Chapter 4
Creating a Digital Learning Community for Undergraduate Minority Science Majors

Gladys Palma de Schrynemakers
Long Island University, Brooklyn Campus, USA

ABSTRACT

Over the last three-decades, educators and policymakers have been alarmed about the state of American education and whether the Unites States can continue to lead the world in innovation. At risk is the performance of our students and their ability to be competitive in today's increasingly complex and challenging global environment. Clearly, while the importance of education in a global society vis-à-vis the welfare of a nation needs no defense, we must understand through real life experiences how complexity and competitiveness inform the global world.

INTRODUCTION

Thomas Friedman, writing in his illuminating book, *The World is Flat,* (p.8) takes a far-reaching and well-documented look at the global arena in terms of being leveled or flattened:

> *The world [is] being flattened. Clearly, it is now possible for more people than ever to collaborate and compete in real time with more other people on more different kinds of work from more different corners of the planet and on a more equal footing than at any previous time in the history of the world—using computers, e-mail, networks, teleconferencing, and dynamic new software.*

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The implications of this leveling threaten to intensify what many stakeholders already perceive as an unprecedented decline in education in the United States. For example, in a world where information is universally available, third world societies that have historically relied on the technology produced in the industrialized world now have almost immediate access to these technological capabilities. In a flat world, the rate of modernization increases significantly and homogeneously; as a result there is an acceleration in global competition that threatens the preeminence of our innovative capability.

The crisis in the academic environment is nowhere more evident or acute than in the areas of science, mathematics, and technology, which, for the most part, secured economic success and growth in the United States since the industrial revolution. Experts have reported an unbroken decline in the effectiveness U.S. science education, so much so that President Obama responded by outlining a program—Educate to Innovate—that would develop an environment that was receptive to science education and reverse the decline. In a speech delivered in 2009 (cited in the Boston Globe), the President put forth the following solution to strengthen education opportunities in the sciences and return credibility to higher education:

The key to meeting [the country's] challenges—to improving our health and well-being, to harnessing clean energy, to protecting our security, and succeeding in the global economy—will be reaffirming and strengthening America's role as the world's engine of scientific discovery and technological innovation. And that leadership tomorrow depends on how we educate our students today, especially in those fields that hold the promise of producing future innovations and innovators. And that's why education in math and science is so important."

Creating a responsive climate for science education in twenty-first century will require that we become more creative and flexible as the ethnic and racial landscape of America changes with respect to the minority populations that will be streaming into the educational pipeline. *Population Profile*, a Census Bureau report, projects that the Black population in the U.S. will grow to over 20 million by 2030 and double to 62 million by 2050. The demographics for Hispanics also predict significant increases, e.g., a doubling from 1990 to 31 million by 2015 and a four-fold increase by the middle of this century. Furthermore, the Hispanic-origin population will make up 45 percent of the Nation's population growth from 2010 to 2030 and 60 percent from 2030 to 2050. These statistics would be reassuring if these emerging populations were (1) succeeding in school and (2) successfully entering and obtaining degrees in higher education; unfortunately, the educational pipeline for Blacks and Hispanics is fractured and leaky at best, and those that manage to enter into higher education rarely leave with a degree. The tragedy of minority attrition is painfully apparent in the numbers of those select few who choose to pursue degrees in the sciences, mathematics, and technology. Even for those who succeed, the trajectory is almost never a smooth or seamless one. For example, the American Council on Education reported in *Increasing the Success of Minority Students in Science and Technology* (2006) that although minority students entered into Science, Technology, Engineering, and Mathematics (STEM) majors at the approximately the same percentage as white and Asian counterparts their completion rates were significantly lower. Over the next decade and well into this new century, our nation will be challenged not only to fill the vacancies in the job market created by attrition and an aging workforce, but also to produce credible workers to fill the burgeoning field of science across wide-ranging venues. How well we respond to the realities of worldwide society and economy will determine if we can continue to lead the world in innovation. The choices we make in educational policies and practices must be aimed at nurturing young people, particularly in Black and Hispanic communities, and encouraging them