

The Professional Science Master's Degree

By Heather Grinager

To remain competitive, America needs to stimulate economic growth.

National organizations such as the Business Roundtable and the National Academies of Science have recently sounded an alarm about America's ability to remain competitive in the world economy. Both have called on policymakers to take action to stimulate economic growth. Recommendations often focus on science, technology, engineering and math education.

Long before these reports, some institutions of higher education were responding—not only to the call for more graduates in math and science generally, but specifically to workforce needs—with a new degree, the Professional Science Master's (PSM), aimed to produce science and math-trained professionals. The PSM, designed by faculty in conjunction with business and industry advisers, combines graduate training in an area of science or mathematics with courses in business, patent law, regulatory affairs, project management and information technology to prepare students specifically for non-research careers in business, government or the independent sector.

Imagine, for example, someone with a background in genomics and computer science who also can write a business plan and interpret a budget or financial statement, or someone who has been trained in biotechnology who also can negotiate with the Food and Drug Administration, work on a patent law team, or lobby Congress.

The PSM degree addresses concerns about workforce needs.

The PSM helps address many concerns policymakers have about the mismatch between the quality of math and science education and 21st century workforce needs. The degree is more flexible than a Ph.D. because it takes less time to complete and focuses on practical applications of existing and new research. Furthermore, it appears to be especially attractive to women, who make up 43 percent of current PSM enrollees. Also of interest to state legislatures is that, as a rule in all fields, master's students come from the local region and remain in the region after graduation (unlike Ph.D. students, who apply for jobs nationally and internationally). The PSM degree, then, becomes a means of training and retaining science and math professionals in the area. Finally, because more Americans will be trained in emerging scientific and mathematical fields, the degree potentially can help negate universities' reliance on foreign students and outsourcing.

State Action

North Carolina's legislature directed a study of educational program needs.

In North Carolina, state legislators recognized the importance of aligning higher education with the state's workforce needs and took legislative action. In 2003, the North Carolina legislature—through HB 1264—directed the University of North Carolina and the State Board of Community Colleges to conduct a comprehensive study of the mission of and educational program needs for the institutions, “to ensure that the State's citizens are academically prepared and equipped for current job opportunities and jobs of the future in North Carolina's growing knowledge economy.”

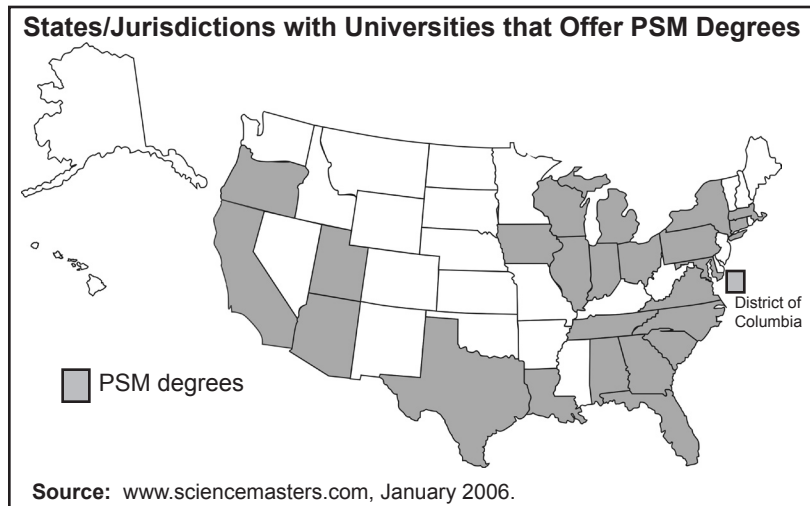
The resulting report notes the gap between master's degrees granted and those required in the North Carolina workforce, and identifies the PSM degree as one way the university already is addressing this state need.

State legislators who are interested both in advancing their state's math and science agenda and the fit between higher education and state workforce needs may want to learn more about PSM programs offered at institutions in their state or region. They also could meet with program directors to explore how the state might work with universities to support or expand these programs.

Legislators can explore ways to support or expand university PSM programs.

Federal Action

The National Innovation Act of 2005 was introduced in Congress in December 2005. As the legislation currently is written, it "encourages universities to develop Professional Science Master's Degree Programs as a means of increasing the number of highly skilled graduates entering the science and technology workforce." The bill authorizes \$20 million for PSMs in FY 2007 and an equal amount in succeeding years. The program is to be administered by the National Science Foundation to "...fund improved or additional PSM programs in up to 200 universities."



A total of 101 PSM programs have been established at 54 universities in 24 states and the District of Columbia. More than 1,200 students are enrolled nationally, and more than 660 graduates are in the workforce. PSM degrees have evolved in a multitude of ways and cover a wide area of disciplines. The largest number of degrees are in biotechnology, bioinformatics, biostatistics, and financial mathematics, but some are more specialized, such as nanoscale physics, geographical information systems, and human-computer interaction.

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Selected References

Comprehensive Web site of all professional science masters degrees, www.sciencemasters.com.

Council of Graduate School Web site with sample curriculum, <http://www.cgsnet.org/mastersprograms/index.htm>.

National Academy. *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*. Executive Summary. Includes policy recommendations for increasing number of science and math students, http://www.nap.edu/execsumm_pdf/11463.pdf.

National Innovation Act of 2005, sponsored by Senator John Ensign (Nev.) and Senator Joseph Lieberman (Conn.), http://www.aau.edu/research/NIASBS_113005.pdf.

North Carolina HB 1264 requires assessment of the state higher education system's ability to meet the needs of the 21st century workforce, <http://www.ncleg.net/Sessions/2003/Bills/House/HTML/H1264v5.html>.

Contact for More Information

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