UTeach Computer Science

Background Concerns and Momentum

Labor Concerns

The U.S. Department of Education projects that more than half of all science, computing (technology), engineering, and mathematics (STEM) jobs will focus on computing by 2020, but only 2% of all STEM undergraduates major in computer science. Only 400,000 of these majors will be available to fill the 1.4 million positions expected to become available by 2020. About three-quarters of computing positions are expected to be filled by individuals outside the U.S. or remain unfilled altogether.

Participation of Women in Computer Science

Women hold 57% of all professional jobs in the U.S. but only one-quarter of computing positions. The number of women in computing has dropped consistently over the past 30 years, even as women have entered other STEM occupations at increasing rates.

- In 1984, 37% of all computer science undergraduate degrees were awarded to women.
- A decade later, that figure was 28%.
- In 2011, it was less than 12%.

Participation of Historically Underrepresented Groups in Computer Science

Only 7% of computing positions are held by individuals who identify as Black or African American; only 6% are held by individuals who identify as Hispanic or Latino. In 2014, a handful of Silicon Valley technology companies released data for the first time on the diversity of their employees. Only 5% of all employees at Google, and 6% of those at Facebook and Yahoo, self-identified as Black or Hispanic.

K–12 Computer Science Education

Only about half of all U.S. states offer teaching licenses or endorsements in computer science or count computer science courses toward students' STEM requirements for high school graduation.

These deficiencies have wide-ranging effects in K–12 education. Fewer than one-quarter of all U.S. students have access to *any* computer science courses in high school. In 2013, the College Board noted that "hundreds of thousands" of students are unable to participate in Advanced Placement (AP) courses for which they demonstrate "high potential," as these courses are much less likely to be available in schools with higher numbers of low-income and traditionally underserved minority students. Even then, AP courses in computer science, in particular, are offered in only 15% of the 15,000 U.S. schools with AP programs.

- Of students who took the AP Computer Science exam in 2013, **less than 20%** were female. About **8%** were Hispanic, and only **3%** were African American.
- In 11 states, **zero** African American students took the exam. In one of those states, Mississippi, 37% of the population was African American.
- In 8 states, **zero** Hispanic students took the exam.
- In 3 states, **zero** female students took the exam.
- In 2016, the College Board released data showing that, in eight states, **fewer than 10** young women took the AP Computer Science exam the previous year.

Recent Momentum

Recent efforts to improve K–12 computer science education in the U.S. have focused on the following:

- Expanding public notions of computer science beyond programming;
- Standardizing computer science curricula through initiatives such as *Computer Science Principles*;
- Increasing access to computer science education (e.g., code.org, reform efforts such as the Computer Science Education Act H.R. 2536/S. 1407);
- Encouraging the participation of young women and students from other historically underrepresented groups (e.g., College Board's social justice agenda, Black Girls Code, Code2040, CS First, Hack the Hood, Made with Code); and
- Better preparing and supporting greater numbers of computer science educators (e.g., CS for All).

UTeach Computer Science builds on all these efforts.