

# Executive Summary

California is struggling to keep up with the increasing demand for a skilled workforce in Science, Technology, Engineering, and Mathematics (STEM), and the insufficient preparation of underrepresented students of color—who make up the majority of California’s school-aged population—is a major concern. By focusing on activating the untapped STEM talent pool, the United States can ensure students of color are prepared to enter the fastest-growing and highest-paying occupations of the future, and can increase the preparation of a homegrown talent pool to support continued growth in STEM fields and in the economy.

The pervasive achievement and opportunity gaps across California negatively impact the chances underrepresented students have to successfully matriculate through the STEM pipeline and into STEM careers. Disparities in funding, qualified teachers, course offerings, technology, and resources at the K-12 level by race and socioeconomic status impact the performance of African-American and Latino students.

Acknowledging the importance of improving STEM outcomes among California’s diverse population for both economic growth in the state and the country, this report examines the opportunities and outcomes of underrepresented students as they progress through the public education system in California. As an updated version of the previous *Dissecting the Data* report (2010), this report examines the most recent data on STEM preparation from K-12 through higher education in California and also highlights national and international comparisons in STEM education and outcomes. This report contains several key findings:

**In the early elementary grades, African-American and Latino students demonstrate much lower STEM**

**proficiency rates than their White and Asian peers, and these trends persist.**

- In 2<sup>nd</sup> grade mathematics, just over half of African-American students (51%) and Latino students (57%) reached proficiency, compared to 78 percent of White and 86% of Asian students.
- In 5<sup>th</sup> grade science, just 43% of African-American and 45% of Latino students reached proficiency. By comparison, nearly 80% of Asian and White students reached proficiency.
- By 6<sup>th</sup> grade forty-six percentage points separate African-American (35%) and Asian students (81%) in mathematics proficiency.
- The knowledge and skills developed in the early elementary years create a critical foundation for the development of later competencies, hence the educational disparities present at the elementary level significantly impact later STEM outcomes.

**In the middle and high school years, proficiency rates decline and African-American and Latino students are less likely to access and achieve success in rigorous college-preparatory coursework than their White and Asian peers.**

- Eighth grade Algebra I is viewed as a critical gatekeeper course, yet the majority of African-American and Latino students don’t enroll until 9<sup>th</sup> grade. Of those who did enroll in 8<sup>th</sup> grade Algebra I, just 29% of African-American and 37% of Latino students reached proficiency.

- Of the students enrolled in Algebra II, just 16% of African-American and 21% of Latino students reached proficiency, while Asian and White students demonstrated Algebra II proficiency rates two to three times higher.
- Less than 2 in 10 African-American students reached proficiency in chemistry in 2011, and of the students who go on to take physics, just 25% of African-American and 35% of Latino students reached proficient levels of performance.
- African-American and Latino students are considerably underrepresented in AP coursework in math and science. Latino students represent 18% of AP science and 19% of AP math test-takers, although they represent 48% of the high-school aged population in California. African-American students represent only 2% of the AP math and science test takers in California, roughly a third of their percentage within the high-school aged population.
- On the ACT college readiness exam, 40-50 percentage points separate African-American and Latino students from their White and Asian peers. On the SAT, African-American students trail their White and Asian peers by over 115 points on the SAT mathematics section, and Latinos are outperformed by roughly 90 points.
- There are roughly 7,000 more Asian students in life sciences at UC than Latino students (11,427 compared to 4,238).
- Among first-time freshman entering the CSU system in 2004, only 13% of African-American and 22% of Latino students graduated with a degree in STEM within 6 years.
- Using estimates, the total number of underrepresented students of color who graduated from UC and CSU with a degree in a STEM discipline in 2008 was 1,688.

The findings demonstrate profound inequities in both access and outcomes throughout the STEM educational pipeline. Coordinated and systematic efforts across sectors are needed to reverse these trends and re-invest in STEM education, particularly for underrepresented students of color. Drawing upon promising initiatives and practices, we highlight the following recommendations for improving the preparation of underrepresented students of color for success in STEM education and careers:

1. **Increase training and professional development opportunities for teachers within science and mathematics from pre-service to career.**
2. **Expand programs that develop early interest and counteract psychological barriers to STEM among underrepresented groups.**
3. **Increase access to rigorous and Advanced Placement courses, especially in mathematics and science.**
4. **Expand STEM acceleration and pre-college bridge programs.**
5. **Expand higher education programs that recruit and retain scholars of color in STEM fields and ensure their completion of STEM degrees.**

**African-American and Latino students are severely underrepresented in STEM enrollment in higher education in California, and demonstrate shockingly low retention and graduation rates within STEM fields.**

- There are only 4,405 African-American students enrolled in STEM disciplines across both the University of California and the California State University entire systems (3% of the population). Latinos account for only 18% of the STEM majors across both University systems.
- Only 72 African-American students are enrolled in computer science across the UC system.

*To receive information about *Dissecting the Data 2012*, or to receive a copy of the report, please e-mail [info@lpfi.org](mailto:info@lpfi.org) or call 415.946.3030.*