Fisher v. University of Texas, Austin, Briefing on AERA, et al.

Amicus Brief On Strength of the Science

National Academy of Engineering (NAE)

“Our two largest racial minority groups comprise about one third of the college-age kids in our country, and that fraction is steadily growing. But … they earn less than 13 percent of the engineering degrees. Let me repeat this. The fastest growing segment of our young population earns less than 13 percent of our engineering degrees. Projecting forward, we have a Work Force Train Wreck. We need to take action now to avoid it.”

- Charles M. Vest, President, National Academy of Engineering

The National Academy of Engineering (NAE) is a private, independent, non-profit institution that provides engineering leadership in service to the nation. The mission of the National Academy of Engineering is to advance the well-being of the nation by promoting a vibrant engineering profession and by marshalling the expertise and insights of eminent engineers to provide independent advice to the federal government on matters involving engineering and technology. The NAE has more than 2,000 peer-elected members and foreign associates, senior professionals in business, academia, and government who are among the world’s most accomplished engineers. They provide the leadership and expertise for numerous projects focused on the relationships between engineering, technology, and the quality of life.

The 2007 report, Rising Above the Gathering Storm: Energizing, and Employing America for a Brighter Economic Future noted the need to “increase the number and proportion of U.S. citizens who earn bachelor’s degrees in the physical sciences, engineering, and mathematics.”

This growing need for an innovative and technically trained workforce was recently underscored by the release of the World Economic Forum’s Global Competitiveness Report 2012-2013 which noted that the U.S. dropped to from 5th place to 7th place in one year.

As indicated in Figure 1 underrepresented minorities made up 13.6% of all earned bachelor’s degrees awarded to U.S. citizens and permanent residents (total N = 66,529) in engineering in 2009. Caucasians earned 68.6% of these degrees; Asian/Pacific Islanders 12.4%; African Americans 4.7%; Hispanics 8.4%; American Indian/Alaska Natives 0.5%; and other/unknown race and/or ethnicity 5.4%.

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This lack of representation of underrepresented minorities (URM) in science and engineering continues into the U.S. industrial workforce as seen in Figure 2 where underrepresented men were 6% of the scientists and engineers in the industrial workforce in 2008 and underrepresented women were 4%. Scott Page, an economist and author, argues that diverse perspectives and tools enable collections of people to find more and better solutions and contribute to overall productivity. 4 Wm. A. Wulf, President Emeritus, National Academy of Engineering and University Professor and AT & T Professor of Engineering and Applied Sciences, Department of Computer Sciences, University of Virginia argued that “Engineering is a profoundly creative profession” and that “the psychological literature tells us that creativity is not something that just happens. It is the result of making unexpected connections between things we already know. Hence, creativity depends upon our life experiences. Without diversity, the life experiences we bring to an engineering problem would be limited. As a consequence we many not find the best engineering solution.” 5

The National Academy of Engineering believes that the growing representation of underrepresented minorities in the U.S. population -- currently 40% of the 18-23 age cohort -- necessitates efforts to ensure that all students have access to educational opportunities. 6 The current lack of participation of underrepresented minorities in the U.S. technical workforce as demonstrated by Figure 3 underscores the urgent need for a diverse and technically trained workforce.

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Figure 2: Scientists and engineers employed in industry by sex and race/ethnicity, 2008

NOTE: Underrepresented minority (URM) include Hispanics, Blacks, and American Indian/Alaska Natives. Other category includes Native Hawaiian or Other Pacific Islander and individuals reporting multiple races.
SOURCE: National Science Foundation/National Center for Science and Engineering Statistics, SESTAT 2008. Figure presented by Jaquelina C. Falkenheim at the National Academy of Engineering’s Workshop “Creating a Game-Changing Environment for All in the Industrial Workforce” on May 21, 2012.

Figure 3: Demographics of the science and engineering workforce: Race/ethnicity, 2008 (in percentage)

NOTE: Underrepresented minority (URM) include Hispanics, Blacks, and American Indian/Alaska Natives.