newspaper. "There are limited opportunities in this area," Danielson says. "Giving students some exposure to technical education is going to greatly increase their chances of doing something better."

5. Enroll students. Gafford educated the school's guidance counselors about CS and shared the prerequisites for the elective. In turn, the counselors identified students who might be interested and asked if they wanted to join the school's first CS class. Counselors had no trouble recruiting about a dozen enthusiastic teens.

6. Embrace self-teaching. TEALS is designed to train classroom teachers with no coding experience, so it wasn't a problem that McLean wasn't already a programmer. Over the summer, McLean participated in professional development to learn the basics. He also played with Snap!, the programming language used in the Introduction to Computer Science class, so he understood how it worked before students arrived in the fall.

"TEALS is an opportunity to expose kids to what the skills they're learning look like in real life. That was huge in terms of getting kids interested in computer science."

-Ty Gafford, principal, Altavista Combined School

Lessons learned

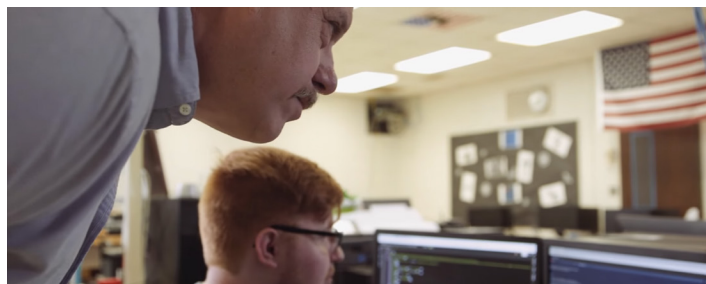
It has been four years since Altavista Combined School began offering TEALS CS classes. Over that stretch of time, the community has ironed out some of the wrinkles in teaching teens the fundamentals of CS.

1. Lean into the teacher's learning. The very model of TEALS, in which the classroom teacher has little to no experience with CS and relies on a volunteer from the tech industry, means that the course's teacher does not have all the answers. This can be intimidating for teachers ("What if students ask me something I can't answer?" they might wonder), but it also provides a terrific, real-life example of the problem-solving ethos CS encourages. "Good educators are modelers of what students should be learning," Gafford says. "Mr. McLean shows them, hey, I had to get help and it's ok, and I'm learning how to do this, too." Demonstrating perseverance, self-teaching skills and breaking down a challenge into more manageable steps inspires students to take the same tack when learning CS.

2. Actively pursue diversity and gender equality. Especially at first, the TEALS CS class skewed toward Caucasian boys. But Gafford, who is African American and was the first in his family to attend college, is working to ensure all students—no matter their gender, ethnicity or socioeconomic status—feel they can give CS a try. "These kids are surprised to learn that I get where they're coming from, with their family situation or being terrified you won't succeed at something," Gafford says. "When I was in high school, there were several people who told me, you can do this. I work to provide that same encouragement to my students."

3. Leverage student ambassadors. Gafford and McLean found that while a counselor's recommendation to sign up for TEALS didn't hurt, students' praise was the driving force behind enrollment. In addition to organic word of mouth, Gafford has also arranged for students who embraced TEALS to talk to their peers in information sessions. Students who have taken TEALS share not only why it helped them, but also the things younger students can do now (take geometry, join the robotics club) to prepare to take CS in the future.

4. Start sooner than later. Altavista didn't apply to TEALS until the spring; although they were accepted and offered their first CS class the following fall, submitting an application earlier would have left more breathing room for administrators, volunteers and the classroom teacher.



Reflections: We've changed students' future

CS education plays a vital role in a well-rounded school experience that equips Altavista students—and the town—for a better future. As Gafford says, "It's my mission every day to let students know there's more out there in the world they could be good at." CS is a part of that mission and is now a pillar of the high school's elective offerings.

Altavista has goals to offer the opportunities CS education affords to even more young people. In addition to encouraging more minorities and girls to sign up, Gafford hopes to one day offer CS classes to the middle school where he is also principal. And he wants to further integrate CS education with the after-school robotics club.

Looking farther into the future, leaders in Altavista hope the skills, confidence and problem-solving approaches Altavista TEALS students learn will equip them for a better future—a future in which they can explore the world or stay and thrive in Altavista. In short, they see CS education as a way to provide young people with more choices.

"Investing in these students, investing in the computer science program, the robotics program, is opening the window of opportunity," Reynolds says. She adds that computer science education is making her town stronger and more ready for the future—whatever it may bring.

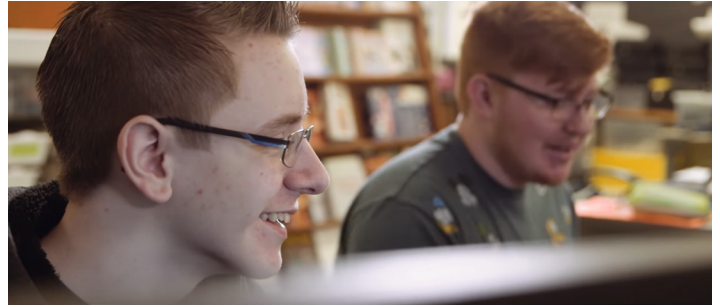
To other educational professionals, Principal Gafford has this to say: "To anyone who thinks they can't offer CS in their school or financially support it, look at our little school and know you can." He adds, "The kids in our TEALS classes are engaged and encouraged in knowing they may go on to college and do this the rest of their lives. With this program, we make a difference in the life of kids who might otherwise not have this chance."

TEALS expands students' idea of what's possible

Isaac Smith, whom his friends call Spiky, is learning CS in his school's TEALS class with the help of his teacher and a real-world experienced programmer volunteer.

The freshman had never tried CS before enrolling in the

TEALS class, and he may not have gotten the chance to explore CS otherwise.



Now that he has come to love programming, Isaac hopes to one day start a gaming company. The possibility of earning a good salary in a rewarding job is especially appealing because he wants to support his dad, who takes expensive medication for arthritis.

"I like programming because it allows me to create something out of nothing," Isaac says. "I can make whole worlds, and eventually, with enough code, really anything I could imagine."

Community profile

Town name: **Altavista, Virginia**

Population: **3,450**

School: **Altavista Combined School**, 680 students in middle and high school grades

Years partnering with TEALS: **4**

TEALS 2017-18 Profile

Partner Schools: **348**

Industry Professionals Volunteering: **1050**

States served: **29 and District of Columbia**

Program Inception: **2009**

For more information on TEALS or to apply to be a TEALS school: tealsk12.org

Want to bring computer science to your school or nonprofit but unsure how to start? We can help. microsoft.com/digitalskills