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Supporting Career Diversity and Professional Development in Doctoral Education

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Council of Graduate Schools (CGS)

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# What is the Council of Graduate Schools?

- CGS's Mission: advancing master's and doctoral education & research
  - Advocating, demonstrating impact
  - Research and Best Practices
- ~ 500 member universities in the U.S. and Canada and 25 international members
  - Members represented by graduate deans
  - Some deans share oversight for both research and graduate education

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Obstacles to broadening career preparation for graduate students

- Funding mechanisms and incentive structures that prioritize faculty research (Stephan 2012).
- Lack of information about the nature of PhD careers outside of academia.
- Lack of resources for university professional development programs (CGS 2017).
- "Misalignment" between period when students develop career interests and the timing of structured career development opportunities (Gibbs *et. al.* 2015).
- Perception that broadening career preparation compromises program quality.

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National calls to action are part of the solution

- National calls to prepare graduate students for a more diverse range of career pathways:
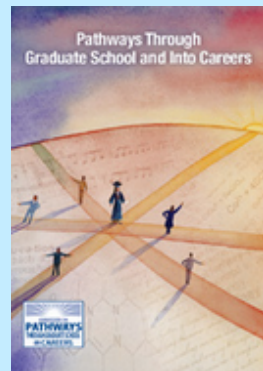

- NIH's "Broadening Experience in Scientific Training" (BEST)
- NSF funding priorities: National Research Traineeship (NRT) program seeks to prepare STEM professionals with skills applicable to a range of careers.

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Program-level data on PhD careers are critical to changing the status quo

- Allow students to make more **informed selections** of PhD programs (or to choose other paths).

- More effectively **engage faculty** in conversation about the career paths and professional development of their own students and alumni.

- Provide an important measure of student success and **program quality**.

- Inform **improvements** of student career preparation.

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Understanding PhD Careers for Program Improvement

Understanding PhD Career Pathways for Program Improvement
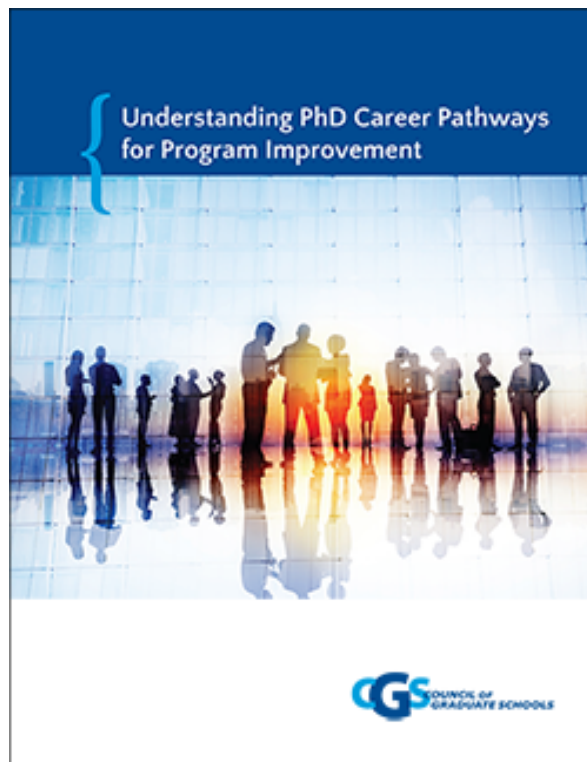
CGS project supported by the National Science Foundation (#1661272) and the Andrew W. Mellon Foundation.

Builds upon 2014 CGS feasibility study and a planning phase funded by Mellon, NSF, and the Alfred P. Sloan Foundation.

A Coordinated Effort to Gather and Use Data on PhD Students & Alumni

- Multi-university implementation of two CGS-designed instruments
- Will capture data from matriculation through 15-years post-graduation
- Includes STEM, humanities and social science fields
- Participating universities will test methods of supporting successful implementation
- University partners will develop approaches to using the data to improve programs.

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What kind of data are captured by the survey instruments?

- Work attributes
- Skills acquired through professional development opportunities during graduate school
- Employment and occupational preferences
- Employment and occupational outcomes
- Sociodemographic information

What do we mean by "program improvement?"

- Multiple definitions of career success for PhDs
- Expanded Curricular and Professional Development Opportunities
- Mentoring for Varied Career Pathways
- Improving Career Services

Professional Development: Shaping Effective Programs

PROFESSIONAL DEVELOPMENT
Shaping Effective Programs
for STEM Graduate Students

According to a CGS Survey, the approach most commonly used to assess professional development programs is participant satisfaction and participation metrics.

Skills Gaps and Unmet Needs in STEM (CGS 2017)

General

- Writing, speaking, and presentation, including effective PowerPoint.
- Cross-disciplinary and cross-cultural communication and teamwork.
- Time management and project management in an experiential context.

STEM-specific

- Analytics, data science
- Statistics and computational ability, especially in working with big data
- Genetics and genomics
- Cognitive computing
- Information Systems that can keep up with the pace of change
- Lab Safety

Skills Gaps in the Biomedical Research Workforce

Skill Category	Skills
Financial and process improvement	Accounting, operations analysis, financial analysis, economics
Project management	Planning, budgeting, organizational skills, problem-solving
Leadership development	Collaboration, mentoring, supervisory skills
Business acumen	Business development, business administration, business management
Communication	Writing, presentation skills, negotiation, and persuasion
Policy and regulation	Risk management, compliance, product and drug development
Academic culture	Mentoring, academic advisement, curriculum development, grant writing
Programming languages	JAVA, PERL, Linux, Python, C++, SQL
Statistical analysis	Data analysis, SPSS, SAS

Source: Mason, JL, Johnston, E, Berndt, S. Segal, K, Lei, M., & JS Wiest (2016). *Labor and skills gap analysis of the biomedical research workforce*. FASEB J. 30.

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Three Broad Recommendations

Develop better metrics for assessing professional development experiences

- Career Outcomes?

- Time to Degree?

- Learning Outcomes?

- Other metrics?

We look forward to continuing to learn from NIH BEST projects!

Recognize factors– beyond funding– that may help faculty support change

- Desire to keep pace with leading programs ("Our peers are doing it, our aspirational peers are doing it, so we had better do it too….)

- Desire to improve program quality.

- Clearer understanding of the long-term outcomes of their investments in students.

Develop networks of multiple institutions around shared goals

- Focus on consortia and multi-institutional efforts (like BEST and CGS's PhD Career Pathways) that offer prestige as well as opportunities for benchmarking and exchange of best practices.

- A high-profile, "strength in numbers" approach can help change the perception reforms pose risks to the prestige and productivity of departments, programs and PI's.

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Thank You

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