Among the most anxiety-inducing questions among government, business, and education leaders is how to maintain American competitiveness in the global economy. In reports such as 2010’s Rising Above the Gathering Storm, Revisited: Rapidly Approaching Category 5; and 2007’s Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future (published by the National Academies), we are warned that our way of life is threatened because we are in danger of falling behind in science, technology, engineering, and math (STEM), the disciplines that have powered American prosperity for decades.

The National Action Council for Minorities in Engineering, Inc. (NACME) intends to send a clear and unambiguous message that must be understood and acted upon if this nation is to retain its position of leadership in STEM and keep its competitive edge in the global marketplace of ideas and products.

That message is this: The solution to America’s competitiveness problem is to activate the hidden workforce of young men and women who have traditionally been underrepresented in STEM careers —African Americans, American Indians, and Latinos.

NACME’s research and policy analysis offer a clear warning. Although increases in minority participation in STEM have been achieved over the past three decades, the data also reveal that progress has been marginal, neither steady enough nor substantial enough for the representation of minorities to approach parity with their presence in the U.S. population. And even more disheartening, new barriers are being erected that will make it even more difficult to tap this source of talent.

Absent from STEM

The relative absence of African Americans, American Indians and Latinos in STEM study and careers, and the requirement to reverse this situation to better compete globally, is what NACME refers to as “the New American Dilemma.” The disparity in the representation of minorities, as well as women, is becoming an increasing problem for the STEM disciplines given the demographic changes occurring in society. In total, members of the three underrepresented categories (African Americans, American Indians, and Latinos) constitute 29 percent of the U.S. population now and will account for 43 percent by 2050. Yet underrepresented minorities earned just 13 percent of all engineering bachelor’s degrees in 2009. The disproportionate participation of such minorities in engineering programs is a striking testament to what is at best benign neglect, and at worst active discrimination, and that has kept these young people out of STEM programs.

It is a sad reality that over the past several decades fewer young people, both minority and non-minority, have chosen to start on the pathway to science or engineering careers. Sadder still is that fact that many of them have been robbed of the option to even consider such a career before they have left middle school. This all comes at a time when the demand for young people prepared to work in America’s high-technology industries has never been higher.

Community colleges are already a major part of the solution to the New American Dilemma. We know that 20 percent of all engineering degree recipients began their academic careers starting in and earning at least 10 credits at community colleges. More significantly, National Science Foundation data shows that 64 percent of American Indian/Alaska Native
only, 50 percent of Black only, and 55 percent of Hispanic science and engineering bachelor’s and master’s degree recipients in 2004 and 2005 attended community college. Add to this the fact that minorities make up 36 percent of community college enrollments and we arrive at a tremendous opportunity for community colleges to increase the number of underrepresented minorities successfully completing associate degree engineering science programs, transferring to four-year universities, and completing the bachelor’s degree in engineering.

How, then, might community colleges accomplish this seemingly Herculean challenge? The 2005 report, Enhancing the Community College Pathway to Engineering Careers, commissioned by the National Academy of Engineering and National Research Council (published by the National Academy) offers actionable recommendations and examples of exemplary approaches for successful transfer and articulation; recruitment and retention; curricular content, quality and standards; diversity in the engineering workforce; and data collection. NACME’s recent Research & Policy Briefs — Community College Transfers and Engineering Bachelor’s Degree Programs (2010), and Beyond the Dream: From Developmental Mathematics to Engineering Careers (2011)—(available at www.NACME.org/publications under Research & Policy Briefs) also provide directional efforts for research, practice and policy.

The Beyond the Dream: From Developmental Mathematics to Engineering Careers initiative represents the kind of bold reform in pedagogy required to advance the agenda for diversity with equity in engineering education and careers. With initial funding from Lumina Foundation for Education, NACME convened a national roundtable of mathematics and engineering science faculty members from 19 Achieving the Dream: Community Colleges Count institutions in 2009.

The roundtable explored the possibilities of Problem-Based Learning (PBL) in pre-algebra and pre-calculus courses that integrate engineering awareness, concepts and skills. Springfield Technical Community College (Mass.) participated in the roundtable and immediately began implementation of PBL approaches in developmental math and engineering in Fall 2009/Spring 2010 in Pre-Algebra, Algebra 1, and Elementary Algebra 2. Preliminary program evaluation data from this contextualized learning model looks promising, and NACME and STCC are searching for funding to deepen the engagement and expand experimentation with the model to other community colleges.

**Diversity Drives Innovation**

Too many leaders and policymakers have ignored the data and failed to recognize, or, perhaps, to admit that diversity drives innovation and that its absence imperils our designs, our products, and, most of all, our creativity — all components of competitiveness. Given that the number of college-age minority students will grow dramatically over the next decade, and that many of these students will select the community college to begin their postsecondary education, now is the time to strengthen the pathway from community college to engineering careers for these students. In our quest to confront the New American Dilemma, the time for action is now.

The dream is real, my friends.
The failure to make it work is the unreality.

—Toni Cade Bambara, 1939-1995

Irving Pressley McPhail is president and chief executive officer of the National Action Council for Minorities in Engineering, Inc. (NACME). He is chancellor emeritus, The Community College of Baltimore County; president emeritus, St. Louis Community College at Florissant Valley; and, president emeritus, LeMoyne-Owen College. This article is another in a series to be authored by principals involved in National American University’s Roueche Graduate Center and other national experts identified by the center. John E. Roueche and Margareta B. Mathis serve as editors of the monthly column, a partnership between NAU’s Roueche Graduate Center and Community College Week. For additional information send emails to mbmathis@national.edu or, call 512-813-2300.