About Broward County Public Schools

- http://www.browardschools.com

- The nation's sixth-largest public school district, with 260,000 students
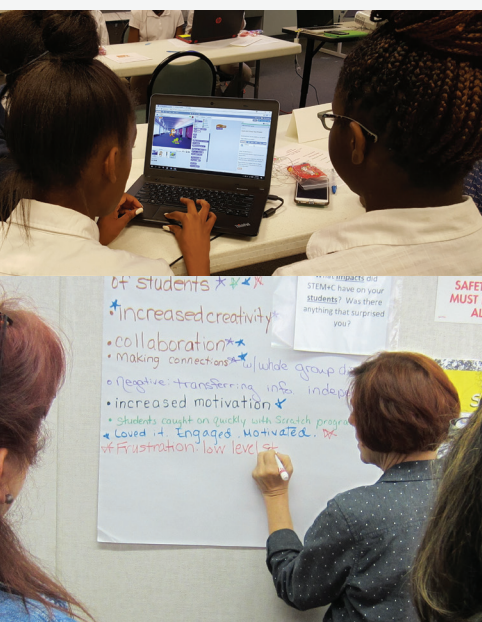
What they wanted to do

- Improve underrepresented students' access to CS education by creating more CS teachers

- Provide professional development and ongoing support for teachers learning CS

- Increase CS classes district-wide and encourage more students to take AP CS

What they did

- Expanded professional development and mentoring opportunities for teachers

- Created an online CS course to help teachers get CS state certification

What they accomplished

- 50 teachers will study for CS certification during the 2017-18 school year

Broward County Public Schools attract diverse students to CS classes

About Dr. Lisa Milenkovic

Dr. Lisa Milenkovic is the STEM and Computer Science Supervisor for Broward County Public Schools (BCPS), the sixth-largest school district in the nation and the second largest in Florida. Milenkovic started her career in analytic chemistry, shifting to teaching when her children became school-age. Her interest in chemistry led her to discover ways to improve computer science (CS) education in her district, as the two disciplines are closely related. She is an experienced science curriculum supervisor, developing curriculum and administering professional development for content and pedagogy in STEM. She is an advocate for CS education at all grade levels, and in 2013, began work with Code.org and Google to improve CS professional development for teachers.

Challenge

Milenkovic knew that CS and computational thinking (CT) played a key role in her success as a chemistry teacher. During the early 2000s, Milenkovic began teaching science in the district. By 2013, the district decided to expand its STEM education offerings to include CS. Milenkovic intuitively knew the importance of teaching CS in conjunction with STEM classes.

Awareness of CS was minimal across the district. "A lot of students and teachers had never even heard of computer science, or they confused it with computer literacy," says Milenkovic. Even within the district's STEM programs, computer science was under the radar. Some STEM teachers taught computational thinking, but only as it related to math.

The low awareness of CS meant few students took the AP Computer Science exam. As late as 2016, only 200 students took the exam, out of a district of 271,000 students. To Milenkovic, the low turnout was startling. Not only were few students taking the AP CS exam, but even fewer were from groups underrepresented in CS. It was clear the equity gap in BCPS was large and unindicative of the diversity of the students in the district. Milenkovic believed that needed to change. "All students should have the opportunity to study computer science, so they have an equal chance to succeed," she said.

Solution

As Milenkovic moved from full-time teacher to a STEM education supervisory role in 2011, she realized the key to improving CS education for students was by training teachers in the district. Teachers needed ongoing professional development (PD) and mentoring so they could inspire students to pursue computer science.

As a first step, the district partnered with Code.org, a nonprofit that encourages the expansion of CS teaching in K-12 schools. Code.org provided funding for professional development and helped to create a pool of "master teachers" with experience in developing CS curriculum.

Inspired by the Code.org partnership, Milenkovic started looking for more ways to support teachers through their career journey. She applied and was awarded Google funding for the 2017-2018 cycle, after learning about Google's grant program through the Computer Science Teachers Association. Google's grant allowed BCPS to create an online PD course to help educators achieve state certification in Florida for teaching CS.

Since Milenkovic knew that teachers needed ongoing support — like mentoring and paid time off to study — she designed the grant to reimburse teachers for their time spent taking the online course. Some funding goes toward in-person mentoring by master teachers. "When you're starting a new initiative like building a computer science program, you don't have formal departments, or methods for teachers to interact with one another," she says. "You need to help teachers build up their peer network."

> "Today, the diversity of students studying CS better mirrors the diversity of our district."
>
> — Lisa Milenkovic, STEM and Computer Science Supervisor, Broward County Public Schools

Benefits

Investing in a teacher's career journey in CS

The CS certification course and face-to-face mentoring funded by Google's grant builds CS teaching expertise in the district, increasing the availability of CS classes district-wide. The online course will be available to teachers of any discipline who want to learn more about CS, not just those seeking certification. As demand for CS and coding in the K-12 environment grows, this class will become a valuable tool for expanding CS knowledge among many types of teachers.

Teachers who are taking time out of their busy day to attend the CS certification course need extra support — especially mentorship. By compensating teachers for time spent studying and meeting with mentors, Milenkovic sees an opportunity to send a message to would-be CS teachers: "that we value their time and professionalism," she says. This show of support for professional development will encourage more teachers to seek out CS training in the future.

Broadening access to CS education across the district

Because of the investment in ongoing teacher PD for computer science, the district is steadily increasing the availability of CS classes across the 286 schools in the district. Today, most BCPS high schools offer "Exploring Computer Science", an introductory course created by the National Science Foundation to prepare students for the AP CS exam. Some middle schools even offer a "Computer Science Discoveries" class based on a lesson plans from Code.org. Even the district's 141 elementary schools have started integrating CS education within the standard curriculum, offering a CS class that rotates among grades, and after-school coding and robotics clubs.

Increasing diversity in CS

Creating broad access for CS PD was key to reaching underserved communities. As the country's sixth-largest school district, BCPS has many schools with students from low-income families, including some schools with 100 percent of students on the free/reduced lunch program. By making CS a priority in the district, Milenkovic believes that students are gaining confidence in their abilities in CS. "We're giving this opportunity to students who might not have thought about participating in the past."

More diverse groups of students are showing enthusiasm for CS thanks to the increased opportunities to study CS in the district. In 2017, 1,000 BCPS students took the AP computer science exam – a significant increase from the 200 students in 2016. Milenkovic says: "Today, the diversity of students studying CS better mirrors the diversity of our district."

About Google's CS PD Educator Grants

We updated the text for this section: Google's Educator PD grants provide funding and resources to equip and empower computer science (CS) teachers through professional development (PD) programs. Administered by a PD CS expert, each program has three key components of successful and sustainable CS PD:

1 The development and delivery of content that increases educators' knowledge of CS and computational thinking;

2 Educators and PD providers co-create content to meet local student and educator needs;

3 A platform to support teacher learning throughout the school year through a community of practice, professional learning network or other educator support resource groups.

For more information on CS Professional Development, visit *g.co/CSedugrants* and join our G+ Community.