AP Computer Science Principles Attract Diverse Students With Real-World Problems

Q ww2.kqed.org/mindshift/2017/07/31/ap-computer-science-principles-attracts-diverse-students-with-real-world-problems/

By Anya Kamenetz

U.S. high schools got a high-tech update this past school year. Not by federal fiat or by state law, but largely at the hand of independent nonprofits, including one founded by twin brothers less than five years ago.

The College Board last fall introduced a new course and exam called AP Computer Science Principles. Eight years in the planning, it was the largest such course launch in history. While the existing AP Computer Science course focuses on the Java programming language, the new course is billed as a creative exploration of real-world problems. It's designed to appeal to people who might have assumed that computers were not for them.

And in that sense, it's working.

According to figures just released, from 2016 to 2017 the number of underrepresented minorities who took an AP Computer Science exam nearly tripled, from 8,283 to 22,199. The number of girls shot up from 12,642 to 29,708.

While significant, this increase was not enough for those two groups to reach parity. Only 1 in 5 of those taking AP CS last year were underrepresented minorities and about 1 in 4 were women.

The course opened doors on a school level as well. Maureen Reyes, the executive director of the AP program at the College Board, says that 100 new schools last year offered the new class as their first AP course ever.

How CS Principles was born

"The entire reason the new exam and course were created was to broaden participation in computer science," says Hadi Partovi, a tech entrepreneur and investor. That's also the mission of Code.org, the nonprofit Partovi started with his brother Ali. The organization first made a name for itself with Hour of Code, a voluntary effort to introduce a single coding lesson that the organization says has now reached 100 million K-12 students around the world.

Code.org, along with its Silicon Valley backers, is taking a leadership role in the rollout of AP CSP. It is one of eight authorized course providers; more than half of all schools teaching the course are using their curriculum. They've created a slick online production featuring interactive exercises and special guest stars. For example, Vint Cerf, one of the "Fathers of the Internet," recorded a video explaining how it works.

The College Board, Code.org and other authorized providers are also training teachers to facilitate the course. Hundreds of them, not necessarily from STEM disciplines. "We are by far the largest player in creating new computer science teachers," Partovi claims.

Code.org trained 500 teachers last year, and plans to train another 900 this year, with a blend of in-person intensive workshops and online support. The group concentrates its programs in low-income areas. In all, says Reyes, the College Board prepared about 1,300 teachers last year, and its partners another 1,300, all to teach this one course.

Whenever a particular subject starts to be taught much more widely, there is a worry that it's going to be watered down. That's not the case with AP CSP, says Reyes.

The course, developed with the help of the National Science Foundation, is patterned after introductory computer science classes at top colleges, she notes. In fact, in addition to Code.org, other authorized course materials come from the Beauty and Joy of Computing, a course taught at the University of California, Berkeley; and CS50, a

Harvard course that is among the [most popular](#) for freshmen.

"The new course is much more about making things, rather than answering multiple-choice questions," says Partovi. AP CSP requires students to submit a portfolio of original work. The only other regular AP course that does that is Studio Art.

Students learn about the structure of the Internet, data analysis and representation and making apps. AP CSP doesn't require a particular language. Instead, you can use a visual, drag-and-drop programming "environment" such as Scratch, which was originally designed for elementary school kids.

Just imagine for a minute that there was an initiative to teach some other subject — say, Chinese — at the Advanced Placement level to tens of thousands more students next year, using teachers who don't speak Chinese themselves and copies of Rosetta Stone language software. Partovi says it works with CS because "Our curriculum is designed to be a little more self-teaching. The teachers' job is to facilitate."

Now imagine that that initiative was led by, say, Chinese companies like Alibaba. Or that the fossil fuel industry led a successful push for an AP Petrochemistry course (the way they [fund science curricula](#) in states like Oklahoma.)

Industry support has "been a huge factor in the success of CSP," says Reyes, and that's a good thing. "We're looking at a pretty innovative time where industry is stepping in to help education offer computer science to students."

In the end, the promise of any AP course is that students will find what they learn to be worthwhile in the future — and that they will burnish college applications, of course.

Harvey Mudd College, a small private college in California that focuses on both engineering and liberal arts, is one of hundreds of colleges that have agreed to recognize AP CSP.

Harvey Mudd freshmen who have taken either AP CS course can choose to track into the more advanced version of the required freshman CS course. The college's president, Maria Klawe, is on the advisory board of Code.Org.

"I love the new AP CS Principles course," she says. "It's very similar to the course we put together for every student at Harvey Mudd in the first semester. The whole idea was to let students see that what they're going to learn matters in life."

Explore: [Culture](#), [Kids and Coding](#), [AP classes](#), [coding](#), [computer science](#), [equity](#)

Related

[Demand for Computer Science Classes Grows, Along With Digital Divide](#)

[How to Start and Build an Inclusive Computer Science Program](#)

[Steps Teachers Can Take to Keep Girls and Minorities in Computer Science Education](#)

[How Can Schools Tap Into Parent Power For the Good of Students?](#)

[Interests-to-Internships: When Students Take the Lead in Learning](#)

[Closing the Gender and Minority Gap in Computer Science](#)

[Powered by](#)