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SDSC, Sweetwater Schools Catch Eye of NSF, White House

Computer courses garner invitation to prestigious national science summit

Five years ago, there were no computer science classes offered by schools within San Diego's Sweetwater Union High School District, and Arthur Lopez, a teacher at Sweetwater High School in National City, decided to do something about it.

Through a joint effort between the school district, the San Diego Supercomputer Center (SDSC), and UC San Diego CREATE (Center for Research on Educational Equity, Assessment, and Teaching Excellence), the school today has a number of courses on computer science principles, several of which are Advanced Placement classes that encourage students to continue their education.

"I embarked on this journey to address what I saw as an education access inequity issue for our students," said Lopez. "The San Diego Supercomputer Center and UC San Diego provided the training I needed to accomplish this."

That effort also earned Lopez and Sweetwater High School senior Karla Gonzalez, who plans to major in computer science in college, a last-minute invitation to participate in a national summit on computer science education, sponsored by the College Board and the National Science Foundation (NSF) as part of Computer Science Education Week (CSEdWeek), an annual program dedicated to inspiring K-12 students to take an interest in computer science.



Edward Felten, Deputy U.S. Chief Technology Officer with the White House Office of Science & Technology Policy (left) with Sweetwater High School Student Karla Gonzalez and Teacher Arthur Lopez

Other San Diego teachers selected to attend the summit included Maricruz Rosete, Yesenia Cedillo-Ramirez, and Juan Ramirez (Sweetwater High School); Ray Kinne (San Diego High School); and Ruth Maas (Steele Canyon High School).

Last-Minute Call

The day before boarding their flight to Boston, Lopez learned that he and Gonzales were among this select subset of teachers and students to meet late last week with Edward W. Felten, Deputy U.S. Chief Technology Officer (White House Office of Science & Technology Policy); James F. Kurose, NSF Assistant Director, Computer and Information Science and Engineering; and Janice Cuny, NSF Program Director for Computing Education.

“As a rule, I never have my phone on but I happened to be texting my principal when the call came in from the College Board,” said Lopez. “My students got to listen in on the conversation and found it amazing. What a great opportunity this is to bring attention to computer science education, the impact it has on students’ lives, and how our region is embracing this educational endeavor.”

Lopez and Gonzalez spent nearly two hours with Felton and key NSF officials, which included a tour of “The Science Behind Pixar” exhibit at the Boston Museum of Science. “On the 35-minute walk back to the hotel from the museum, Dr. Felten talked with Karla about computer science and public policy,” said Lopez. “Who knew that one of my students would get a chance to talk with a high-level computer scientist who meets regularly with President Obama? Karla and I were high-fiving each other afterwards.”

Creating a Village

Lopez, who has taught at Sweetwater High School for nearly 30 years, had no computer science background when he began working with Diane Baxter, SDSC’s former director of education, and Beth Simon, with Jacobs School of Engineering at UC San Diego, through an initial program funded by the NSF called ComPASS (Computing Principles for All Students’ Success). By the time Lopez completed his training, he was both a master teacher in the subject and a curriculum writer for the College Board.

“Watching teachers like Art change students’ lives by introducing them to problem-solving and thinking skills within CS Principles makes me an optimist,” said Baxter, who retired in November after 10 years with SDSC. “The passion and dedication of the wonderful teachers with whom

we've worked for the past five years, and the teachers they are recruiting to expand CS Principles for all students, is changing lives every day.”

This past spring, SDSC embarked on a second phase of its teacher training effort known as CS-CaVE ([Computer Science-Creating a Village for Educators](#)). The goal of the three-year, nearly \$1 million NSF grant is to develop model “villages” for introducing and sustaining up-to-date computer science courses in school curriculum. Sweetwater, Vista, and San Diego Unified School Districts are partners in the grant.

“Making sure every middle and high school student takes a basic computer science course will help diversify the technical talent pool needed to find creative solutions to the future challenges we face,” said Karen Flammer, SDSC’s newly appointed director of education. “The key to success are teachers who share their enthusiasm and passion for computationally based science and research.”

CS-CaVE addresses a persistent problem created by the vastly different rates of change between technology innovation and pre-college public educational curriculum. Whereas statewide curriculum standards undergo major revision roughly once a decade, technology introduces new discoveries and changes every few months or couple of years.

In most U.S. schools, computer science is offered as an elective or not available at all, according to [a statement on the White House website](#). Yet, “computational literacy” – the ability to code, script, design, program, debug, and understand computer science – is rapidly emerging as an essential skill for today’s students.

Moreover, many jobs in the 21st century require the type of problem-solving ability that is advanced by training in computer science. The U.S. Bureau of Labor Statistics projects

that by 2020, information technology (IT) skills and computational thinking will be needed in more than half of all jobs and that greater than 50 percent of the science, technology, engineering, and mathematics (STEM) job growth during that period will be in computer science fields, leading to a shortage of more than one million IT-skilled Americans.

MEDIA CONTACT

Jan Zverina, 858-534-5111, jzverina@sdsc.edu

Lynne Friedmann, 858-793-3537, ltfriedmann@ucsd.edu

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