

WIP: GradBridge - Building Cross-Institutional Mentoring Circles to Support Engineering Career Development for Graduate Students and Postdoctoral Scholars

Dr. Jacqueline E McDermott, Purdue University at West Lafayette (COE)

Dr. Jackie McDermott is the Associate Director of Graduate Student Excellence in Purdue Engineering's Dean's Office for Graduate Education. She joined Purdue in 2018 and leads initiatives supporting graduate student success across both the West Lafayette and Indianapolis locations. She holds a B.S. in Biology from Hofstra University and a Ph.D. in Molecular and Cellular Biology from Brandeis University. As a first-generation graduate student, she is dedicated to helping students thrive in graduate school and beyond.

Dr. McDermott oversees programs that strengthen research communities, enhance professional development, and align graduate education efforts across campuses. She serves as Co-PI on multiple Alfred P. Sloan Foundation grants expanding access to engineering graduate education and researches mentoring models, community building, and program scalability. She also founded EngGAP, a NAGAP professional community for engineering graduate education practitioners, and advises the Engineering Academic Career Club (EACC) at Purdue University.

Meltem Erol, University of California, Berkeley

Meltem Erol is the Director of Graduate Student Services in the College of Engineering at the University of California, Berkeley. She has a Masters degree in Higher Education from Stanford University and over 20 years experience in higher education administration, including serving on the executive board of the National GEM Consortium, a fellowship program for graduate students in STEM. Meltem supports all graduate students in the College of Engineering, and is particularly interested on the impact student labor unions are having on graduate education.

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Abstract

Mentoring is an integral part of graduate education. Specifically, mentoring is important for advisor-advisee relationships, for continual progress in a graduate program, and for graduate students to think about their next step: achieving a fulfilling career. Mentoring has been shown to contribute to career readiness, persistence, and overall success at both the master's and doctoral levels. In order to ensure that graduate students and postdocs feel confident in their career readiness and transitions, there is a strong need for an intentional focus connecting career development with graduate education opportunities provided by universities. While resources exist at the university level to support career development for undergraduate students, there is typically little intentional focus on mentoring for career development of engineering graduate students and postdoctoral scholars.

To address this gap, we developed GradBridge, a new cross-institutional initiative connecting graduate students from two large Research 1 (R1) universities through structured mentoring circles. Each mentoring circle pairs eight graduate students and postdoctoral mentees with two mentors from various engineering focused sectors, fostering conversations on professional development, career pathways, and competency-building. The program's goals are to connect graduate students and postdocs with experienced mentors, peers, and career insights. GradBridge helps participants navigate different career paths in engineering—whether in academia, industry, government, entrepreneurship, or other sectors.

Here, we describe the program's design, curriculum, recruitment practices, and unique partnership between two R1 universities. We share aggregate data from the initial application cycle for mentees and mentors, as well as best practices and challenges faced in developing this new initiative. Finally, we discuss existing initiatives and research within the career development landscape specifically tailored for engineering graduate students and postdoctoral scholars. This Work in Progress contributes to the growing body of research on engineering graduate career development and offers a promising framework for promoting community and career readiness among engineering graduate students.

Literature Review

Traditional mentoring models in higher education have historically emphasized dyadic, hierarchical relationships - between a senior faculty member and a junior scholar. While effective in some contexts, this model has limited scalability, potential mismatched relationships, and tendency to reinforce existing power structures [1]. The developmental network framework, which redefines mentoring as a network of people that provides support, has laid the theoretical groundwork for collective mentoring models: rather than relying on a single mentor to meet all developmental needs, individuals draw support from peers and senior figures across multiple domains [2]. This is especially relevant in graduate education, where students navigate complex academic, professional, and personal transitions simultaneously.

Mentoring circles have been shown to be a distinct and innovative mentoring model in higher education [2,3]. Mentoring circles are typically structured as small groups of participants who meet regularly to share experiences, exchange knowledge, and collaboratively address challenges. Unlike dyadic mentoring, mentoring circles emphasize collective learning and shared responsibility for mentoring outcomes. Researchers have argued that mentoring circles challenge the "heroic mentor" narrative by distributing mentoring labor across participants [3]. Their findings showed that mentoring circles can foster belonging, professional identity development, and self-analysis, particularly for early-career academics and graduate

students. Additionally, mentoring circles can address institutional constraints such as faculty workload pressures and uneven access to mentors.

Peer mentoring plays a central role within mentoring circles, particularly in graduate and postdoctoral contexts. In the context of peer mentor circles designed to support international graduate students, studies have identified benefits such as reduced isolation, increased cultural navigation skills, and enhanced academic confidence [4]. Peer-based circles allowed participants to normalize shared struggles and co-construct strategies for success within unfamiliar academic systems and mentors to act as accessible role models, helping demystify academic and non-academic career pathways. A study of mentoring circles for postdoctoral scholars at Brigham and Women's Hospital found positive outcomes related to career planning, networking, and work-life integration [5] – [7]. Mentoring Circles have also been used in preparing undergraduate students for graduate school [8] - [11] and in preparing graduate students and postdocs for faculty careers [12]. Algorithmic tools have even been developed in order to streamline the matching process for mentoring circles [13], allowing for mentoring circle scalability and growth.

These findings align with reports from the National Academies of Sciences, Engineering, and Medicine and the World Economic Forum, which emphasize intentional, inclusive mentorship and skills such as collaboration, adaptability, emotional intelligence, and lifelong learning as critical for workforce readiness [14],[15]. Collective mentoring models, such as mentoring circles, address mentor overload while expanding access to diverse perspectives and relationship-centered learning that supports these skills. Despite growing interest, research on mentoring circles among graduate engineering students remains limited, with existing studies relying largely on qualitative or self-reported data and offering limited generalizability. Moreover, traditional career exploration structures often lack the depth and sustained connection needed for informed career decision-making, positioning this Work in Progress as a promising framework for enhancing community and career readiness.

Methods

How GradBridge mentoring circles work as a unique partnership between two universities: Purdue University and the University of Berkeley are two large R1 land grant universities. To develop GradBridge, university partners met every other week for 6 months to develop program goals, website, branding, application surveys, eligibility criteria, curriculum, recruitment plans, mentoring matching criteria, resource development, run of show, and more. The Mentoring Circle structure has been studied and well-defined [5] - [13], and therefore was used as a framework for this pilot program.

Program Design: The GradBridge program design is centered around intentional structures in terms of modality, meeting timing, meeting flow, the frequency of meetings, and the structure of mentoring units. For example, the two partner institutions are in two different time zones (Pacific and Eastern time zones). To accommodate schedules, we set a fixed meeting time from the start: GradBridge meets every Tuesday in February from 7:00 - 8:30pm Eastern/4:00 - 5:30pm Pacific. GradBridge meets on Zoom, allowing increased access and flexibility for mentors and mentees and transparent expectations for meeting times.

The 1.5-hour meeting flow is established: meetings begin with a short PowerPoint with welcome and expectations followed by a group discussion to level-set on a given topic. The majority of the meeting is spent in Zoom breakout rooms, where mentors and mentees go more in depth on a given topic. Curriculum and sample questions are shared to increase conversation and flow. Finally, the meeting wraps with all mentors and mentees returning to the main Zoom room for dismissal.

The goal of the program is integral to the program's design: connecting graduate students and postdocs with experienced mentors, peers, and career insights. The interactive mentoring circles focus on career

exploration and professional growth. Therefore, the GradBridge program design helps participants navigate different career paths in engineering. Mentoring Circles are structured with two mentors and on average 8 mentees. There is intentionality to engage mentors who are professionals with a MS and/or PhD from a variety of careers, including Academia, Industry, National Laboratories and Government Research, Startups and Entrepreneurship, Nonprofit and NGO Sector, Consulting, Science & Technology Policy, Intellectual Property and Law, Finance and Investment and Communications, Writing, and Media.

GradBridge Curriculum: The Curriculum for GradBridge includes one kickoff meeting and three mentoring meetings. The first 20 minutes of the optional kickoff meeting focuses on sharing program expectations, structure, and goals. The group discussion topic is on elevator pitches followed by mentoring circle discussions in Zoom breakout rooms. Questions are shared with mentors and mentees and they discuss how they want to communicate over the length of the program and foster connections.

The first GradBridge meeting focus is on “Welcome and Expectations” with a discussion about mentee goals, including what they are looking to accomplish in mentoring circles and goals for their careers. Mentors share more about their specific positions, including day to day operations in addition to topics such as work-life balance (how it differs from grad school to workforce), competencies that mentors use from graduate school, financial discussions (what to do with all the money that you make; who do you ask, how do you plan for this), navigating pivots between fields, careers and sectors, career advancement and promotions (how to lift while you climb), managing others, and any politics of their job.

The second GradBridge meeting focus is on “Demystifying Sectors and How to Transition” with a short group presentation discussing *Maximizing your use of LinkedIn*. This is paired with spotlight profiles of GradBridge mentors to further share sector journeys. In mentoring circles, mentors give an overview about the hiring process (budget, approval process, phone and in person interviews), resumes and CVs, leveraging your network in the job hunt, and transitioning, including off-boarding from graduate school and on-boarding to their workforce sector.

The third GradBridge meeting focus is on “Reflection: Preparing and Lessons Learned” and includes a short group presentation on existing structures and resources for graduate students and postdocs and a celebration of the end of the program. Mentoring circles discussion highlights mentor reflections of things they wished they had learned in their graduate studies to help prepare them for their current role (project management, communication, technical competencies, soft skills, etc). Additional topics include exit strategies, debriefing on goals and next steps, and open questions.

Recruitment of mentors and mentees: Mentees consisted of Master’s, PhD Students, and Postdocs at Purdue and UC Berkeley. These students were emailed directly on university listservs and information was shared on LinkedIn for mentees by program administrators. Mentors consisted of any professional with a MS and/or PhD in Engineering (or similar STEM field). Since mentors did not need to be affiliated with either partner University, there was a comprehensive, high touch campaign to connect with potential mentors, including emails, collaboration with alumni groups, LinkedIn posts, and direct LinkedIn messages (over 100 direct messages sent). Emails were shared with faculty at each institution, administrative contacts on each campus, as well as discipline specific advisory boards. Since program administrators also recruit at large national conventions for their own graduate programs (SWE, SHPE, NSBE, AISES, oSTEM), flyers with QR codes were shared to engage with companies, professionals and alumni who might have graduate degrees and be interested in serving as a mentor.

Results

After a rigorous promotional campaign, the number of applications and overall excitement by prospective participants exceeded administrators’ expectations.

Mentor Applications: There were a total of 70 mentor applications submitted by the deadline. Four of those applicants were current Ph.D. students who had work experience and had completed their Master's degree, and therefore were encouraged to apply to the program as a mentee, resulting in a total of 66 mentor applications. In terms of gender of mentor applicants, 31 applicants identified as Male (47%) and 35 applicants identified as Female (53%). In terms of university that mentors listed as their graduate alma mater, 46 mentors (70% of mentor applicants) were from the two organizing universities (43% from Purdue Engineering; 26% from Berkeley Engineering) with 30% of mentors coming from other universities across the country. These universities included Brandeis University, California Institute of Technology, Duke University, MIT, Stanford University, Texas A&M University, the College of William & Mary, and others. There were 43 mentor applicants (65%) who had obtained a Doctoral degree (Ph.D. DEng, etc...) and 23 mentor applicants (35%) who had obtained a Master's degree.

Mentor applicants were from a variety of engineering disciplines, including some from non-technical spaces (HR) or from closely related STEM fields (Biology, Cognitive Psychology, etc.). Most mentors reported feeling comfortable mentoring in Industry, while others felt comfortable mentoring other sectors, such as Academia, National Labs, Startups and Consulting (Fig. 1).

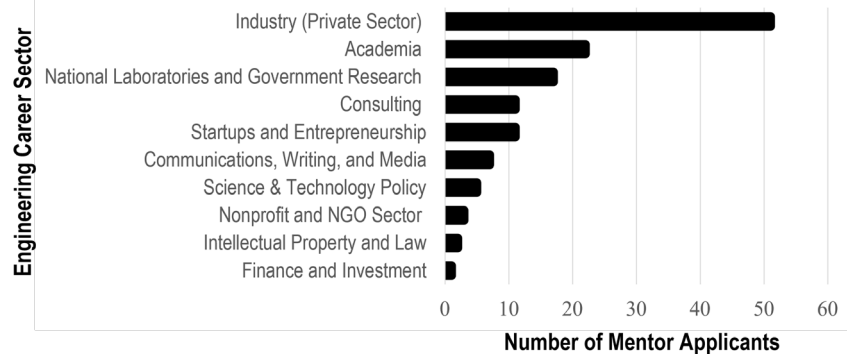


Figure 1. Sectors that mentor applications have experience and feel confident in mentoring. Mentors were invited to select all sectors that applied (n=66 mentors).

Mentee Applications: There were a total of 265 mentee applications submitted by the deadline. Since the deadline for the program was the beginning of January, the mentee application was left open for one additional week, resulting in a total of 307 applications. Two applicants were students from other institutions, and were therefore ineligible for participation in the program. Mentee applicants identified as 59% Male and 41% Female. Fifty five percent of mentee applicants are pursuing a Doctoral degree (Ph.D. DEng, etc...) (170 mentees), 41% pursuing a Master's Degree (126 mentees total; 103 Professional Master's and 23 Thesis Master's), and 3.5% completing postdoctoral studies (11 mentees).

Based on the current graduate enrollment of Purdue Engineering and Berkeley Engineering, each university saw about 3% of their total engineering graduate population apply to GradBridge, including 195 of mentees from Purdue and 110 mentees from Berkeley. Mentee applicants ranged from a variety of engineering disciplines, and the majority expressed interest in mentoring for Industry, while others expressed wanting to learn more about careers in academia, startups, entrepreneurship, and national labs (Fig. 2).

Conclusion

Mentoring circle programs, particularly those focused on graduate student career development for non-traditional careers, are becoming increasingly common across universities, including

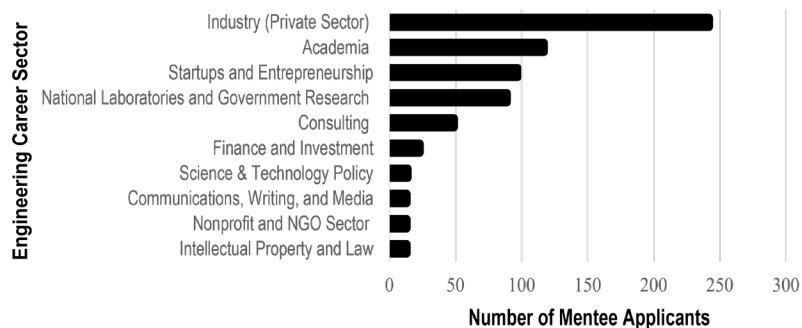


Figure 2. Sectors that mentee applicants are interested in learning more about. Mentees were invited to choose up to two areas (n=307 mentee applicants).

initiatives such as MIT's Graduate Student Mentoring Circles, Purdue University's EACC program, Brown University's Mentor Circles Program, among others. Together, these outcomes underscore the value of cross-institutional mentoring circles as a scalable and impactful model for supporting graduate student career development. GradBridge is unique from other mentoring circle programs due to its large size, online format, dedicated meeting time, and focused curriculum on graduate careers.

For GradBridge, administrators acknowledged that the primary limiting factor to scaling this program would be 1) the number of mentors who signed up and 2) the size of our Zoom room (300 participants). With this new program, we did not know how many mentors would volunteer, and after a rigorous marketing campaign, we were overwhelmed by the positive mentor response. With the growing number of mentor sign-ups came uncertainty about whether graduate student interest would mirror that enthusiasm. The concern proved unnecessary, as students signed up with enthusiasm, albeit the deadline was extended by one week. Mentors were motivated by a desire to give back, with many noting they wished such a program had existed when they were in graduate school. Several mentors were unable to participate, but wanted to contribute in future cohorts.

Some challenges emerged as the program design took shape. Time zones proved to be a significant factor: Purdue University is located on eastern time, UC Berkeley on pacific time, and mentors were distributed across the country—and even overseas. Identifying meeting times that worked for most participants became a central goal. Although dates and times were communicated from the outset, scheduling still posed difficulties for some. On the East Coast, conflicts often involved parents managing young children's bedtime routines, while on the West Coast, work related afternoon meetings and classes around 5pm were the primary constraints. Another challenge that emerged was the timing of the program. Mentee recruitment took place in December when students were focused on final exams (either taking or administering them), wrapping up the semester, and preparing for winter break. Purdue saw a strong student response early on, while Berkeley experienced greater interest after the New Year. Extending the application deadline proved beneficial for Berkeley, as 60% of applicants submitted their applications after January 1, 2026. Another interesting challenge was the suspected use of AI in mentee application essays, with even personal question responses appearing very similar across the 307 mentee applicants.

Through application data, we identified that there were some unique mentee perspectives, where non-traditional students were excited to share their previous work experiences with their mentoring circle. This supports the model of multiple modalities of mentoring in circles: peer mentoring and by specific mentors. Application data also suggested that mentees were driven to apply to GradBridge based on their goals of exploring career paths and clarifying goals, strengthening professional skills (networking and communication) and preparing for the next step in the job search process. Future studies of the GradBridge program should evaluate if students felt like they gained the appropriate exposure to a given sector and whether the GradBridge program was effective in helping participants meet their career goals. As the program continues in future years, a longitudinal study should also assess the impact of the GradBridge program in connection to participant's career outcomes.

In summary, the cross-institutional mentoring circles program was very well received and beneficial for students at both universities. The collaboration highlighted the value of working together to address graduate workforce needs, communicating information early and often, and securing support from senior leadership—including associate deans, department heads, chairs, and faculty—to amplify outreach and emphasize the importance of career development for graduate students. Industry was the top sector requested for mentoring for MS and Ph.D. students, and every sector was selected as being of interest to at least one student, highlighting the value of this cross-sector and cross-institution mentoring circle paradigm. Mentor participation was strong, driven by a desire to give back, and was matched by equally strong student interest in learning about career pathways from professionals in the field.

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