



Diversifying the STEM Pipeline Panel

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Moderator: Allison Scott, *Kapor Center for Social Impact*

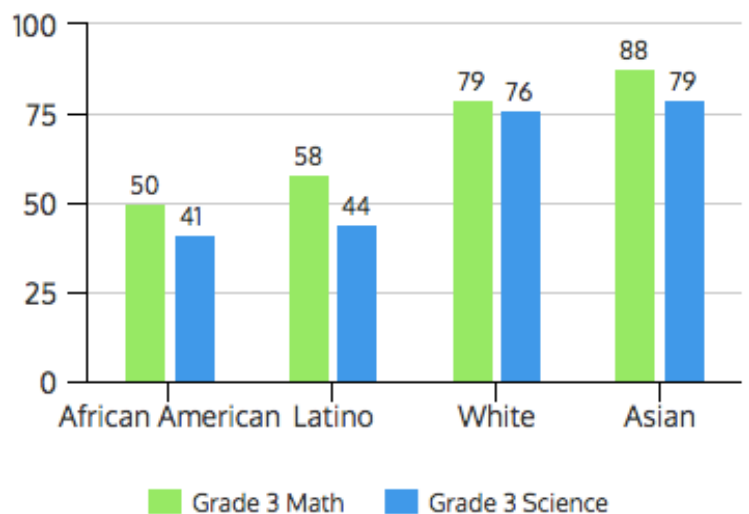
The Bureau of Labor Statistics estimates that computer and mathematical fields are expected to yield more than 1.3 million job openings by 2022. **In addition, nearly 4 in 5 new jobs created among the life and physical sciences and social services occupations group will be in occupations that typically require a bachelor's degree or higher**, and more than 2 in 5 will be at the graduate degree level.¹ However, of the students awarded a bachelor's degree in science and engineering, **only 8% is awarded to African American students and 10% to Hispanic students.**² Although there has been a big boom in STEM degrees, the increase is not spread across underrepresented groups.

A diverse workforce leads to significant economic benefits. **A company in the top quartile of racial diversity is 35% more likely to outperform a company in the bottom quartile.** For companies in the top quartile of gender diversity, they are 15% more likely to outperform companies in the bottom quartile of gender diversity³. A report by Strategy& in 2012 estimated that fully engaging women in the workforce could raise GDP by 5%.⁴ Although there are clear economic and financial benefits to an inclusive workforce, **97% of United States companies have senior-leadership teams that fail to reflect the demographic composition of the country's labor force.**⁵ A larger and more productive workforce stems from a more diverse workforce.

In order to increase diversity in Silicon Valley companies, we need to focus on engagement, recruitment, retention and inclusionary policies and programs. Not only do we have to get kids interested in STEM, but we also make sure that every child has an equal opportunity to pursue their passion for STEM. The system fails its students when in 2013-2014, **only 42 percent of all California high school graduates had completed their "a-g" requirements**⁶, including 3 years of math and 2 years of science. Increasing diversity requires expanding science and math education from elementary school all the way through high school.

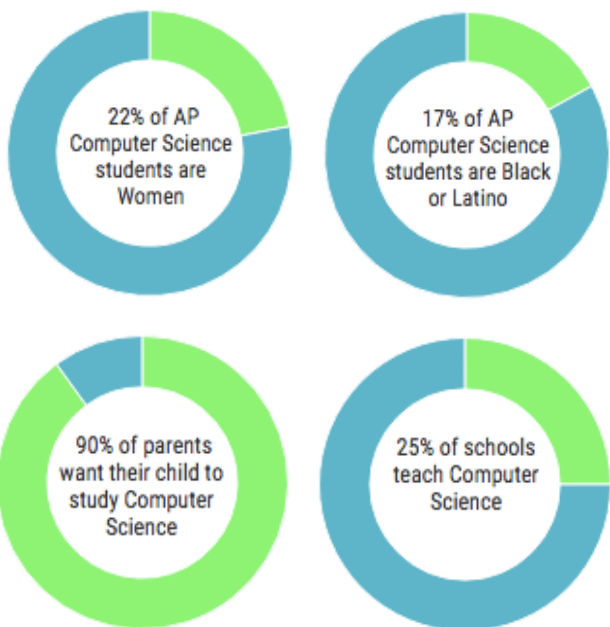
Looking at the foundation of science education reveals a systematic lack of structural and financial support, especially among students who are English Language Learners or Low-Income. In elementary school, students are not receiving enough instruction time to fully cement science basics before advancing to more complicated subject material; **40% of elementary teachers are spending less than an hour a week on science.** Even when teachers have time to dedicate to science, over 85% of elementary school teachers have not received any science-related professional development in the past 3 years and **only 31% of teachers feel prepared to teach science to a class that includes students who are English Language Learners.** Further up the administration, 60% of districts don't have a dedicated staff member for elementary science to ensure that elementary students are prepared for middle-school science. Funding for a quality science education is also crucial, proper lab equipment and textbooks often cost more than other subjects. More than a third of elementary school teachers in the schools serving the highest percentages of students in poverty identify facilities as a major challenge to teaching science, compared

Percent of students scoring proficient or advanced on California Standards Tests, 2013



with 13% of teachers in the most affluent schools.⁷ These insufficient STEM opportunities – which often fall on racial divides – leads to lower test results. 3rd grade White and Asian students have proficiency rates in Math and Science 30% higher than Black and Latino students, the gap continues through 8th grade Math and Science scores.⁸ Dedication to an inclusive and diverse workforce requires commitment across-the-board to providing students with the STEM education they need.

Leaders in different roles and across various sectors are advocating for increased access to computer science education in schools. **Only 16% of CA schools with AP programs offered the AP Computer Science course in 2014-2015.** In January 2016, President Barack Obama introduced the CS For All initiative to empower all American students from kindergarten through high school to learn computer science and have the skills they need to succeed. Part of the initiative calls for industry leaders to commit to the CS For All mission and work to increase access to computer science education. In Fall 2016, the College Board will be launching the new AP Computer Science 2 Principles course to better prepare students for college and career.



In Silicon Valley, San Francisco Unified School District and Oakland Unified School District have started to focus on Computer Science education. SFUSD has been able to incorporate CS for all students by looking at CS implementation through an elementary, middle, and high school lens. In elementary school, all students will receive about 20 hours of CS instruction integrated with literacy and math standards. In middle school, all students will take a quarter- or trimester-long enrichment course that is held during the elective periods. In high school, students will elect whether to continue studying computer science. OUSD has committed to having computer science for all students by engaging different industries to publicly support computer science implementation. **CS will be integrated into various parts of the day such as after school programs, summer programs, and internships through community partners.** As part of this program, OUSD is working with dozens of companies to provide mentoring and volunteer opportunities for their employees to work with Oakland youth.⁹

Source: Computer Science Education Week

What is the goal? Equitable access for all students who are interested and want to engage in STEM fields – a chance for

every student to take their education as far as they want to go. Not only will this engender a significant economic impact but also create a whole new generation of entrepreneurs and inventors that can start the next technological revolution.

¹ <http://www.bls.gov/opub/mlr/2013/article/occupational-employment-projections-to-2022.htm>

² <https://www.nsf.gov/statistics/seind14/index.cfm/chapter-2/c2s2.htm>

³ <http://www.mckinsey.com/business-functions/organization/our-insights/why-diversity-matters>

⁴ http://www.strategyand.pwc.com/media/file/Strategyand_Empowering-the-Third-Billion_Full-Report.pdf

⁵ <http://www.mckinsey.com/business-functions/organization/our-insights/why-diversity-matters>

⁶ <http://29v0kg31gs803wndhe1sj1hd.wpengine.netdna-cdn.com/wp-content/uploads/sites/3/2015/06/Changing-the-Equation-Report-FINAL.pdf>

⁷ https://www.wested.org/wp-content/files_mf/139932337432088StrengtheningScience_summ.pdf

⁸ <http://west.edtrust.org/wp-content/uploads/sites/3/2015/09/ETW-Sept-2015-STEM-Drought-Final.pdf>

⁹ *Landscape Analysis of Computer Science in the South Bay*, Silicon Valley Leadership Group

