Finish my Research! Find a Job! Feel Better! Seminars to Support Engineering Graduate Students’ Professional and Personal Goals

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Introduction

Graduate students face a range of challenges beyond simply passing their courses and completing their research. Many graduate students struggle to access academic resources, integrate with their departmental and campus communities, and balance their personal responsibilities with their academic pursuits. Researchers have been studying the experience of graduate students for decades, looking at the role of social supports and the varied experiences of different populations of graduate students.

Providing adequate support for graduate students is important to ensure both their personal and professional success as individuals, and their ability to succeed after graduation in research, academic, and industry careers. Specific areas where graduate students often need support include: building community inside and outside their home departments, understanding and accessing campus resources, and planning for careers. While graduate students need to develop academic and professional skills in order to complete their coursework and research, it is also essential to develop “soft skills,” such as interpersonal communications, conflict resolution, time management, and team work.

This paper describes a multi-year effort to develop professional development activities for Engineering graduate students at Michigan State University (MSU). MSU offers Masters and PhD degrees in nine areas of Engineering and enrolls nearly 900 Engineering graduate students, of whom about 70% are international citizens and 25% are women. Among domestic graduate students, 18% come from populations historically underrepresented in STEM (science, technology, engineering, math).

Foundations for Graduate Student Professional Development

The MSU Graduate School has been a pioneer in professional development activities for graduate students, including NSF-funded initiatives for developing future faculty members; substantial investments in graduate student health and wellness; and growing services for students pursuing non-academic career pathways. MSU’s Graduate School has developed and evaluated these curricula and materials over a number of years, and offers regular workshops and activities for students from across campus. Recent examples include a seminar series on the responsible conduct of research; workshops on interpersonal communication skills, conflict resolution and time management; free chair massage and yoga classes for graduate students; and workshops on job searches in academia and industry. Overall, MSU has embraced a holistic
approach to graduate student support, with activities designed to serve more than 10,000 graduate and professional students, pursuing programs from Anthropology to Zoology, and encompassing a broad range of backgrounds and goals: research-based and professional degrees; academic and industrial career aspirations; non-traditional and online programs.

In addition to these University programs, the departments within our College of Engineering have long offered their own professional development activities for graduate students. Most departments host a formal orientation for new graduate students, and some departments continued this enculturation process throughout the year. For example, some departments require new graduate students to attend seminars to learn about ongoing faculty research, while other programs require new graduate students to enroll in courses focusing on research skills for their discipline. Several formal and informal graduate student groups also exist within the various departments, ranging from graduate student advisory groups to intramural sports teams.

**Pilot Efforts within the College of Engineering**

With nearly 900 graduate students across nine disciplines, the College of Engineering at MSU is well known for interdisciplinary collaborations and innovative research. Yet, many graduate students were unaware of the resources available within the College and had few opportunities to interact with Engineering students outside their home disciplines or departments. In an effort to address this gap, the College of Engineering implemented a formal orientation program for new graduate students in late August, right before the beginning of Fall semester classes. Various content was included in the College-wide orientation over the years, including presentations about accessing computer and information technology resources; using the MSU libraries; information on College and University policies for graduate students; building safety and evacuation procedures; introductions of representatives from the graduate student employee union; and in recent years initial training in the responsible conduct of research.

In the 2012-13 academic year, the College of Engineering at MSU made significant changes to the orientation program for new graduate students. **The primary goal was to reduce the content of the pre-semester orientation program to a few essential tools that new students needed in order to start their graduate studies successfully:** an introduction to key College personnel; overview of basic College websites and resources, including information technology; safety and evacuation procedures; and an introduction to the Responsible Conduct of Research (RCR), which is training required for all graduate students. In addition, the College added a presentation on building graduate community and finding support for personal and professional success. Brief ice breakers and community-building activities, such as intramural sports sign-up, were also added to the College orientation to help students begin to connect with each other.

While the revised Orientation for new graduate students provided just-in-time information to help students get settled in their first weeks at MSU, there was a great deal of additional content that the College wanted to introduce to its graduate students. Thus, a series of lunchtime seminars was instituted in Fall 2012. These lunches were targeted primarily at first-year graduate students, although any interested student was welcome to attend. In addition to pizza and soda, these seminars provided students with brief (~30 minute) introductions to various University resources, including the MSU Office of International Students and Scholars;
the MSU Graduate School; the MSU Libraries; and The Center for Engineering Career Services. Attendance at these seminars grew steadily from 35 to more than 100 students.

Originally, we had planned the lunchtime seminars to provide an “extended orientation” for new graduate students during the fall semester. However, informal feedback from new and returning graduate students indicated that there was strong interest in continuing to meet in the following semester. Thus, during Spring 2013, all graduate students were invited to bi-monthly seminars. Presentation topics were selected based on student interest, and included research skills (library resources, computational tools, data management); career development (resumes/CVs, negotiating job offers, industry and academic career pathways); and personal health and wellness (stress reduction, nutrition, guided meditation). We also began to track attendance at these events, and by the end of the semester had recorded 596 total participants across eight lunchtime seminars.

During 2012-13, we also piloted lunchtime gatherings for graduate women in Engineering, with the goal of creating a welcoming and supportive community for this population of students (women make up approximately 25% of our graduate student enrollment). During the fall semester, these monthly gatherings were informal discussions; during the spring students suggested topics and we engaged speakers on topics like the history of women at MSU, stress management, and nutrition. Over the course of the academic year, 193 students participated in eight gatherings for Engineering graduate women.

During the summer months, we implemented a suggestion from students to sponsor “Grad Lab Tours” that gave the opportunity for graduate students to visit some of the more interesting laboratory spaces on campus and learn about the Engineering research taking place there. The goal of these tours was to encourage graduate students to learn about Engineering research outside their own areas of expertise, and begin to cultivate professional and personal connections across the College. Seventy-five total students participated in the 4 tours hosted during Summer 2013.

Overall, the professional development activities we piloted during the 2012-13 academic year reached at least 302 unique individuals, with a total of 931 participants. (Actual participation totals were higher, as we did not begin tracking attendance consistently until the spring.) Through informal conversations, students indicated that they found the professional development activities valuable and they offered suggestions on where to focus our efforts the following year.

**Refining Professional Development Activities**

After testing various graduate student activities during the 2012-13 academic year, we developed a plan for Fall 2013 that focused on three primary goals:

1. Supporting students’ success in academics and research
2. Supporting students’ success in personal health and well-being
3. Supporting students’ success in preparing for careers
During the fall semester, activities that introduced resources for **success in academics and research** were targeted primarily at first-year graduate students. During an initial orientation in late August, new graduate students were invited to attend monthly lunches during the fall semester as part of a “continuing orientation” to University resources for academic and research success. While continuing graduate students were not prevented from participating in these lunches, many of our current students had participated in similar seminars during 2012-13 and thus already knew about these resources.

Several activities during Fall 2013 focused on students’ **health and wellness**. Graduate women were invited to monthly lunches that fostered a supportive community and encouraged participants to suggest topics for the group to discuss – presentations during the fall semester include work-life balance and career pathways for women in Engineering. Monthly coffee gatherings for all graduate students also focused on health and wellness topics, including stress management and productivity.

Students also had the opportunity to explore **career options** during Fall 2013. Students interested in academic or teaching careers were invited to participate in a monthly lunch seminar, while monthly coffee gatherings focused on resources for non-academic career pathways. Table 1 summarizes the professional development activities we implemented during the fall semester.

### Table 1: Summary of Fall 2013 Professional Development

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<th>Audience</th>
<th>Number and Format</th>
<th>Total Participants</th>
<th>Topics Presented</th>
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| New Graduate Students     | 3 monthly lunch seminars | 140                | • Data management for research  
• High performance computing resources  
• Library resources |
| Graduate Women            | 3 monthly lunch seminars | 81                 | • Work-life balance  
• Careers in Engineering |
| Students interested in teaching | 3 monthly lunch seminars | 113                | • Overview of certification in college teaching  
• Introduction to Engineering Education research  
• Effective mentoring of undergraduate researchers |
| All Students              | 7 bi-weekly coffees  | 140                | **Career Preparation**  
• Building professional resumes  
• Career success tools for grad students  
• LinkedIn and social media  

**Health & Wellness**  
• Stress management  
• Productivity  
• Faculty-student mixers (2) |
Evaluation

Students were asked to sign in for each activity during Fall 2013, and typically 80% complied with the request. 321 unique students signed in at the professional development activities described in the previous section (total participation across all activities was 620). In order to gauge whether the activities we developed were valuable to students, we distributed anonymous feedback forms at most of the professional development activities during Fall 2013. Students were asked to respond to four statements using a 5-point Likert response scale (5=Strongly Agree, 4=Agree, 3=Undecided, 2=Disagree, 1=Strongly Disagree):

- I was interested in the topic of this seminar.
- This seminar provided valuable information.
- The presenter was engaging and enthusiastic.
- This seminar should be included next year.

In addition, three open-ended questions asked students about the most and least valuable components of the seminar, and if they had other comments or suggestions. Students’ responses were overwhelmingly positive – across all activities, the lowest average score for the four Likert questions was 4.5 (out of 5). Several students also suggested topics and raised questions for future seminars.

One significant challenge we encountered during the Fall 2013 activities was the timing of the coffees (which alternated between career-preparation and health/wellness topics). Based on prior year attendance, which averaged 80+ students, we needed to relocate to a larger room that had limited availability. Thus, the graduate student coffees were scheduled for 3pm on Fridays, which proved to be an inconvenient time for many students. While overall attendance for Fall 2013 was excellent, average attendance at the Friday afternoon coffees was just 17 – with a range from 2 participants to 35.

Discussion and Future Plans

Our efforts to increase professional development opportunities for graduate students within the College of Engineering has filled a gap between the discipline-specific training provided by our departments, and the broad resources provided by the Graduate School and Michigan State University. However, our seminars are limited in scope: while we can introduce students to resources and make them aware of opportunities, a one-hour lunch or coffee is not sufficient to cover topics in depth. Thus, we have purposely invited presenters from existing MSU professional development programs to come to Engineering and introduce our students to their areas of expertise – and invite students to participate in the full program if they are interested in learning more.

Anecdotally, we know that the Graduate School has noticed an increase in Engineering graduate students participating in some professional development opportunities at the University level, particularly in areas related to college teaching and preparation for academic careers. Moving
forward, we plan to continue working in collaboration with the Graduate School to encourage our Engineering students to take advantage of the broader resources available at the University. For Spring 2014, we continue to focus on three areas of development for our graduate student activities: academic and research support; health, wellness and community support; and career preparation. To support students’ academic success, we plan a series of seminars to prepare students for the Engineering Graduate Research Symposium. This annual event invites graduate students to present research posters and offers opportunities to interact with students, faculty, alumni and industry professionals from different Engineering disciplines. In the weeks prior to the Symposium, seminars are planned to help students understand the patent process; create effective research posters; and network effectively with alumni and industry representatives.

To support students’ wellness and community building, we will again leverage existing University resources in Spring 2014. Lunchtime seminars are planned, featuring topics such as financial planning, the MSU Family Resource Center, and work-life balance. In addition, grant funding was obtained to support a six-session facilitated book discussion series for graduate women, focusing on “Lean In” by Sheryl Sandberg.

In addition to preparing students to network effectively at the Symposium, our career preparation efforts will include additional seminars on topics related to academic careers and teaching practices, such as providing effective feedback for students; developing a teaching portfolio; and the academic job search. Throughout Spring 2014, we will continue to request feedback from students in order to refine our ongoing efforts to support students’ academic, personal and professional success.

References


