In Their Own Words: Empowering PhD Graduates with Essential Career Skills— Insights from Recent Alumni

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Background

In 2021, just over half of research doctorate recipients in the U.S. opted out of tenured faculty jobs for careers in industry, business, government, and non-profit organizations (National Center for Science and Engineering Statistics, 2022). As PhD students become more aware of the career options available, they are actively participating in professional development opportunities, including teacher preparation, academic and non-academic writing skills, career preparation, research ethics, grant writing, data analytics, and project management (Garcia & Zhou, 2022; Mitic & Okahana, 2021; Rizzoli et al., 2016).

To contextualize CGS's quantitative research on PhD career pathways (Okahana & Kinoshita, 2018; Okahana, Zhou, & Kinoshita, 2019; Mitic & Okahana, 2021), the Council of Graduate Schools (CGS) conducted interviews to collect student narratives about their transitions from graduate school to postdoctoral study to their chosen careers. Results indicate that over the course of their graduate study, PhD graduates had a genuine interest in diverse career pathways but experienced barriers to exploring diverse career options, including lack of faculty support or mentors with connection to industry for non-academic jobs. Based on the interviews, a majority of participants chose careers in industry (Figure 1). Additionally, they wished they had been prepared for a range of careers (49%) and expressed an interest in acquiring interpersonal skills (20%) and opportunities to attend diverse career panels (20%) during their doctoral studies (Figure 2). Insight derived from these interviews can serve as conversation starters about broader opportunities to prepare for PhD professional development and provide resources that will support the career success of doctoral students.

Takeaway Points

- PhD students highly value and require career transparency about career options in different workforce sectors—both in and beyond the academy.

- Doctoral alums participating in this study indicate that they have expanded their graduate experiences and job prospects beyond academia. However, some participants perceived little support for non-academic career choices from faculty who, themselves, often lacked industry connections or knowledge. While these alumni did find rewarding career pathways, they largely did so despite a lack of mentoring and professional development.

- Lack of information about real-world work and applied skills outside academia is another challenge for graduate students pursuing non-academic careers. For example, translating PhD skills into a resume for non-academic jobs is one of the skills that participants wished they had had.

- Across various disciplines and employment sectors, PhD graduates identified similar job skills that are essential for a successful career within and outside academia (Okahana et al., 2019), such as non-academic writing, project management, and additional research methods. Participants suggested the need for a trainee-centered perspective in PhD training (Bixenmann et al., 2020) and more robust collaboration with industry, non-profits, and government.

Figure 1. Careers of participants by field of study after earning their PhDs.
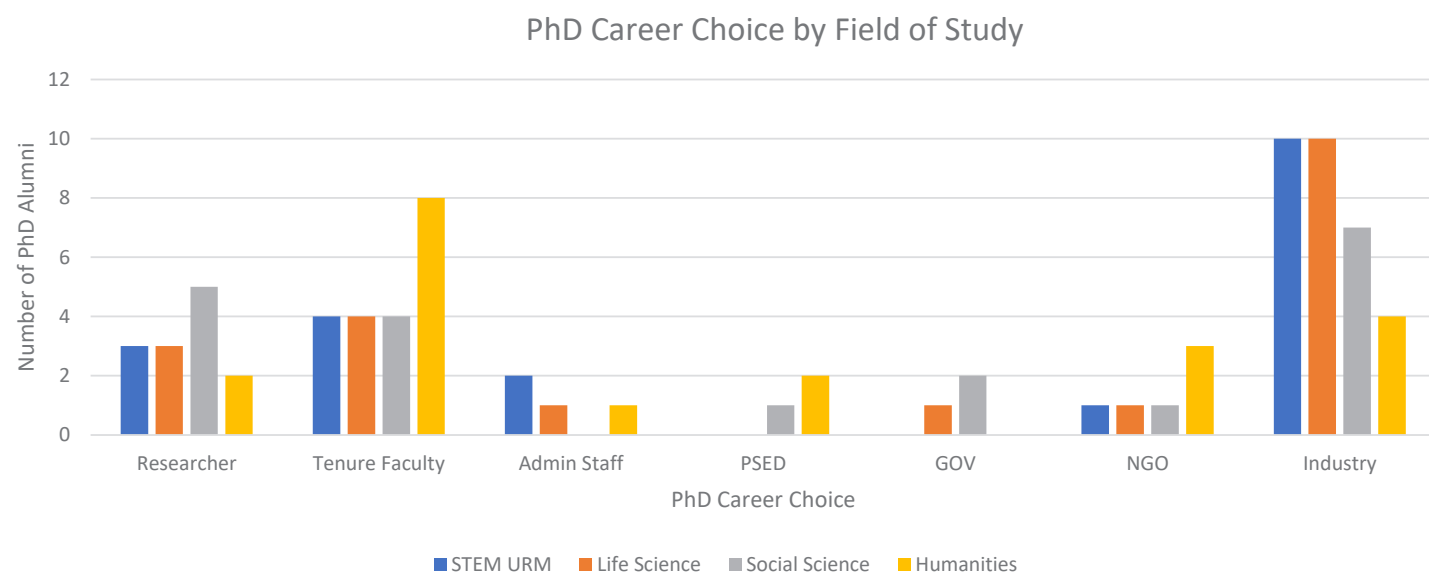
Eighty PhD alumni who expressed a willingness to be recontacted were interviewed. They represent the broad fields of humanities, social sciences, and life sciences. They also include underrepresented minorities (URM) in STEM as well as those with careers in higher education (HIED), industry, nonprofit organizations (NGO), primary and secondary education (PSED), and government (GOV). The career and demographic characteristics of respondents are shown in Figure 1. Below we explore answers to the interview question, "What skill sets, and career development opportunities do you wish you had before transitioning from your doctoral studies?"

Key Findings:

- **PhDs are self-navigating their career paths and development to fit their PhD training, interests, desires for work-life balance, and geographic location.** These alumni knew tenured faculty positions were highly competitive and that adjunct jobs did not pay well from personal experience and from their colleagues. PhD students weighed their strengths, research training, and professional development opportunities and applied them to their job prospects.

  For example, after finishing his coursework at a university in the Southwest region, Emilio got permission from his dissertation committee to move and finish his dissertation on the East Coast. Emilio explained:

  > "Well, frankly, it was an issue of there being too many people graduating with PhDs in political science and not enough jobs at the time when I was coming out. And the jobs that people were getting, people who I knew, people who I trusted, people who I respected, they were getting adjunct jobs and things that, frankly, I didn't go into getting a PhD to do that. And so I knew that the skills that I had learned in graduate school, just basic things like research design, critical thinking, and then more technical skills like advanced statistics and things like that would be useful in a lot of different fields. And for personal reasons, we chose the Washington, DC area. But from a professional side, it really was an issue of there were not really the right kind of jobs. So that's why we did what we did." (*Emilio, Social Science, Industry*)

- **According to our interviewees, guidance for communicating PhD skills in a resume for non-academic jobs is not provided in graduate programs.** Most university career centers focused on undergraduate students, and many graduate programs did not have professional development opportunities explaining and relating PhD skills to non-academic jobs on a resume or for an interview. PhDs also expressed a desire for exposure to diverse academic and non-academic career panels, developing soft skills, preparing for interviews and job talks, various types of writing and publishing, technology skills, and additional research skills would have been helpful (Figure 2).

  > "I think some coaching from a PhD dissertation to work in industry would have been helpful...And then learn how to communicate that in your resume." (*Cali, STEM, Industry*)

Figure 2. Skills and opportunities that PhDs wished they had as they transitioned from PhD to a career.

PhDs' Wishlist of Skills to Develop During PhD Program
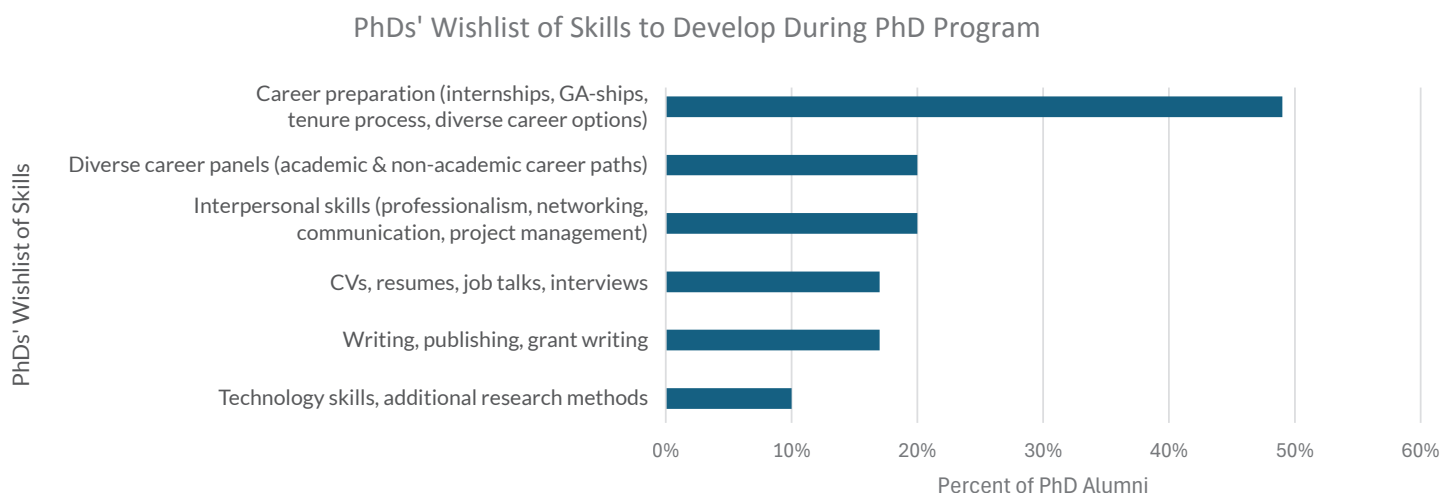
- **Doctoral students wished they had learned about the diverse careers that PhD holders had.** Doctoral students appreciated diverse career panels and alums in making their connections by following up with panelists and alumni and developing their career paths. PhDs wished their supervisors and graduate program had connections or partnerships to industry, business, and government to know what types of jobs were out there and what employers are looking for. One respondent shared:

    > "It would have been really useful to have a better sense of all things that PhDs do out in the world…just those connections or just a sense of what's out there…because you're taught to play up your specific research, but you're not taught to play up your skills." (*Ashley, Social Science, Industry*)

- **In addition to better preparation for careers beyond the academy, doctoral students expressed the need for more transparency about the path to tenured faculty positions** as well, such as the tenure process, grant writing, project management and seeing a project through, how to publish, networking, and collaborating with colleagues at conferences or in other disciplines. Likewise, PhDs wanted to be advised and supported on pursuing academic careers outside of teaching, such as administration, academic affairs, and student affairs. Doctoral advisors and supervisors have a significant role in preparing doctoral students for academic careers. Gina's advisor guided her towards academia, serving as both a mentor and a role model. Her advisor fostered an environment that enabled her students to apply those skills in various career trajectories. Gina shares her experience in the lab with her advisor, which prepared her for her current position as a faculty-researcher in STEM. In her own words, Gina stated:

    > "I learned by example. I saw how my adviser runs the lab, how she mentors students, and different types of students in the lab. I got a better sense and idea of what it takes and how it is to be successful…She really created a positive environment in the lab that everyone feels pleasant to go and interact with people in the lab and work on their projects in a non-competitive manner. So all those things, I think, just prepared me… A lot of Ph.D. students or postdocs coming out from her lab all went to many different areas like teaching, industry, scientific writing, lots of different things. So she didn't really push anyone to any direction." (*Gina, STEM, faculty*)

Implications for Practice

- Good mentors provide advice and support that is consistent with the career aspirations of their mentees in academia, business, and non-governmental organizations.

- Graduate programs and graduate schools can offer career or alumni panels or contact lists to support students interested in diverse career paths.

- Graduate schools must work with graduate programs to ensure students can access professional development opportunities that meet their needs.

- Graduate programs can create capstone and dissertation requirements that better reflect writing for careers in business, government, and non-profit organizations.

- Graduate programs can offer seminars that explore diverse career options in both academic and non-academic sectors. Engaging alumni to return and impart their career journeys, along with organizing diverse alumni panels, can provide invaluable insights.

- Institutions should offer professional opportunities tailored to diverse career choices, including communication and writing workshops, both academic and non-academic resume writing workshops, interview preparation for non-academic jobs, and job talks for academic positions.

Conversation Starters for PhD Professional Development

We encourage graduate schools and departments to discuss career diversity and professional development opportunities and consider whether these opportunities prepare students for diverse careers. Questions you may want to ask your graduate school staff, college deans, and graduate program directors include:

- What professional development opportunities do your institution and graduate programs offer PhD students? What institution-wide resources, as well as program-specific resources, are available?

- Are professional development opportunities meeting the diverse needs of PhD students?

- How can graduate schools and graduate programs work together to ensure PhD students have opportunities for professional development?

- What are your institution and PhD programs doing to foster partnerships with industry, government, and other institutions to create opportunities for PhD students interested in pursuing non-academic careers?

About the Data Source

This brief is based upon data from the CGS PhD Career Pathways Project follow-up interviews, which included 80 doctoral degree recipients. The interviews were conducted between 2021 and 2022. The recruiting process included maintaining close numbers of gender and diversity, with 54% female, 46% male, and 31% identifying as students of color. All participants but one attended an R1 research university, with 83.5% being public universities. Lastly, participants were broadly selected from institutions across the United States from the Midwest region (27.5%,) Northeast (20%,) Southeast (12.5%,) Southwest (14%,) and West (26%). Recruitment and follow-up were more responsive from the Midwest, West, and Northeast regions than from the Southeast and Southwest regions.

Additional Resources

CGS PhD Career Pathways Research Briefs: The research briefs that have resulted from CGS's analysis of national data can help institutions contextualize their own institution's data, inform programs about alumni outcomes at the national level, and start conversations about skills and resources that will support the career success of graduate students. The project research briefs are available on the *CGS website*.

CGS PhD Career Pathways Data Dashboard: The *data dashboard* provides an overview of the graduate school experiences and career outcomes of PhD alumni. Deans and other researchers can use the filters, interactive graphs, and views to better understand the career trajectories of PhD alumni across demographic groups, fields of study, and job sectors.

CGS Resources for Mentoring: These *mentoring resources* are targeted to different roles, although some overlap. Some individuals, such as postdoctoral students, may find that they are being mentored and mentoring others in about equal measure, and may benefit from multiple resources depending on the situation.

CGS Resources for Graduate Student Professional Development: CGS has led a series of Best Practices projects in the professional development domain, including a project on STEM Professional Development, the NextGen PhD Consortium, and the Humanities Coalition. Project reports and resulting resources for graduate schools are available on the *CGS website*.

CGS Communications Guide for Career Diversity: CGS has developed a *communications resource* designed to help university partners advocate for greater transparency about PhD careers and support career diversity. The tool includes tips for supporting career diversity in campus social media and guidance on communicating the value of diverse careers.

References

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The CGS PhD Career Pathways Coalition

CGS PhD Career Pathways built a coalition of 75 doctoral institutions working to better understand and support PhD careers across all broad fields of study. Over the course of the project, universities collected data from current PhD students and alumni using surveys that CGS developed in consultation with senior university leaders, funding agencies, disciplinary societies, researchers, and PhD students and alums. The resulting data has allowed universities to analyze PhD career preferences and outcomes at the program level and help faculty and university leaders strengthen career services, professional development opportunities, and mentoring.

About CGS

For over 60 years, the Council of Graduate Schools has been the only national organization dedicated solely to advancing master's and doctoral education and research. CGS members award 86.9% of all U.S. doctoral degrees and 59.8% of all U.S. master's degrees. CGS accomplishes its mission through advocacy, developing and disseminating best practices, and innovative research.

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