

PRESS RELEASE

FOR IMMEDIATE RELEASE:

February 27, 2017

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Report Recommends Broader Professional Development for Graduate Students in STEM Fields

Employers, Graduate Schools Aim to Narrow Gap between Workforce Needs and Graduate Training

Washington, DC — Graduate schools and programs play a key role in preparing students for the knowledge workforce, but more work needs to be done, according to a new [report](#) by the Council of Graduate Schools (CGS). Currently, the preparation of US graduate students is too narrowly focused on academic research skills, at the expense of professional skills such as communication, teamwork, mentoring, and leadership.

Most STEM PhDs and master's degree recipients work in careers outside the academy. To improve graduate student preparation for multiple career pathways, CGS conducted a two-year project to map the landscape of STEM professional development programs with support from the National Science Foundation (#1413827). Project activities included a survey of over 900 university deans, STEM faculty, and professional development staff at 226 institutions; interviews with employers from across the STEM workforce; and a workshop of industry leaders, federal science agencies, entrepreneurs, graduate deans, researchers, and recent PhDs and postdocs.

"The good news coming out of this project is that graduate institutions are devoting considerable time and resources to broadening the professional preparation of students in STEM graduate programs," said CGS President Suzanne Ortega. "But to ensure that students succeed, we will need to make it easier for them to access high-quality resources. Our ultimate goals should be supporting student success in a range of career paths, and promoting the health and competitiveness of the STEM workforce."

Sharing a perspective held by many employers, Brian Fitzgerald, CEO of the Business-Higher Education Forum, said that innovation increasingly relies on a workforce that possesses cross-cutting skills, preferably those in technology. "Many employers seek to collaborate with universities to address the STEM skill demand. Businesses benefit from these partnerships because they get critically needed talent, and universities benefit because their students graduate with job-ready skills."

Key Project Findings

1. Employers outside the academy seek broad "transferable skills" as well as specific scientific skills in graduates with advanced STEM degrees. Skills most frequently mentioned by employers as lacking include data science and big data skills; science policy; governance, risk, and compliance; and time-, project-, and budget management. Currently only about one in 10 programs addresses these needs

2. Approximately six out of 10 universities reported offering structured professional development programs to help STEM graduate students develop skills beyond academic research. While programs vary in content, the most common emphasis is on preparation for academic careers and on transferable skills such as written and oral communication and interdisciplinary and intercultural teamwork.
3. Low student participation in professional development programs is a common challenge for most universities. Two factors that can prevent students from obtaining valuable skills needed for career success after graduation are student concern that faculty do not value broad professional development and careers outside academia, and federal funding structures that do not give incentives for broad professional preparation for STEM graduate students.
4. Graduate schools play a key leadership role in shaping, supporting, promoting, and sustaining professional development for graduate students who will pursue a broad array of advanced STEM and non-STEM careers. Most graduate schools do so in collaboration with staff and/or STEM faculty, combining centralized and program- or department-based activities.

Report Recommendations

The report includes recommendations for improving professional development of STEM graduate students in research degree programs. These include:

1. Improving coordination among graduate schools, graduate programs, employers, alumni, and federal funding agencies to ensure graduate student financial support and graduate education are more strategically aligned.
2. Increasing efforts to ensure professional development experiences provided to advanced STEM graduate students are relevant to employers.
3. Gathering and sharing more evidence about the effectiveness of different models for delivering relevant professional development programs to graduate students.
4. Improving assessments of professional development programs, addressing efficacy as well as student satisfaction. Best practices are also needed in the use of these data to inform graduate degree programs and professional development programs.

Survey findings were used to develop a searchable [online database](#) of university professional development programs for graduate students, which universities can use as models for developing new programs or improving existing ones.

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The Council of Graduate Schools (CGS) is an organization of approximately 500 institutions of higher education in the United States and Canada engaged in graduate education, research, and the preparation of candidates for advanced degrees. The organization's mission is to improve and advance graduate education, which it accomplishes through advocacy in the federal policy arena, research, and the development and dissemination of best practices.