



October 8, 2015

The Honorable Cory Gardner
Committee on Commerce,
Transportation and Science
United States Senate
Washington, D.C. 20510

The Honorable Gary Peters
Committee on Commerce,
Transportation and Science
United States Senate
Washington, D.C. 20510

Dear Senators Gardner and Peters:

On behalf of the Council of Graduate Schools (CGS), I want to thank you for providing another opportunity for stakeholders to submit input with respect to “Building a STEM Workforce” that the Senate Committee on Commerce, Transportation and Science will consider throughout the process of reauthorizing the America COMPETES Act. CGS’ membership includes over 500 universities that confer the vast majority of doctoral and master’s degrees awarded in the U.S.

According to the data from the U.S. Bureau of Labor Statistics, STEM related occupations (not including health professions that require professional degrees, such as M.D.) that require master’s or doctoral degrees at the entry-level are expected to grow by 21% between 2012 and 2022. When combined with job openings due to replacements, there will be about 690,000 STEM related jobs that require advanced degrees into 2022. This demand will be difficult to fill if policies are in place that discourage individuals from pursuing advanced degrees, such as some of the changes made in federal student loan programs.

CGS has a number of promising research-driven best practices that have identified priorities that the working group may want to consider in developing policies that encourage and build a STEM workforce. These include:

Professional Science Master’s Degrees (PSM) – PSM programs integrate advanced science training in combination with key business principles and professional skills that focus on communication and entrepreneurship. The degree has created multiple career pathways for scientists who are making important and innovative contributions to the knowledge economy. Graduates of these programs have the scientific research skills needed to advance science along with the business and professional acumen required to create the new ideas needed to advance economic growth. The workforce demand for master’s degree holders in STEM is increasing. One option that can fulfill this need is federal investment in cross agency programs that use the PSM model.

Professional Development Programs – More graduate degree holders than ever are seeking and finding careers outside of the academy. A factor that is becoming increasingly important is the need to expand master’s and doctoral programs to prepare their graduates to successfully fulfill the full range of careers open to them. This

outcome can be achieved through support for traineeships, enhancement of PSM programs, and integration of professional development activities into research assistantships. Best practices models that incorporate professional development have prepared graduate degree holders to pursue STEM based careers in business, government, and non-profits, and should be included as an integral part of research grant funding.

Preparing Future Faculty (PFF) – The Preparing Future Faculty (PFF) program initially began as a way to address the concerns that universities were not doing enough to prepare graduate students with the full range of careers skills expected of faculty and that insufficient attention was being paid to the quality of undergraduate teaching. Over time the number of PFF programs has grown and the way aspiring faculty members are prepared for their careers has improved. PFF and other, similar programs now provide doctoral students, as well as some master’s and postdoctoral students, with opportunities to observe and experience faculty responsibilities at a variety of academic institutions with varying missions, diverse student bodies, and different expectations for faculty. PFF programs are an excellent way to prepare future faculty and teachers, whether they go into K-12 education, teach at community colleges or assume faculty positions at four-year institutions of higher education. As a result of these programs, future educators are better prepared to teach STEM, understand how to address the needs of diverse student populations with a broad range of career expectations, and can better assess the learning outcomes of their students. Federal investment in preparing future faculty is an increasingly important factor when considering the needs of a STEM educated workforce.

Diversification of the STEM Workforce – A recent CGS report of the results from a NSF grant, “Doctoral Initiative on Minority Attrition and Completion (DIMAC)”, provided completion and attrition rates, times-to-degree, and times-to-attrition of underrepresented minorities (URM) STEM doctoral students using data spanning academic years 1992/93 to 2011/12. One finding was that completion outcomes vary by student characteristics, some of the most notable differences emerging from the analysis of race/ethnicity and field of study. Another finding was that the ten-year completion rate was higher for students who had prior master’s degrees.

The analyses of data discussed in the DIMAC report revealed that challenges regarding persistence, attrition and completion could be mitigated to some extent. Institutions of higher education need to consider the following actions that may result in higher completion rates for URM doctoral students in the STEM fields:

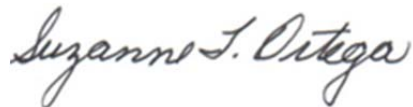
- Conducting interventions early and often during the student’s entire course of study and through the thesis and dissertation stage, including communicating with incoming students expectations and helping students become acclimated to the doctoral program culture;
- Providing enhanced academic supports such as writing classes and mathematics and statistics supplements;
- Monitoring and evaluating programs and interventions toward program improvement; and

- Cultivating a culture of diversity and inclusion by adoption of best practices in recruitment, funding and support for students from underrepresented groups.

To encourage URM STEM students to pursue master's degrees as a way to increase doctoral program completion, consideration may need to be given to the federal financial support that is available to them while pursuing master's degrees. Changes to the federal student loan program have increased the overall cost of borrowing for graduate students. They are no longer eligible for subsidized loans, and the interest rates are higher. Further, they are not eligible for Pell Grants. One important suggestion is for Pell-eligible students who wish to continue their education and pursue STEM master's degrees to continue to receive Pell Grants up to the maximum number of semesters for which they can be awarded Pell Grants.

Again, I thank you for this opportunity to offer input into the process and look forward to working with you to reauthorize this important law.

Sincerely,

A handwritten signature in cursive script that reads "Suzanne T. Ortega".

Suzanne T. Ortega
President