Chapter 12

Access, Power, and the Framework of a CS Education Ecosystem

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ABSTRACT

In the 21st century, the ability to shape, drive and innovate in computing spaces is unequivocally associated with power. However, students of color disproportionately experience the afflictions of poverty and powerlessness. Moving them from being consumers to producers of technology is one approach for changing that narrative. In the context of Computer Science (CS) education, there is much more at stake for students of color than simply joining the technical workforce. The shift to being producers of technology has disproportionate significance to students of color who would be able to perceive themselves as being in positions of technical power. This shift must begin in the current reality of the CS education ecosystem. Applying best practices for increasing diversity in engineering, we argue for a reformation of the CS education ecosystem that redistributes access and power to empower future generations of students of color, thereby broadening participation in CS.

PRODUCTION, POWER, AND PERCEPTION

The influence of technology on the economy and on everyday life in the United States cannot be overstated. Today, at the beginning of the 21st century, the ability to produce, shape, drive and innovate in technical spaces is unequivocally associated with power. Technology leaders and producers not only influence businesses in all fields, but in many ways are restructuring cultural norms. Consumers of technology, on the other hand, are being led. They are subject to the influences of the producers. Concurrent with the rise of technical influence on culture, is the rise of tremendous racial disparities. The lack of racial diversity at the elite levels of the technology sector is indicative of this reality (Jones, 2015; Margolis, Estrella, Goode, Holme & Nao, 2008). People of color are disproportionately consumers of technology. Being primarily consumers means that they are subject to a changing American reality while playing a limited role in shaping it. Moving from being a consumer to a producer of technology is one approach to changing the American power dynamic.

Making that change begins with students. For individual students of color, it is a move from consumption to production, from powerlessness to power. For communities of students it shifts the modern American story and disrupts the perceived correlation between color and power. In this era of a global knowledge-based technical economy, moving students of color from consumption to production is much more meaningful than merely improving U.S. innovation. It is an issue of both cultural and economic power.

Two men in hoodies exemplify the contrasting perceptions of power in recent years – Mark Zuckerburg and Trayvon Martin, the producer and the consumer, the powerful and the powerless. This is the context of computing education in the 21st century. Computer science is not merely an additional subject to add to a list of tests. It serves as a critical point of entry to the technology sector specifically and the creative class more generally. Increasing the number of students of color who are innovators of technology, not only diversifies the technology sector, it helps change the narrative that currently prescribes the relationship between Martin and Zuckerberg. While Mark Zuckerberg is singular in his historic influence on the tech world, he is a beneficiary of preparatory privilege (Margolis, Estrella, Goode, Holme & Nao, 2008). One important component of that privilege is the common perception that young white men are expected to be capable in technical fields. It is the corollary to the stereotype threats faced by Black and Hispanic students (Steele, 1999). Having more students of color excel in technical fields will help reshape public perception and raise expectations. That itself is a manifestation of power. Having the ability to change the cultural identity markers for students of color is an exercise of power. In the area of computing and technology, that can only occur as more students of color make the shift from consumers to producers of technology.

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