Keynote Address

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Changing Campus Culture

WHAT DO WE WANT?
EVIDENCE-BASED CHANGE
WHEN DO WE WANT IT?
AFTER PEER REVIEW
P.E.E.R. = Persons Excluded because of Ethnicity or Race

Brain drain. Students of all races filter out of science and engineering as that only a fraction of interested high schoolers—1.4%—earn Ph.D.s. But the minority pipeline, smaller to begin with, constricts even more sharply than that of the total population; only 0.4% of minority students emerge with Ph.D.s in science or engineering.

Applying to white students. This latter point is little discussed. Often "succeeding in science" connotes the careers of those minorities who blaze a trail across the firmament of a profession like hot coals in our skin, whose survival trumps open-ended new areas of thought, discovery, and innovation. Just as crucial, however, is the everyday success achieved by the cadre of scientists and engineers who continuously clarify our understanding of phenomena, improve our technologies, and teach the next generation.

We have many white scientists and engineers in this sector—the hardworking, talented, devoted beings who make our enterprise world-class—but what is strikingly and distressingly clear is that few blacks in America achieve this kind of success in science and engineering despite 20 years of effort on the part of our colleges and universities. Consider a few statistics: When I joined the faculty at Brown in 1970, there were 13 black faculty members, including myself; this year there are 17. At the University of Chicago, there were 17 black tenured and tenure-track faculty members in 1972. Twenty years later, there are 21 black members of the faculty of 1,226. Of the 30,347 full-time faculty at U.S. 4-year colleges and universities in 1987, only 1% were black. Of the 18,007 full-time engineering faculty, only 3% were black.

This lack of progress demonstrates that Americans have learned little from our 20 years of experience. One reason for our ignorance, I believe, is that we have considered the underrepresentation of minorities in science and engineering an intrinsic problem. But it is not.

In order to understand why the American education system has failed in its efforts to educate black scientists and engineers, we need to look more closely at how it has failed. According to a National Longitudinal Survey of the high school class of 1972, 40% of the black graduates who immediately entered college left within a year. The statistics are even worse for the high school class of 1982: half of the black college enrollees left before their sophomore year.

Among those black high school graduates who completed bachelor's degrees by 1980, only 16% completed their bachelor's degrees 4.5 years later, compared to 34% of whites.

It doesn't get better as the 1980s pass. In 1989, 9% of full-time freshmen planning to major in science or engineering were black. Six years later, 4.5% of the bachelor's degree recipients in these fields were black. It is no surprise then, that at a decade-end, African Americans received only 2% (264) of the more than 13,600 Ph.D.s in science and engineering awarded to U.S. citizens in 1990.

What we as a society began to recognize 20 years ago is that one key reason why African Americans are underrepresented in science and engineering is that our education system fails to retain black students—at all points in the pipeline, but especially in the undergraduate level, and in the freshman year.

The culture of science and engineering may be further misrepresentative. The common concept of "success in science" I mentioned earlier seems to create an illusion that only "the best and the brightest" can do science. Coursework is viewed by .
Increase in interest in STEM by P.E.E.R.

From Science 258: 1178 (1992) and NCSES, 2019

P.E.E.R. = persons excluded because of ethnicity or race
Many more P.E.E.R. entering....

P.E.E.R. = persons excluded because of ethnicity or race

From Science 258: 1178 (1992) and NCSES, 2019
Persistence of P.E.E.R. – nothing has changed

From Science 258: 1178 (1992) and NCSES, 2019

P.E.E.R. = persons excluded because of ethnicity or race
Changing Campus Culture

Two approaches:
(1) Student–centered
(2) Institution–centered approach

Two lessons:
(1) “theory of change”
   (i) Outcomes
   (ii) Conditions
   (iii) Activities
   (iv) Evidence
(2) Reflection and Shared Learning
Driving Change Self-study

1. What are the key contributors to how the university defines itself, and how does this identity support or impede diversity and inclusion?

2. What is the university’s assessment of the current STEM learning environment with respect to inclusion and what are the principal determiners of the environment?

3. What aspects of the current environment contribute to disparities between students of different backgrounds?
Driving Change Self-study cont’d

4. If well-prepared students are leaving STEM, why?

5. What the current efforts to increase diversity, what is the assessment of the effectiveness of these efforts, and what has the university learned from these efforts?

6. What is the current faculty perception of the value of diversity and inclusion?

7. How will the Driving Change program build upon what the university is already doing?
Changing Campus Culture

• **Institutional** – it’s the responsibility of the faculty, staff, and administration to learn and change behaviors

• **Intentional** – too urgent to leave to chance

• **Integrated** – not a “dangle”
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