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for Mathematical Innovation and Discovery

Mentoring for
Engineering Academia II:

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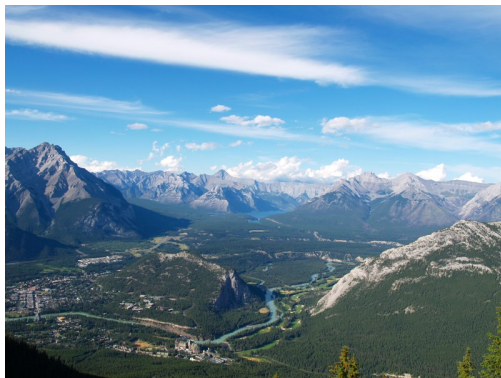
Preface

In June 2004 a workshop was held at Stanford University on the subject of mentoring for academic careers in engineering. For two days (20–22 June) the workshop provided a forum on the needs, goals, methods, and best practices for mentoring engineering students interested in an academic career, young faculty beginning such a career, and recently tenured faculty. The emphasis was on mentoring members of underrepresented groups in academic engineering, especially women. The workshop was jointly supported by a Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring (PAESMEM) through the National Science Foundation, and by the School of Engineering at Stanford University attendees. Workshop funding was largely devoted to providing local housing and sustenance for workshop. Participation was by invitation and application. There were no registration or other fees. Participants included experienced mentors along with recent graduates and students who were considering, had decided upon, or had begun academic careers. Faculty in leadership positions were invited along with those emphasizing research and teaching. The workshop consisted of invited presentations, proposed presentations by participants that were accepted by the Organizing Committee, panel discussions, and informal discussions. There was an admitted bias towards EE/CS because of the constitution of the Organizing/Program Committee and the initial group of people involved, but all engineering disciplines were welcomed along with other related disciplines where there was interest.

The workshop had two primary goals. The obvious one was to provide an opportunity for mentors, mentees, and mentoring facilitators to educate each other and have fun doing so. The second goal was a deliverable: to produce proceedings of the workshop, including summaries of the talks and discussions. The slides of the

talks and the proceedings were made available at the workshop web site <http://paesmem.stanford.edu/> and several hundred copies of the proceedings were printed and distributed among the participants and others who requested them.

In July 2005 I was attending a workshop on Multimedia and Mathematics at the Banff International Research Station (BIRS) in Alberta, Canada, which had been organized by Rabab Ward of the University of British Columbia and me. We were encouraged to consider future proposals for BIRS workshops of



interest to mathematically inclined engineers, and strong interest was expressed by the BIRS management in our suggestion of a follow-up workshop on mentoring for engineering academia. The group of co-organizers was expanded to include Professors Eve Riskin of the University of Washington and Sheila Hemami of Cornell University. A formal proposal was submitted, and a five-day workshop was awarded for 22–27 July 2007.



Why workshops? Workshops bring together a much more varied and diverse group than one is likely to meet under ordinary conditions. Bringing undergraduate and graduate students together with faculty of all levels, from assistant professors to presidents of colleges and professional organizations, can be

an incredible learning experience in both directions, from experi-

enced mentors to beginning students, and from students and junior faculty to their senior colleagues. The variety of ideas and experience brought to such workshops stimulates fascinating discussions of traditional and unexpected topics, along with a rich collection of personal stories that exhibit the richness of academic careers. The percentages of demographic groups can be purposefully altered to let traditional majorities and minorities change roles and experience the resulting dynamics in presentations and discussions. Several days of intense interactions with lots of time for discussions, hikes, strolls, and reflection can stimulate and motivate participants, as well as provide new professional connections and an interdisciplinary network among mentors, protégés, colleagues, and friends. Set all of this in one of the most beautiful national parks in the world, and it results in a workshop that is productive and more fun than many vacations.



Acknowledgements

Special thanks to the Banff International Research Center for supporting this workshop. In particular, we would like to thank the Scientific Director Professor Nassif Ghoussoub, the Facilitator Andrea Lundquist, the Station Manager Brenda Shakotko for all of their help in organizing the workshop and its logistics. Thanks to the par-

ticipants who contributed photos of the sessions and activities: Pam Cosman, Misty Davies, Min Wu, Maria Klawe, Christine McKay, Luciana Ferrer, Jia Li, Tracey Ho and Veronica Wadey.

Robert M. Gray
Co-organizer and Editor

Chapter 1

Introduction

The percentage of women holding academic positions in most branches of engineering and related fields in mathematics and science is far below their representation in the overall population. Often a department of 60-70 professors will have only one or two women, and often there are none in smaller departments. While the numbers and the environment have improved in many professions, such as biology and law, during the past century, with a few exceptions engineering has remained well behind in the gender and ethnic diversity of its faculty and academic administration. The situation is even worse for underrepresented minorities. This lack of diversity means that the available pool for both academic and nonacademic jobs in high technology areas important to industry and government is significantly lower than it should and could be. The problem tends to propagate itself because the number of role models and mentors able to help new generations of students is limited. While increasingly government and academia have encouraged diversity, the results have, unfortunately, often amounted to little more than lip service with little demonstrable improvement in the actual numbers. There is also sometimes a backlash to efforts to increase diversity: search committees for engineering faculty might not buy into the goal of diversifying the pool and female candidates who do make it to campus for an interview are met with suspicion — the assumption is that the invitation is based on pressure rather than qualifications. A familiar litany of excuses has often been put forward to explain the failure of institutions to make genuine progress, including public statements by officials that reinforce the myths regarding the effects of gender

and ethnicity on mathematical and technical abilities. Happily some institutions have made progress, and even small numbers of sympathetic faculty and administrators have made a notable impact on the recruiting, hiring, mentoring, and advancing of women and underrepresented minorities in engineering faculties; these few have in turn had an impact on the larger student population. The reasons and catalysts for such successful changes are not generally known and are often highly specific to the institutions and people involved. Furthermore, many of the problems have stubbornly resisted solution. However, the pooling of experience and ideas can contribute to their eventual resolution.

During 22–27 July

2007 a workshop was held at the Banff International Research Station (BIRS) in Alberta, Canada, to bring together students, faculty, and representatives of academic administration to collect, invent, discuss, develop and document ideas on how individuals and groups within academic environments can effectively promote awareness and progress regarding underrepresented groups in their institutions in general, and among their students and colleagues in particular.



The workshop was loosely modeled on the successful workshop “Mentoring for Engineering Academia,” held in June 2004 at Stanford University with the support of a Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring (PAESMEM) — a program sponsored by the White House and administered by the US National Science Foundation — and the Stanford University School of Engineering. That workshop brought together 70 students, faculty and administrators for presentations, panels, and discussions on mentoring graduate students and both junior and mid-career faculty and provided an enthusiastic and stimulating exchange of ideas. Proceedings were produced in both a Web format — available along with the

presentation slides at <http://paesmem.stanford.edu/> — and a paperback book, which was distributed to participants and more widely through the US NSF and by request (copies are available while they last from rmgray@stanford.edu).

The BIRS workshop was envisioned as a followup to the original PAESMEM/ Stanford workshop and had an organizing committee with a strong overlap with the original workshop. However, the structure, specific topics treated, and location changed. Topics treated in the original workshop and revisited at BIRS included the following:

- Fundamentals of mentoring for engineering academia
 - Graduate students
 - Junior faculty
 - Post-tenure faculty
- Mentoring for academic leadership
- Faculty and Family: Strategies for time-sharing profession and parenting

New topics considered at the BIRS workshop included

- mentoring for undergraduate students and for non-tenure track faculty (both demographics were represented in the participants)
- Promoting fairness and openness in search committees
- Measuring sustainable progress for women in academia
- Outreach
- Building a mentoring system from the ground up: a one-stop shopping guide for deans/chairs to put things in place.

Each of these topics became the focus of a session at the workshop and forms a chapter in these proceedings.

The BIRS workshop shared the two primary goals of the earlier workshop:

1. helping the participants be more effective both locally and globally in improving the environment and diversity of faculty in engineering and related disciplines, and

2. producing a book distilling the ideas generated at the workshop that will be useful to colleagues as well as to review panels and visiting committees charged with evaluating institutional progress and recommending potential improvements.

The relevance and importance of this initiative are amply illustrated by the pressing national need for trained technical talent and the implicit need for enlarging the pool of trained, talented members of the profession. The issues will remain timely until the population in the engineering professions better reflects the population in general, as has happened in biology and law.

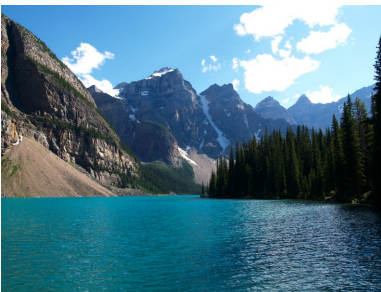
The primary objective of the workshop was the development and documentation of ideas on how to mentor students, colleagues, and academic administrators on issues relating to academic careers in engineering and related disciplines, with an emphasis on issues relating to women faculty in electrical engineering and computer science. Many forms of mentoring were considered, including

- mentoring of students on pursuing a successful academic career involving teaching, research, and leadership
- mentoring academic colleagues on
 1. seeking genuinely open and fair searches that actively seek and recruit a wide diversity of applicants
 2. working for a supportive and cooperative environment in which junior faculty can thrive and advance
 3. helping recently tenured mid-career faculty plan the next stages of their career, and
 4. encouraging and assisting junior and mid-career faculty to consider roles in academic administration
- mentoring academic administrators on providing adequate support for individual students and student organizations
- two-way mentoring, explicitly encouraging senior faculty to incorporate feedback from their protégés regarding the effectiveness of their mentoring skills and the accuracy of their perception of their protégés environment.

Most sessions began with brief presentations followed by discussion, a break, and more discussion. These proceedings represent a distillation of the presentations, the slides used by presenters, notes taken by scribes, and audio recordings of the sessions. The editors comprise the workshop organizers along with others who assumed responsibility for drafting the chapters for each topic. The proceedings were produced by iteratively revising the original draft using comments, corrections, and suggestions from the presenters and other participants.



Following the workshop, two student participants — Lydia Contreras and Jamie Walls — put together a survey as a means of gathering feedback from the participants in order to formally evaluate the impact of the workshop upon them. As part of their preparation of the survey, Lydia interviewed me as organizer, and we include that interview as a study on how the workshop was organized and run. The chapter provides interesting hindsight on the workshop itself that should be of interest both to the participants and to those considering organizing their own events.



Chapter 2

Fundamentals of Mentoring for Engineering Academia

Panel

Suzanne G. Brainard (Chair)	Affiliate Professor, Engineering & Women's Studies Executive Director, Center for Workforce Development University of Washington
Richard Ladner	Professor, Computer Science University of Washington
Yolanda S. George	Deputy Director, Education & Human Resources American Association for the Advancement of Science
Eve Riskin	Associate Dean, College of Engineering Professor, Electrical Engineering University of Washington

Mentoring in academe is still a mysterious process and often thought to be intrinsic to those in the academic community. In general, faculty are not taught how to mentor undergraduate or graduate students or how to differentiate mentoring from advising. This chapter explores and discusses programs and practices that have had

demonstrated success with undergraduate students, graduate students and junior female faculty.

There is a large literature on the reasons for, benefits of, and mechanics of mentoring. This chapter focuses on several specific topics, specifically on mentoring students from underrepresented groups, students with disabilities, and junior female faculty in engineering and computer science. Further details and more general discussions may be found in the cited references and Websites.

2.1 Mentoring graduate students from underrepresented groups

Research from a variety of sources, including the American Association for the Advancement of Science (AAAS), the National Science Foundation (NSF), and the Alliances for Graduate Education and the Professoriate (AGEP), characterizes the impact of mentors on doctoral students from underrepresented groups.

An AGEP/NSF study by Nettles and Millett [20] (see also the Website <http://www.nsfagep.org/PRmeeting/agenda.htm>) on the experiences of science, technology, engineering, and mathematics (STEM) graduate students indicates that having a faculty member who is viewed by the graduate student as a mentor, not just a research adviser, can have positive influences on the research productivity of graduate students, rate of progress towards degree completion, degree completion, and the time to degree. In general, students with mentors appear to have more opportunities to

- present a poster or a paper at a conference
- publish a peer-reviewed journal article
- publish a chapter in an edited volume
- publish a book

A study by Chris Golde [9] argues that having a mentor, not just a research advisor, appears to facilitate integration into the graduate school intellectual community or laboratory. Other factors that appear to do so include

- planned orientations coupled with frequent communications and annual reviews of required milestones with faculty mentors
- planned peer mentoring
- shared office space with a more experience graduate student

The AAAS maintains a Website, <http://ehrweb.aaas.org/sciMentoring/>, that provides a wide variety of research and resources for STEM mentoring including a detailed report on mentoring [8], found at <http://ehrweb.aaas.org/sciMentoring/research.php>. The study provides a variety of advice for faculty mentors, we summarize here.

Faculty mentors should provide graduate students with the opportunities to

- write abstracts and participate in poster and paper presentations at professional society meetings.
- author or co-author peer-reviewed journal articles and book chapters.
- review journal articles or book chapters.

In addition, faculty mentors should ensure that graduate students can conduct literature searches, formulate research questions, and conduct statistical and computational analyses. Furthermore, graduate students should understand the following:

- the patent process
- intellectual property rights
- scientific ethics
- use of human subjects in research
- the institutional review process (IRB)
- best practices in teaching
- how to set up and manage a laboratory
- how to write a budget

Race/Ethnicity	7-Yr PhD Completion Rate in Engineering	10-Yr Completion Rate in Engineering
Native Americans	69.2%	66.7%
Black/African American	38.1%	50%
Hispanic	52.2%	67.5%
Asian American	45.7%	53.6%
Majority (White)	52.3%	62.5%

Table 2.1: Council on Graduate Schools Data on PhD Completion Rates and Timing by Race/Ethnicity and Timing in Engineering

- grant-writing procedures
- science policy
- how to develop international research collaborations.

STEM departments should assess their graduate student mentoring experiences, including

- appointing a departmental mentoring committee to develop and implement a departmental mentoring plan with a particular emphasis on providing students with career information and opportunities to develop workforce skills
- providing mentor training for faculty
- providing mentee training for students,
- providing online mentoring resources or links to resources for faculty and students, and
- assessing and providing incentives for high quality faculty mentoring.

Data from the Council on Graduate Schools (CGS) indicate that nationally the PhD completion rate in all fields appears to be about 57% . However, the data varies by fields and racial/ethnic group and time.

(See the presentation by Daniel Denecke at [http://www.nsfagep.org/PRmeeting/.](http://www.nsfagep.org/PRmeeting/))

Research indicates that planned and effective mentoring can help to increase PhD completion rates and improve the time to PhD. The National Science Foundation Alliance for Graduate Education and the Professoriate (AGEP) program believes that in order to improve the PhD completion rate and time to degree, certain interventions need to be implemented. STEM departments need to implement mentoring strategies and practices that facilitate progression towards the PhD, including

- academic preparation & support programs, particularly during the early course-taking years.
- ensuring that graduate students are on track towards the PhD, including nurturing during their preparation for qualifying and comprehensive exams
- early detection of switchers and leavers in the department
- early social and intellectual integration into the department
- faculty mentoring that focuses on research productivity, career counseling, and workforce preparation
- attention to financial aid and debt burden
- attention to family/work balance.

2.2 Mentoring undergraduate researchers

A personal story

Mentoring undergraduates for research is a relatively new phenomenon, one that has not yet received significant attention in the literature or workshops on mentoring. The motivations and methods are not well known, so by way of introduction it is useful to begin with the personal story of Professor Richard Ladner, who has been increasingly active in developing and sustaining undergraduate research programs at the University of Washington. Ladner grew up with deaf parents, and has long had a strong passion for working with undergraduates, which has continued through his career in theoretical computer science. His interest in research at the undergraduate level began with his first research experience as an undergraduate proposing and developing a problem under the supervision of a sympathetic faculty

member. He still recalls the frustration and struggle of trying many directions that did not succeed, and receiving guidance from his professor that was not always productive. Nonetheless he made progress and found a solution, and came to the realization that this was the nature of research. Later as a CS faculty member, he understood based on his own experience that many undergraduates are quite capable of learning research skills and performing research, and that for faculty mentors supervising such research, the rewards can be great. Unlike graduate students, research for undergraduates is not yet a “profession,” and greater risks can be taken in the selection of problems — the students will learn basic tools and skills and make some progress even if they do not finish with an elegant solution to a famous problem. Beginning with only one or two students a year within a small department, Ladner helped students find and work on a variety of problems that matched their interests. Initially problems grew out of his class projects and discussions with students and were often continued as part of a departmental senior honors program that required only a sufficient grade point average and a willing faculty mentor to begin, and a senior thesis to complete.

In time, Ladner helped develop and support a variety of formal programs for encouraging undergraduates to do research with a faculty member. These programs for the institutionalization of undergraduate research are described later in this chapter. His own interests coincided with the University of Washington’s own interest in promoting undergraduate research.



In the past eight years, Ladner has personally supervised over 40 undergraduate students. He has nominated several for the Computer Research Association (CRA) Outstanding Undergraduate Award, two of his students have won the Best Senior Thesis Award, and he has published papers in journals, conferences, and workshops with 20

of these students. Some of these students have gone on to graduate school, but most are working in industry. Some of these students are from other institutions: Cal Tech, University of Portland, and Norfolk State University. In some cases, he has worked with students for as little as three months, but with most it has been for a year or more.

...without qualification some of my most enjoyable moments as a faculty member have been in one-on-one research meetings with undergraduates ... Helping to provide them with their first research experience has been very satisfying.
Richard Ladner

Institutionalization of undergraduate research

The motivation for the University of Washington to promote undergraduate research lies in its desire to distinguish itself from other colleges and universities in order to attract the top high school students in the state, who might otherwise go elsewhere. The University wants to leverage its recognition as a great research university to attract and retain stronger undergraduates. In order for the University of Washington (UW) to place a priority on undergraduate research, it established the Undergraduate Research Program (URP) under the Dean of Undergraduate Education. This program sponsors over 200 undergraduate research scholarships per year through the Mary Gates Endowment for Students. Between \$ 3,000 to \$ 4,500 per year is given directly to the student. To receive a scholarship, a student must have a research project supervised by a faculty member. The student's application contains a letter of support from the faculty sponsor. Each quarter, the faculty member reports on the student's progress. Every year the URP has an undergraduate research symposium where hundreds of students present posters and give talks. URP sponsors workshops for faculty members who have an interest in working with undergraduates and workshops for students on how to get involved in research projects. Since the inception of the URP in 1997, the number of undergraduates involved in at least one quarter of research has increased from about 600 students to over 4,000 students annually. The Washington NASA Space Grant program is centered at the University of Washington. It sponsors more than 50

internships for undergraduates each summer. The program requires matching funds from a faculty member. The students in the Space Grant program form a cohort, where they not only work on separate research projects, but meet once a week to share with each other what they are doing and have career-building workshops.

The University is very supportive of applications for NSF Research Experiences for Undergraduates (REU) Sites and Supplements. There are currently three NSF REU Sites at UW, in Material Science, Chemistry, and Mathematics. Summer students in these programs can take advantage of career-building workshops sponsored by URP and the Career Center. Working at a university with strong support for undergraduate research has really helped Ladner's own efforts in this direction. Fifteen of his students have received Mary Gates Research Scholarships and three have received NASA Space Grant awards. The URP infrastructure that conducts career-building workshops and research symposia has helped his research students and complements what he does with them individually.

Faculty are encouraged to take full advantage of the NSF REU Supplement program, which is available to anyone who holds an NSF grant. A supplement can pay an undergraduate both in the summer and during the academic year. Eighteen of his students have received NSF REU supplement awards since 2000. The process of applying for a supplement is very easy, taking at most an hour. With all supplements, one should contact the grant program manager before applying. Program officers at NSF do not like to be surprised with a supplement request. The Computer Science and Engineering Department has to build up the infrastructure to support undergraduate research. The Department has an Undergraduate Research Seminar that started in 1999, where students give 50-minute talks on their research to their peers. Since 1999 more than 115 students have given talks in the seminar. Working with a student to prepare a talk is one of the best ways to cement a relationship. The department also has an Honors Program that requires a senior thesis and a talk, and gives the Best Senior Thesis Award each year. These kinds of activities encourage both students and faculty to engage in research together. On average, about 40 undergraduates in the department are signed up for some research credit each quarter.

Advice to Mentors

The goal of mentoring undergraduates in research is not to mold them in your image, but to give them a taste of research to help them decide what kind of future they will choose for themselves. As a byproduct, mentoring undergraduates can be helpful to a faculty member's research program.

Finding students

Often students approach a faculty member wanting to work on some project. The faculty member should request a transcript and resume, to help determine if the student is ready for a research project. If the student is ready and the faculty member not too busy, the faculty member could take the student on. When a faculty member does not have a project for a student and no one is in the queue, the faculty member could do an "open hire," that is, advertise and do interviews. Finally, when teaching a class, it is easy to find a student who did a terrific job in the class. In this case the faculty member could ask the student to work with him even though a specific project is yet to be determined. Sitting down with the student for an hour just to talk and to find out what he or she is interested in can help determine a project. Professor Ladner recalled one memorable student, who was a double major in computer science and music and a concert pianist. He created a project for her that involved the "analysis of music using data compression." Later two other double majors in computer science and music worked with me on "computer analysis of music." In many of these cases, the student will work on one project, then later find a better fit for the student on another project.

Choosing a project

It is extremely rare that a student has a research project in mind, so it is necessary to provide one, at least at the beginning. The trick is finding a research project that suits the student. With most students, the goal of the interview process is to find out what they are interested in and what he or she is capable of doing. It is best to try to fit the project to the student rather than the other way around. Students interested in theory might not want to do an implementation project, and students who like to code a lot do not usually

like to prove theorems. This is an oversimplification, because most students are more complex in their interests and abilities.

Working with students

Some students work on group projects, sometimes partially supervised by a graduate student or even a senior undergraduate. In these cases, students are invited to the weekly group meeting. With some of these students, an individual meeting is more appropriate if they are working on a specific problem where they need more time with the faculty member. Even those students who are working in a group are eventually given a piece of a project that they own, where they have full responsibility. In the beginning, the student might be told to do this or that, but as the student learns more about the project, he or she becomes ready to take a piece of it and run with it. There are other students who have their own individual projects, where the faculty member meets with each individual weekly. Usually a faculty member has time to give full attention to only two or three of these students. Some of these students later move into a group project, and some of them move from a group project to an individual one. Because these students are usually involved in their first research projects, it is important to remember that real research is by its nature frustrating. It is important to be careful not to be too critical, to set high standards but at the same time always be encouraging. Encouragement does not mean giving false or unwarranted praise. It means understanding the struggle to do something new, and encouraging the student to keep at it. Understand that lulls in productivity are common in research, but always expect the student to work hard. Give guidance and direction without completely taking over the project. When a student makes a breakthrough, writes a nice paper, or gives a good talk, then give them a pat on the back and nominate him or her for an award.

2.3 Mentoring-for-leadership roles for women faculty

Mentoring students and junior faculty for a role in academic leadership is critical for the future. Only effective leaders can guide a faculty to build and maintain high quality diverse programs. Mentoring

techniques specifically aimed at encouraging students and young faculty to consider leadership paths in their careers have been discussed in the literature, for example in [23]. At the University of Washington a major initiative towards this end has been the Mentoring-for-Leadership lunch, created in 2003 as part of a National Science Foundation ADVANCE Center for Institutional Change at the University of Washington. As described in more detail in [32], the lunch series was developed for women faculty in STEM (science, technology, engineering, and mathematics) fields to focus specifically on women leaders and to counter the negative impact that the scarcity of women leaders in STEM may have on female scientists' career aspirations. Each event features a different woman leader who discusses the benefits and challenges of holding an administrative job and shares her unique experiences on her path towards leadership. This program aims to encourage STEM women faculty to consider leadership and uses personal narratives to demonstrate to women faculty that there are many ways to become a leader in academia.

These lunches allow women faculty to gather informally for an hour and a half. Food is provided and for the first 20-30 minutes, participants eat and converse with one another. The speaker then briefly shares with the group both personal and professional experiences relevant to her career trajectory. Speakers



limit their remarks to 20 minutes to encourage time for discussion. Speakers typically reflect upon the challenges of finding a balance between work and life, research and leadership commitments; confronting and overcoming career obstacles; difficulties encountered in leadership positions; and the factors that contributed to their decision to pursue leadership positions. This discussion-based event concludes with a question and answer session, allowing participants to not only learn further from the speaker but from each other as well.

The leadership positions of the invited speakers are varied. Many

speakers are from a STEM background, although a variety of fields have been represented. Between May 2003 and December 2006, 44 women have spoken. During that time, 54.5% of the speakers were from the University of Washington and 45.5% were from other universities or national organizations. Sixty-five percent of the speakers have been at the associate dean level or higher. The ADVANCE Mentoring-for-Leadership lunch series offers women faculty in STEM, who are often few, the opportunity to network across units and to build a community of women scientists at the University of Washington. Past participants hail from over 30 STEM departments at UW and other universities. The lunches bring together women whom may not otherwise meet. Participants often note how rare it is to gather together in a group with other women science and engineering faculty. Speakers, too, have commented on the powerful effects of this critical mass. These events encourage multi-directional mentoring. Speakers have said that they appreciate the opportunity to reflect on their accomplishments and how their gender has had an impact on their career. A number of contributors, including both speakers and participants, have been promoted since taking part in the lunch series. By learning from other women what specific leadership positions entail and what strategies women employ to successfully navigate through the upper echelons of academia, women faculty can be inspired to become leaders themselves. A brief description of the program is located at <http://www.engr.washington.edu/advance/mentoring/index.html#leadership>. Another webpage with information about past speakers and email templates that can be used to facilitate establishing a similar program at other campuses is located at http://www.engr.washington.edu/advance/mentoring/leadership_lunch.html.



Chapter 3

Mentoring for Academic Leadership

Panel

Maria Klawe (Chair)	President, Harvey Mudd College
Leah Jamieson	John A. Edwardson Dean of Engineering Purdue University 2007 President and CEO, IEEE
Jeanne Ferrante	Associate Dean University of California, San Diego
Eve Riskin	Associate Dean University of Washington

Academic leadership has its joys and perils, but the rewards can far outweigh the penalties and current and future faculty should seriously consider leadership opportunities in their career path. This chapter considers the nature of leadership, as well as its obstacles, dangers, rewards, and tradeoffs along with a little advice. Examples of various paths to leadership are described.

3.1 What is leadership?

There are many flavors of leadership for academics. Perhaps the most familiar are the well known positions in academic administration, including the positions of department chair or head, deans, provost, and president, along with variations of these positions with qualifiers

like associate, assistant, and vice. But leadership is not restricted to administration; other leadership positions within academia include leading research groups, from lead researcher on small teams to directors of programs and centers. Professional societies offer a variety of leadership positions, including boards of governors and executive officers. Some academics become leaders in government agencies and entrepreneurial startup companies. The various skills for these varied of positions are not the same, but they are often complementary and transfer directly. Paths to top leadership positions can take a variety of forms, as indicated by the examples given in this chapter.

3.2 Rewards of leadership

The greatest reward of leadership is the ability to have a major impact on an institution and its faculty in an area you care about. Leadership brings with it access to greater resources and leverage and the tools for making your world a better place for you and your colleagues.



Such change can result in significant improvements when brought about by those who care deeply about their academic environment and are willing to expend the effort necessary to make improvements. Being able to promote and implement significant changes through curriculum reform, advancing new technologies, fostering new multidisciplinary collaborations, and expanding the focus of an institution can be exhilarating and fulfilling. Creating new programs such as the Engineering Projects in Community Service (EPICS) [14], developed at Purdue University to combine engineering education, real-world projects, and community service, can benefit a far larger community than academics usually reach. Having an influence on the fu-

ture directions of academic and professional institutions by leading strategic planning can have a major positive impact on education and the profession, and some academics participate in national and international planning of major projects with potential benefits for large populations.

Taking on leadership responsibilities brings with it new kinds of learning, including the development of skills in negotiation, communication, collaboration, grant writing, mentoring, time and project management, finance, performance evaluation and people management. These skills in turn can improve our abilities as researchers and enhance our contributions to professional organizations and society. Acquiring such new knowledge and putting it into immediate practice with visible benefits can be highly satisfying.

There are often unexpected rewards, such as the joy and pride of celebrating others' successes and the pleasure in seeing yourself stretch to solve unexpected problems. (A good time to consider becoming a leader is when you are ready to celebrate the accomplishments of other people as much as you are your own.) Even the chores of fundraising can lead to unexpected pleasures when meeting alumni with amazing careers and accomplishments.

Finally, there is the perk that higher leadership brings with it increased opportunities for travel and meeting new people.

3.3 Dangers of leadership

The final reward of leadership listed above can also be a danger if there are *too many* opportunities for “free” lunches with people not of your choosing. But there are far more serious issues.

Many academics are reluctant to take on leadership responsibilities because they see such responsibilities as a negative career move: time devoted to such service will take away time from research and students, usually the primary concerns of faculty. The paths to leadership are rarely clear and typical graduate education provides little training specifically useful to managing and leading organizations. Assuming leadership responsibilities, therefore, usually involves a steep learning curve. Women and underrepresented minorities often perceive these barriers as being greater than their male colleagues do, as they are often less confident than men about the degree to which they possess the necessary skills. For example, *Women Don't Ask: Nego-*

tiation and the Gender Divide [2] documents the gender differences in confidence in the knowledge of negotiation and in the possession of negotiation skills. Experienced mentors are familiar with the problem of lack of confidence that is common in underrepresented groups.

Leaders often devote significant time to solving other people's problems, including inherited problems and cleaning up other people's messes.

Faculty in leadership positions are often viewed differently by their peers. By joining management they may be thought of as having gone over to "the dark side." The independence of faculty is one of the attractions of the career, but it can make it harder for academic leaders such as department chairs and school deans who may find it difficult to accomplish their goals. In industry, a change in policy at the top, such as setting a goal

of hiring more women and underrepresented minorities, can lead to rapid change within an organization towards accomplishing the new goals. This "make it so" approach rarely works in an academic environment, where change can be slow and frustrating because of the independence of faculty governance and careful faculty committee procedures.

Unfortunately, the nature of humor can change with leadership since leaders must be more wary of what they say. Their statements can carry weight and implications beyond what they intend, and even jokes can be taken in unfortunate ways and cause offense. Especially higher in the leadership ladder, there are no casual public conversations.

Campus politics among staff and faculty can be nasty and cause additional concerns and demand significant diplomacy skills.

There are additional dangers for women and underrepresented minorities in leadership positions. They have the added obstacle of

Paths to leadership: Jeanne Ferrante

1979–1994 IBM T.J. Watson Research Center
Never a manager, but had a great mentor: Fran Allen

1994– UCSD Computer Science Professor

1996–1999 UCSD CS Department Chair
Developed industrial liaison program

2002– Associate Dean
Developed Teams In Engineering Service (TIES), part of EPICS

fall 2007 Acting Dean

facing common stereotypes, resulting in their being viewed differently in leadership positions. Valian [28, 29] cites an experimental study where students were shown photographs of a group sitting at a table and asked to identify the leader of the group. When the group comprised only a single gender, then the person at the head of the table was identified as the leader. If the group was mixed gender and a man sat at the head, then he was always identified as the leader. If the group was mixed gender and a woman sat at the head, then she was labeled as the leader only about half of the time, with a man seated elsewhere being labeled as the leader the remainder of the time. These statistics were roughly the same regardless of the gender of the observer. A woman or minority leader may be viewed as a token figurehead or as being representative of all members of their gender or ethnic group, adding additional stress to the ordinary responsibilities. If you look different, questions will be asked and you will be treated as a spokesperson for your group.

Unfortunately some colleagues may feel that a woman in a leadership position is there simply because she is a woman rather than because she was the best candidate for the position. It has become true in recent years that more women are being interviewed for such positions as institutions try to provide diversity in leadership, but all current research indicates that the final hires are made on the basis of who is the best candidate. The push for diversity in institutions is aimed at ensuring

Paths to leadership: Maria Klawe	
1980–88	IBM researcher
1984–88	IBM research manager
1988–94	Head of CS dept., UBC
1995–98	Senior VP (IT + Students), UBC
1998–02	Dean of Science, UBC
2003–06	Dean of Engineering, Princeton
2006–	President, Harvey Mudd College

diversity in the pool of candidates, not in forcing a quota on the actual hires. Offers should be based on the quality of the candidate and not on gender or ethnic considerations.

Lastly, there is a risk of the presence of a woman or minority leader being used as an excuse for downplaying gender or ethnic imbalance in a faculty using the argument that one minority representative in a leadership position should be considered as having

solved the problem, when it has not.

3.4 Weighing the rewards and dangers

The upside and downside of leadership are both quite real, but the balance of opinion from the successful leaders at the workshop is that the good things far outweigh the bad things. The satisfactions and joys of having a major positive impact, of leaving an institution better than they found it, are incredible highs, and there are strategies and tricks for dealing with most of the negative aspects. Higher-level leadership positions provide a bigger playing field with more opportunities to make a difference. Furthermore, academia is about reinventing yourself and leadership does just that. It gives you the greatest possible opportunities to make a difference by initiating and guiding projects to improve academe and its impact and visibility. It also provides a different way in which to be creative. In most cases effective leaders find the leverage to achieve positive change is a good tradeoff with the grunge that comes with the job.

Some of the drawbacks of leadership can be eased by careful planning. With discipline, a department chair or even a dean can maintain a research program, and at most universities a high quality research program is more important to your career than teaching. A common approach is to set aside and protect a specific day a week for research. Teaching can be done when it fulfills a strategic goal such as covering a class that can benefit from your personal handling and the attention of a chair or dean. The difficulty of moving projects forward can be handled by building a consensus and seeking broad support. Dealing with unjust and inaccurate critics can be handled by concentrating on those who support you. Concentrate on the positives and do not dwell on the inevitable unhelpful sniping. Some people find it helpful to have a trusted friend or mentor to whom they can vent when things become noticeably stressful or people are behaving particularly badly.

3.5 Paths to leadership

Most academics end up being leaders in some form as part of their job. Some examples are viewed as chores — necessary service as part of being a good citizen — and others involve actively seeking a lead-

ership role to promote some project or change of personal interest. The typical beginning stages are leading a research group or chairing a committee. The research group might comprise only the professor and a collection of students, but it might also be a larger group involving multiple faculty, students, and staff. Typically one of the professors takes the lead, often by default because the others in the project are narrowly focused on their part only and would rather let someone else handle the big picture and overall organization. This latter talent is a sign of potential leadership — an interest in stepping back from the individual pieces to view the overall project, to stitch the pattern together and make things happen. You may recognize new talents and interests in yourself in these initial steps towards leadership.

Symptoms of an inclination for leadership include liking to solve problems or make a place better, and finding yourself working on things even when it's not really your job. Keep in mind, however, that at research universities the primary requirement for advancement is a solid reputation for research. Beware of time consuming diversions before you have established a high quality research program. The degree of risk of such tangents varies among universities, but there is always risk in not devoting a critical mass of time to research at the early career stages.

Being chair of a committee can come from either just taking a turn at it, or from a personal interest in the goal of the committee and the realization that the chair can guide the deliberations and have a major influence on the results. Being a committee chair also carries with it a hint of power, as the chair can set the schedule as well as guide the agenda, which can be a big advantage for personal time management.

At times, opportunities for leadership can arise by surprise when someone is acting like a leader without being aware of it. As an example, Eve Riskin of the University of Washington was an active participant in the NSF ADVANCE center at UW, of which the Dean of Engineering, Denice Denton, was PI. Eve did not consider herself a leader, but she often was one of the first to respond to email from Denice seeking ideas and advice, and Eve agreed to serve on a search committee for a director of the center. The committee did their work and found two excellent candidates, but neither worked out for a variety of reasons. At that point both the remainder of the search committee and Denice realized they already had the ideal

candidate in their midst, and offered the position to Eve. Her passion, participation, and activity made her a clear choice to everyone but herself, but she accepted because of the opportunities to have a significant impact on issues that mattered a great deal to her. She quickly learned the job and later was made an Associate Dean based largely on her performance as a center director. Most opportunities for leadership do not fall out of the sky like this one, but are a result of conscious choices made along the way in response both to your interests and to opportunities. Different choices can result in quite different paths towards leadership.

In general it is a good idea, and quite typical, to start with a small taste of leadership when the opportunity arises. This strategy provides an opportunity for a trial run and a chance to see how the benefits balance the time involved. Such beginnings can come about by invitation (and often do), but they can also be sought out by talking to academic leaders about the possibilities of assisting with ongoing or new projects.

Leadership becomes an increasingly important component of an academic career after securing tenure; however, a moderate amount of experience as a junior faculty member can help build a skill set for leadership and test an aptitude and inclination in a manageable way. It is not a good idea to jump into a major leadership position without a warmup to learn the ropes and gain the experience to grow into more critical positions. In particular, do not become a department chair or director until

Paths to leadership: Leah Jamieson	
1976	Appointed Assistant Professor at Purdue
1991–1998	Research group lead
1990–1996	ECE Graduate Program Director
1995–2006	Co-founder & Co-director/Director, EPICS (Engineering Projects in Community Service)
1998–99	President, IEEE Signal Processing Society
2002	ECE Interim Head
2003	IEEE Vice-President for Technical Activities
2004–06	Associate Dean for Undergraduate Education
2005	IEEE Vice-President for Publication Services & Products
2006–	Dean of Engineering
2007	IEEE President & CEO

you are tenured. At most institutions you should not accept such a position until you are a full professor, as chairs and directors risk making enemies.

Choices regarding leadership will arise throughout your career, and the several examples of paths to leadership boxed in this chapter demonstrate a few of the possibilities. While each path is unique, a few general observations can be made. First, these are paths that led to the upper echelons of leadership, but most of us will rise only part way up this ladder and eventually return to an emphasis on research and teaching. You must gauge your own aptitudes and passions in the early stages when making your decisions.

One critical decision will be how long you should continue in a given position. If things go well, opportunities for a higher position may arise naturally and present a clear path for advancement. Furthermore, serving too long in a single position runs the risk of its being identified with you too strongly and can make it difficult for a program to advance when you are no longer there. If things are not going well, do not abandon the effort too soon. Resigning from a position may mean that no further high positions are offered to you, and even if you are not happy you still may be able to accomplish important goals — and you will learn from the experience. It is better to move from an unhappy position into a parallel or higher position than to resign. If you enjoy constant contact with students and faculty, beware of positions that leave you little time and isolate you. Be aware that your potential impact can diminish with time, and it will be greatest if you come in as an accomplished outsider with the high hopes and expectations of the faculty. The more you are considered a long-time part of the organization, the less likely is major change. On the other hand, the good thing about being in a place for a long time is that you know the contexts for why things are the way they are. This means you must be more aggressive about making sure you change the things that need to be changed.

When considering a change in your position, do not look only at the best and most successful programs. Leading these may enhance your reputation, but your potential for significant impact may be small. Often an individual can have the maximum impact leading a less famous or even broken program, where the possibility exists for major advancement and growth in stature. The best position may not be the one promoted by your best friends, the strongest challenge may lie elsewhere. Provided that the position brings with it sufficient

resources and leverage, growing a young and enthusiastic faculty and integrating them into the development and strategic planning of the program as a meritocracy can reap huge benefits. If you do go to a highly successful program, then expect to find change more difficult and your marginal impact less. You can still have an impact, but the required approach is likely to be different. For example, you can distribute high praise among the faculty, but then suggest ways in which the wonderful program might be made even more wonderful. Again, it takes participation and teamwork to effect positive change; you cannot do it alone.

Paths to leadership: Eve Riskin	
1990	Appointed Assistant Professor of Electrical Engineering University of Washington
1995	Promoted to Associate Professor at UW
2002	Promoted to Professor at UW
2002	Appointed Director, ADVANCE Center for Institutional Change, UW
2005	Appointed Associate Dean for Academic Affairs, College of Engineering, UW

Often the first group that tries to create change will run into horrible resistance, and yet a few years later someone else can propose essentially the same ideas and everyone will get on board. People sometimes oppose things they know are right simply based on the person proposing it, and when the idea later resurfaces with a new promoter it gains acceptance. It is more effective and fun being in the second wave. Think carefully about when you want to make your move, and remember that it is much easier to change the system as a senior

person with external credibility. With determination, you will succeed, but you should always consider how much effort you want to expend to achieve a particular goal at a particular point in your life.

When considering moves during poor economic times, keep in mind that some “hot” areas will provide far more opportunities in funding and resources. They might not be precisely your area, but often the skills required have a huge overlap with other areas, including yours, and you can fit the bill by a shift in emphasis or applications without a shift in basic skills. The recent move of many academics in signal processing to bioengineering provides an example.

It should also be pointed out that, as the separate examples of leadership paths in this chapter attest, there are many paths to senior leadership. Of the first four women deans of engineering at R1 universities (Denice Denton at UW, Kristina Johnson at Duke University, Janie Fouke at Michigan State, and Ilene Busch-Visniac at Johns Hopkins University), none of them served as department chairs.

3.6 Leadership strategies

The beginning stages of leadership often do not require any special training, though some of the day-to-day skills of budgets, time management, planning, and dealing with people on cooperative projects are often developed early in an academic career. As one moves up the leadership ladder, however, formal learning of leadership skills can be a major advantage and save a great deal of time in the long run. The most common sources of such education are mentors — senior leaders with significant experience who are grooming a new generation for future positions. Formal training in workshops and seminars, and books and Websites devoted to leadership issues are also useful. The learning can be clustered into two types: the fundamentals of leadership which provide basic principles and views of successful leaders, and the tricks of the trade that are often anecdotal in nature, but which provide gems of tactics for managing the attendant chores and responsibilities with humor and good sense. A few examples of each are mentioned in this section.

Approaches to leadership

There are many models for leadership and a great deal of training material on the Web and in books. An example is the VRE training of Frank Green [10]. The acronym refers to the basic components of leadership of:

Vision Leadership means leading a group of people toward some goal, which requires a vision of where the group is going and for what it is striving.

Relationships Leadership means leading people, and that requires understanding what relationships are needed to achieve the vision, and building relationships.

Execution Leadership involves implementing the details of the plans and ensuring the execution that actually achieves the vision.

These separate components and their integration form the basis of this approach to leadership training.

Another overview of leadership is provided in the book *Leadership Without Easy Answers*, by Ronald A. Heifetz [16]. Heifetz makes the distinction between solving strictly technical problems, which can be done by expertise alone, and solving adaptive problems such as global warming and drug abuse, which demand innovative solutions. The basic strategies can be summarized as follows:

- Bring attention to the problems and difficulties
- Develop a shared vision with the community or team
- Overcome the resistance and reluctance to face the problem (a reluctance to reorganize)
- Manage conflicts and hold steady so tension can be managed
- Take risks and learn from failures
- Distinguish the difference between self and role — when to
 - “get up on the balcony” to see the larger picture
 - “get down on the dance floor” to join the dance

As the challenges of leadership are becoming more complex with a greater reliance on interdependent work, the nature of leadership is changing as the emphasis shifts from the heroic individual to collective teamwork [19]. The primary skillset is increasingly requiring flexibility, especially the ability to collaborate across boundaries, teamwork, the building and mending of relationships, and innovation in managing change. The best preparation for the future is the development of “right-brain” skills and a willingness to take on new and broad challenges. Finding a mentor who practices this style can be an invaluable asset.

Advice on leadership

Leading within academia is not just budgets and strategic planning; it depends more than ever on building consensus and relationships

among colleagues. Goals are achieved not by fiat, but by an understanding of the barriers and an ability to move people toward a common goal. The lofty goals can get somewhat lost in the details of administration, so it is useful to point out some aspects of leadership and offer some advice on handling them.

Decision-making

A daily aspect of leadership is the necessity to make decisions involving matters of finance, personnel, startup funding, space, facilities, human resources, building. You just do it. You make your best effort to consider what is in the best interests of whom you work with and for, and then do it. You revisit decisions when you have to. Decisions must be made in a timely fashion, no one else will make them for you.

Communications

Communication can be the most difficult thing for people in high leadership positions. Colleagues will often not tell the difficult truth to a Dean or President, and that can mean a lack of adequate feedback for crucial decisions. So work at opening communication channels with colleagues and staff, for example by regular informal meetings or lunches or “conversations with the Dean.” Also take advantage of feedback from the students and the junior faculty, who are often less fearful of the high powers of academia and more willing to provide honest opinions.

Team building

Do not try to do big things on your own, you need to build teams and share the load and the participation. Ideally, everyone on the team becomes a leader.

Crisis management

Crises will occur on an almost daily basis, and by definition their nature will be a surprise. You can plan on their occurrence, however, and budget time for dealing with the surprise issues that arise that must be handled immediately. Doing so lessens the surprise and the stress involved and they will seem less a disruption. A half hour is

usually sufficient time to do a triage and move the crisis on to the next step along the path, hopefully turning it into someone else's problem in the process.

Defining success

Do not drive yourself crazy by mourning the loss of your research and teaching time, you cannot maintain your research output at its previous level when you accept major leadership responsibilities. You can, however, redefine your personal success to give yourself credit for other accomplishments, which often will have a more far reaching impact on your institution and the outside world. Your success should not depend on research productivity alone.

Becoming a better leader

The following are several nuggets of advice for being an effective leader that emerged during the workshop.

- Think broadly about leadership, it is not just administration.
- Be positive.
- Get training.
- Build your own village of mentors.
- Prioritize your commitments. A dean will sacrifice a precious research day when a meeting with alumni might yield a million dollar donation.
- Recognize and exercise opportunities to grow into leadership roles and positions.
- Look inward: assess, recognize, develop your leadership skills, and discover where you are doing things well.
- Look outward: build a network of mentors/counselors/supporters. Don't lead in isolation.
- Let your (potential) interest in leadership experience be known.
- Stretch yourself — leadership means spending a lot of time outside of your comfort zone. Try approaches that don't feel natural.

- Make sure you include stress-releasing time such as exercising, hiking, painting, music, and shopping.
- Seek and welcome feedback and constructive criticism. As you rise higher in the system, your peers may be less inclined to tell you the entire truth and you may learn the most from students and junior professors.
- Think impact. What can you change? What can you make better?

“If it’s a good idea, go ahead and do it. It’s much easier to apologize than it is to get permission.” Grace Murray Hopper, computer pioneer

3.7 Mentoring for leadership

One of the responsibilities for leaders is to help others become leaders, and all of the academic leaders who participated in the workshop cited key examples of their mentors in their professional growth. Encourage anyone with an issue to become part of the solution. Recognize and reward leadership within your institution, as positive feedback goes a long way. You can encourage others to become leaders by discovering what they are passionate about and encouraging them to focus on those passions to effect change. Give advice freely, but do not expect it to be taken! And encourage, encourage, encourage.

Often potential leaders will lack confidence in their ability to lead, a feeling often associated with the “imposter syndrome” of highly talented people not believing that they are as good as their resume proves them to be. Such people may require particularly encouraging mentoring on the part of those that recognize more ability and potential in them than they may recognize in themselves. Women who succeed sometimes do so because they “ignore reality” and not let their own negative self-perception get in the way.

3.8 Diversity in leadership

Women and members of underrepresented minorities in leadership roles make the leadership teams to which they belong more heterogeneous, and research shows that the quality of innovation of a team

is a function of the diversity of the team — the more ideas and varieties of experience, the better the solutions.



Chapter 4

Promoting Fairness and Openness in Search Committees

Panel

Eve Riskin (Chair)	Associate Dean of Academic Affairs College of Engineering University of Washington
Maria Klawe	President Harvey Mudd College
Jeanne Ferrante	Associate Dean Jacobs School of Engineering University of California, San Diego

A fair and open search process is crucial to diversifying the faculty, while maintaining excellence. A common excuse for not hiring women and underrepresented minorities is that there is a very small pool of qualified candidates, exacerbated by a pipeline that shrinks at every step from undergraduate to full professor. However, with the right commitment to diversity, especially at the top leadership levels, a university can hire outstanding professors who will help them achieve a faculty that is more representative of our society. It is a common myth that promoting diversity implies lowering standards when instead its key goal is ensuring fairness and openness in generating and evaluating the candidate pool. The bottom line is always that the best candidate should be hired, but it can take a significant effort to ensure that the best candidates are seen.

The faculty search committee is arguably the most important and critical point at which progress on faculty diversity can be made. The strength and independence of faculty governance makes the search committee a point where forces can work for greater diversity.

4.1 Starting with data

Most faculty want to be fair in their hiring processes. To initiate change, start from your own historical data, and compare them to other schools. For example, the percentages of female tenure track and underrepresented faculty in Engineering at the top ten U.S. Engineering Schools, as ranked by *US News and World Report*, are shown below in Figures 4.1 and 4.2 for 2001–2006. These schools in-

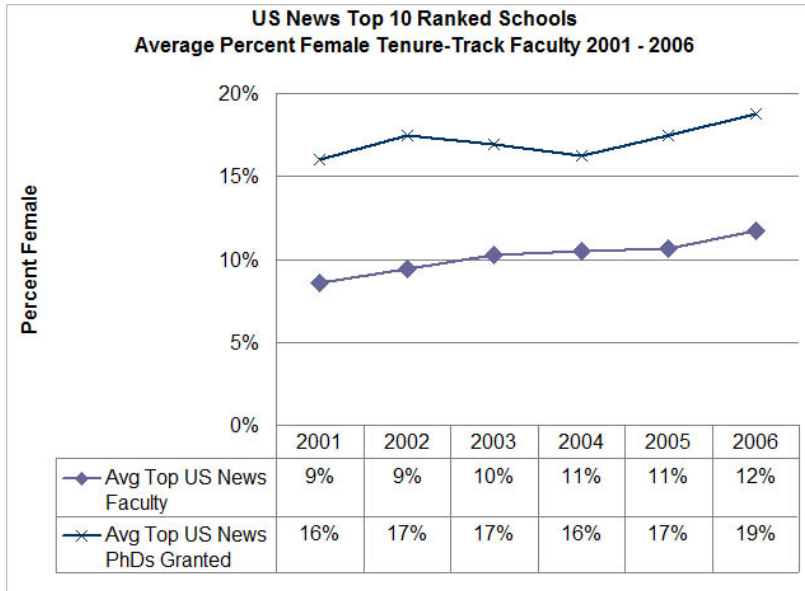


Figure 4.1: Average percentage female faculty in the top 10 *US News and World Report* universities.

clude MIT, Stanford, Berkeley, Illinois, Carnegie, USC, Michigan, Cornell, Texas at Austin, and Purdue, and the data source for them is <http://www.asee.org>. While both percentages are growing, there is a large gap between the percentage of female faculty at these schools

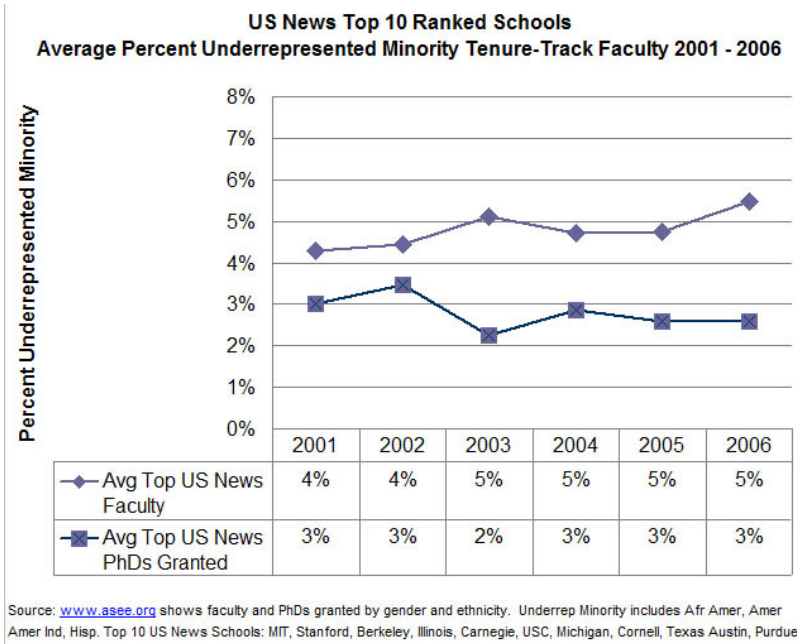


Figure 4.2: Average percentage underrepresented minority faculty in the top 10 *US News and World Report*-ranked universities.

and the number of PhDs granted to females. Underrepresented minorities include African-American, American Indian, and Hispanic faculty. For underrepresented minorities, the percentages at both the faculty and PhD levels appear stagnant, and the size of the pool is dishearteningly small. Clearly, the incredible shrinking pipeline [7] continues.

Such data can be used as the basis of faculty discussion at meetings or retreats, and contrasted with your individual school’s or department’s data. What is happening? How can we explain these data? Many feel that computer science, for example, suffers because of misperceptions of the field. There is a large industry demand, but many students and parents mistakenly fear that jobs will be outsourced and will no longer be available in the future. Stereotypes relating to technical fields are still being passed along by teachers, parents, and peers, and these stereotypes can discourage students who don’t see role models or receive much encouragement. Also,

engineering is perceived as not socially relevant, and as isolating; studies such as [17] show that women can be particularly affected by such perceptions. In addition, women and underrepresented minorities may be less confident about their technical skills than their peers.

Other data show that lack of negotiation skills can disadvantage women, and can have an accumulation of effects [28, 29, 2]. The negative effects of a lack of a critical mass of women and minorities can include a chilly climate and a feeling of isolation, neither of which is conducive to academic success. In short, there appears to be a Law of Educational Diversity: “Everything bad happens worse to members of out-groups” [18]. This negative atmosphere and perception may be bad for everyone, but women may truly be “canaries in the mine” [4].

4.2 Practices to promote fairness

There are a variety of means for improving the current situation by promoting fairness and excellence in faculty hiring. Several specific techniques and case studies follow in the next section that exemplify variations on these techniques.

Increasing the pool

Perhaps the most critical goal is to increase the candidate pool for searches. A small pool or a very narrow search is not likely to produce excellent or diverse candidates. One of the most fundamental principles of optimization is that the larger the set optimized over, the better the result. The most effective means of accomplishing this is to explicitly state in all searches that exceptional candidates *in all areas* will be given *serious consideration*. Some schools emphasize broad searches rather than searches for specific areas.

Increasing awareness of unconscious bias

Schemas are hypotheses we use to interpret the world [28]. Schemas are widely culturally shared. For example, gender schemas prevalent in western society assume that males are independent, task-oriented, and do things for a reason, while women are nurturing, expressive, and cooperative. Of course, both men and women have both of these

characteristics. Research shows that schemas are used by both men and women regarding gender, and that both whites and people of color hold them about race. (A similar idea appears in [15] as “thin slices.”) Schemas are often unconscious, and research shows that we apply them more under circumstances involving ambiguity, stress, time pressure, and where there is a lack of critical mass. These are often the circumstances surrounding decision-making in search committees, and the lack of critical mass of women and minorities on engineering faculties put them at risk for being evaluated unfairly by search committees.

The relevance of schemas to search committee decision-making is that schemas affect evaluation. We give a few examples here:

- Evaluation of CVs: White names favored over African-American names in otherwise identical CVs for interview callback (3:2) [3].
- Evaluation of resumes: “Brian” was preferred over “Karen” (2:1) using identical resumes [26].
- Evaluation of post-doc fellowship applications: Women had to be 2.5 times more productive to rate equally in scientific competence as the average male [31].

These and similar results have prompted the National Academies to state the following:

“Although scientists like to believe that they ‘choose the best’ based on objective criteria, decisions are influenced by factors including biases about race, sex, geographic location of a university, and age that have nothing to do with the quality of the person or work being evaluated.” [13]

What can we all do to counteract such bias? We must educate ourselves to be aware of schemas, and learn to question our assumptions. An excellent review of bias literature is available on-line from the University of Wisconsin ADVANCE program at <http://wiseli.engr.wisc.edu/initiatives/hiring/Bias.pdf>

Clarifying evaluation metrics

When evaluating candidates, above all we should use clear metrics. As part of the NSF ADVANCE program, the University of Michigan STRIDE Committee “provides information and advice about practices that will maximize the likelihood that diverse, well-qualified candidates will be identified, and if selected for offers, recruited, retained, and promoted.” As part of their mission, this committee has developed a form to evaluate candidates based on potential for

- Scholarly impact
- Research productivity
- Research funding
- Collaboration
- Fit with department’s priorities or strategic plan
- Improving department’s climate
- High quality graduate student supervision
- Teaching
- Good citizenship
- Leadership, and
- Contributions to diversity.

(More information (including the form) can be found at <http://sitemaker.umich.edu/advance/STRIDE>.)

There are multiple thrusts to the ADVANCE program at Michigan, so positive outcomes cannot be attributed to any one component. However, the percentage of women hired in Science and Engineering went from 15.7% in 2001 to 31.3% in 2003. Again, it is imperative that positive outcomes in hiring must go hand in hand with strategies for retention.

Amplifying successful search committee methods

Positive deviance (www.positivedeviance.org) is a strategy that is based on finding already successful groups or individuals in a culture, determining how they operate successfully, and then supporting the spread of these successful practices. In applying these ideas to search committees, ask

- Which search committees/chairs are already being successful?
- What successful practices are being used that are different than the norm?
- How can these practices be adapted at your institution?

It is important to continue to monitor and evaluate progress of successful practices. Examples of successful search practices include:

- Going to conferences to look for good potential faculty to recruit
- Being open about your university's dual career policy, if applicable, so that candidates feel comfortable disclosing their dual career status early enough in the search process for you to be able to accommodate the partner
- Tracking excellent undergraduates from your institution so that you can hire them back when they complete their PhD
- Ensuring that women candidates meet women faculty during their interviews and that underrepresented minorities meet underrepresented minority faculty during their interviews. The Electrical Engineering Department at the University of Washington has the practice of having an all-women faculty dinner when women candidates interview. This has been extraordinarily successful; between 1991–2007, only one woman candidate turned down an offer.
- Calling up colleagues to ask for names of good women and underrepresented minority candidates. Unless specifically asked, people may just mention their best male students.

Adding change agents

Another recruitment success story from the NSF ADVANCE program is the establishment of Equity Advisors at the University of California, Irvine. Equity advisors are appointed to “participate in faculty recruiting by approving search strategies and raising awareness of Best Practices; organize faculty development programs, with both formal and informal mentoring; as well as address individual issues raised by women faculty.” (See <http://advance.uci.edu/> for more information.)

At UCI, Equity Advisors are senior faculty members in each school who are appointed by and report to the Dean for a 2-year term with stipend. As indicated, the Equity Advisors participate directly in departmental recruitment processes, meeting directly with search committees, and addressing problems and issues that arise. Equity advisors also implement mentoring and faculty development programs tailored to their school. In addition, they work toward eliminating faculty inequities.

Again, there are multiple components to the UCI ADVANCE program, but it has had successful outcomes. The percentage of women hired at UCI went from 27.5% in 2002 to 57% in 2006. The results in different schools varied, with Information and Computer Sciences experiencing a large gain, while Engineering did not.

What could be behind the success of Equity Advisors? An intriguing insight is given by recent work on mock juries [25]. In this work, mixed ethnicity and all Caucasian juries separately viewed a video trial of a black defendant. Surveys were given to each jury before discussion, but after the juries were constituted. The juries were then left to deliberate the case, with the proceedings recorded and analyzed afterward.

The results of this analysis showed that mixed groups performed better in their decision-making. Caucasians on mixed juries cited more facts, made fewer mistakes, and were more willing to discuss race during the deliberation than they were on all-Caucasian juries. In the pre-trial survey and before discussion, Caucasians on mixed juries were more open-minded toward the defendant. Information exchange alone was not the factor that led to better performance.

These results suggest that “reminders” to avoid prejudice can lead to more systematic decision-making. Perhaps constituting a more diverse group, or the presence of an equity advisor at a search

committee to remind people of diversity issues, can lead to more effective and more fair decision-making.

Proactive senior administrators

Deans can enhance and promote fairness in search committees by incorporating the goal of a diverse faculty into School strategic planning and ensuring the sharing of statistics and successful methods among departments. Deans can provide leadership and information on how to identify and recruit outstanding female candidates

Incentives

Universities and Schools can provide incentives in the form of new FTEs (“full time equivalents,” faculty billets for tenured or tenure-track positions) for outstanding women or underrepresented minority candidates.

4.3 Case studies

University of California, San Diego

Since 2004, the UCSD Jacobs School of Engineering faculty job postings have included explicit language to the effect that exceptional candidates in all areas will be given serious consideration. In addition, all applicants are asked to include a personal statement summarizing teaching experience and interests, leadership efforts and contributions to diversity. The Dean’s office gives departments flexibility in adapting such language in their advertisements, but also checks each ad to make sure it is included. In addition, the Dean also holds back 1–2 FTEs each year for use for targets of opportunity. The outcome has been 7 new women faculty hired in Engineering from 2004–2008. This contrasts well with hiring data for the years 1995–2003, which had a net gain of 55 new male faculty and a net loss of 2 women. It is of course important to recognize that positive outcomes in hiring must also be accompanied by positive outcomes in retention.

Princeton University

In January 2003, 12 of the approximately 125 faculty in the Princeton Engineering School were female. During Maria Klawe’s three and

half years as Dean of Engineering at Princeton, January 2003 to June 2006, half of the eighteen faculty hired in engineering were women. Many factors contributed to this increase in the hiring of women, including changes within the Engineering School and at the university level.

The first step within Engineering was a strategic planning process that helped the faculty conclude that diversity should be a core value/goal. The Engineering School held a series of eleven one-day workshops with Engineering faculty, staff, alumni, students, faculty from the rest of the university, and faculty from outside the university. Previously, the six Engineering departments did not talk to each other because there were no school-wide meetings. The workshop process enabled everyone to hear each other, and empowered individuals who felt undervalued to become engaged and contribute to the reform. Because each workshop was planned and led by a separate steering committee with a large faculty component, over 60% of the Engineering faculty served on a steering committee. This gave the Engineering faculty members ownership of the process and of the resulting strategic vision, which included diversity as one of its six themes.

A second factor at the university level was the creation of Target of Opportunity (ToO) faculty slots. Each year Princeton provides a small number of 0.5 FTE slots to give to departments that want to hire excellent candidates who would help diversify the faculty. A university-wide ToO committee considers formal applications from individual departments for these slots. The departments provide the ToO committee with a CV and the reason why the candidate should be recruited to Princeton. Candidates for ToO slots are required to be significantly stronger than the already high threshold set for regular positions. This ensures that faculty hired with ToO slots are not perceived as token diversity appointments. The departments cannot game the system and save their regular slots for Caucasian males because the Dean of the Faculty, who chairs the ToO committee, also monitors how each department fills its regular openings. Of the nine women hired in Engineering during Maria Klawe's time as Dean, ToO slots were obtained for four of them. The existence of ToO slots encouraged departments to be constantly on the lookout for outstanding women who might be recruited to Princeton. In at least one case a department used its regular opening to hire a woman originally identified as a potential ToO candidate.

Another helpful change at the university level was the appointment of a special assistant to the Faculty Dean's Office to monitor and support the hiring of female faculty as well as other gender equity issues. When the Engineering department chairs were informed that during the period of a year, all ten assistant professor offers made by the Engineering departments had been made to while males, the chairs agreed that changes in departmental search processes were needed in order to achieve the strategic vision diversity goals. The Engineering School created a FTE diversity task force to gather and disseminate best practices on diversifying candidate pools and ensuring fair searches. The result was a significant increase in the number of assistant professor offers made to women in the following year, from zero to four.

University of British Columbia

From 1988 to 1998 the number of women faculty in Science at UBC went from 11 (3.9%) to 22 (7.7%). By 2002 the number had again doubled to 44 (15.4%). These increases were the result of several efforts specifically targeted to increase the number of women faculty.

At the university level the Provost provided support for spousal recruitment. By 2002, 16 of 44 female faculty were part of a faculty couple in Science. The most common form of support for spousal recruitment was as follows. The provost provided 1/3 of a faculty slot for the "trailing spouse", the department hiring the "leading spouse" paid for 1/3 of a faculty slot for the trailing spouse for a number of years (usually 3 to 5), and the department hiring the trailing spouse covered the remainder. Similar arrangements were also made available for same-sex and common-law couples.

At the Faculty of Science level, the Dean provided top-up funding for recipients of Natural Sciences and Engineering Research Council of Canada (NSERC) University Faculty Awards (UFA), making such a hire free to the department during the recipient's first 3 to 5 years. The UFA awards are specifically addressed to increase the representation of women and Aboriginals in the natural sciences and engineering faculty. Applicants for UFA awards must not have held a prior academic position in Canada, and the selection is made by a national committee. Of the 25 women hired in Science over the 4 years from 1998 to 2002, at least 9 were recipients of UFA awards.

At the department level, proactive steps were taken to identify

and recruit outstanding female candidates, and the number of women in every science department significantly increased. For example in 1988 the Mathematics Department had 55 faculty with only 2 women while over 1/3 of its students were women. It had been fourteen years since the appointment of a woman faculty member. The Dean asked the math faculty to identify women faculty of any level anywhere in the world that the faculty would most like to see join their department. The department then agreed on their top candidates, a list of about ten women. These women were contacted and asked if they would seriously consider a suitable offer to come to UBC. Five expressed interest, and five broad searches were launched with criteria including these “dream” candidates. It was understood that if someone else (e.g., a man) won the search by being clearly the best candidate, then the search committee decision would stand. Initially this process resulted in hiring only one of the dream candidates. However, the work that had been done in identifying stellar possibilities at all levels, including graduate students and postdocs, resulted in several more women being hired in math over the next few years. By 2002, there were seven women faculty in math, and by 2007 math had its first female department head, one of the initial dream candidates.

4.4 What can a single faculty person do?

Individual faculty members can obviously promote good search practices through service on search committees. They can have an even greater effect by participating in the selection of academic administrators, those who appoint the search committees and lead the evaluation and decision efforts. This can be mean serving on search committees to fill dean, chair, and director positions, or relaying concerns regarding these issues to those making the decisions. Individual faculty should ask questions of academic administrators regarding the goals and policies for faculty search and how the actual statistics measure up. If the goals are lofty but the results abysmal, then something is broken and the existing structure needs to be reconsidered. It often helps to invite speakers involved with success stories elsewhere to address faculty meetings. Lastly, surveys of the faculty climate towards diversity such as those conducted at MIT and Princeton can shed light on the actual situation as well as the perceived situation.

4.5 Conclusions

The faculty search committee is an institutional fault line, where energy can be released toward positive academic cultural change. The good news is that most faculty want to be fair. To further this end the following initiatives can be put in place:

- Start with data
- Broaden the pool by changing the search language
- Educate to help overcome unconscious bias
- Discuss the fairness of search committee metrics
- Reward positive deviance on search committees
- Increase awareness of diversity to encourage better performance
- Serve on search committees for academic leadership positions to ensure that incoming leaders are diversity advocates
- Engage academic leaders in discussions about diversity
- Recognize that “The problem is not simply the pipeline.” [13]



Chapter 5

Faculty and Family

Panel

Pamela Cosman(Chair)	Professor University of California at San Diego
Ayanna Howard	Professor Georgia Tech
Leah Jamieson	John A. Edwardson Dean of Engineering Purdue University 2007 President and CEO, IEEE

5.1 Introduction

Academia is often thought of as a demanding career, one in which it is hard to balance the competing demands of work and family life. Indeed, the timeline of tenure places particularly heavy demands on assistant professors, tending frequently to be the same time of life when couples start families. But academia also offers certain advantages for balancing career and family, including tremendous flexibility in scheduling activities during the day (“You may have to work 60 hours per week, but it can be *any* 60 hours you want.”)

In this panel session, we discussed ways to help balance the competing demands of work and family life. We looked at two levels: what you can do to help yourself, and what the institution you work for can do to help you. This chapter is organized as follows. We be-

gin with the institutional policies that help faculty members balance work and family life. After briefly surveying the current mainstream policies, we discuss the culture of implementation of these policies, and look at the forefront policies of institutions that are in the vanguard of being family-friendly. Second, we look at personal strategies for work-life balance.

Survey of current family-friendly policies

There are many different family-friendly policies in place at colleges and universities around the United States, ranging from tenure clock stop to employment help for the spouse or partner of a faculty member. The data presented in this section is taken from [6], a 2005 study of 256 institutions of higher learning done by the Center for the Education of Women at the University of Michigan. Some of the observations and comments on this data are also a summary of [22], and others are from the discussion at the BIRS workshop.

Tenure clock stop

Tenure clock stop policies are the most widely available policies, found in 43% of all institutions surveyed. They are widely available presumably because there is no direct cost to the institution for implementing them.

A pause in the tenure clock is made to accommodate special circumstances, such as the birth or adoption of a child, serious illness in the faculty member, or extensive care needs of a dependent. After the pause, the tenure clock is then restarted with the same number of years left as before the pause was initiated. While 43% of all institutions surveyed had formal policies, there was considerable variation across different



institutions. Of research I and II universities, 86% had formal tenure clock stop policies and 4% had informal policies, while only 23% of baccalaureate institutions had formal policies (9% had informal ones).

Research, doctoral, and associate degree institutions were most likely to have a gender-blind approach to this policy, while master's and baccalaureate institutions were less likely to make the policy available to male faculty with newborns than to female faculty. For example, the University of Washington employs a gender-blind approach to this policy: "The University recognizes that under special circumstances, such as care for new infants, faculty women and men must devote extraordinary efforts to their family responsibilities, which may significantly detract from their research and academic capabilities..."

Modified duties

Modified duties generally allow for reduction of teaching, research, or service load for one or two quarters with full pay. This benefit allows faculty to spend more time caring for infants, elders, or ill spouses or partners. Modified duty policies are more likely to be given to women faculty who gave birth than for other dependent-care reasons. Eighteen percent of surveyed institutions offered formal modified duties policies. Of research I and II universities, 32% had formal tenure clock stop policies and 6% had informal policies, while only 17% of baccalaureate institutions had formal policies (19% had informal ones).

There was considerable discussion at the workshop (reflecting considerable national discussion on this issue) of whether this particular policy should be gender blind or not. Women who give birth tend to use a policy of this type to recover physically from giving birth and caring for a newborn (e.g., sleeping) and also to spend more time with their newborn (e.g., breastfeeding). Men whose wives give birth may tend to use this policy to do more research than they would be able to if they had to teach. Whether or not this policy should be gender-blind depends in large part on the goal that one is trying to accomplish. One possible goal is to level the playing field, that is, to try to remove some of the difficulties women face career-wise from giving birth and caring for a newborn. If this is the goal, the policy should not be gender-blind. It should theoretically contain

a component (for example, 4 weeks' leave) that is directly related to physically recovering from childbirth. It should contain another component (say, 8 additional weeks' leave) that is for the primary caregiver (whether male or female) of the newborn. Of course, a complicating factor in all of this is the difficulty of aligning childbirth teaching leave with the classroom teaching that occurs on a quarter or semester schedule. It is hard enough aligning a typical leave with a quarter schedule, and aligning separate components of leave (say 4 weeks for childbirth and 8 weeks for newborn care) potentially for 2 different parents would be even harder. A second possible goal, of course, is to simply make life easier for everyone (both fathers and mothers) who has a newborn, recognizing that this is a stressful, exciting, and distracting time for everyone. If this is the goal, then the policy should be gender-blind. Again, there could be one component of teaching leave that is gender-blind, and one component that is not.

Paid dependent-care leave

Paid dependent-care comes in many forms, including maternity or paternity leave, eldercare leave, leave to care for ill spouses and partners, and paternal leave. This policy is often offered to both men and women faculty with newborn children, however, only 16% of surveyed institutions had a formal, paid, dependent-care leave policy. Given the cost incurred by the institution, paid leave is much less likely to be offered than unpaid leave. However, it is more likely to be offered at institutions with large budgets and large student bodies, as is the case with most family-friendly policies. Of research I and II universities, 22% had formal tenure clock stop policies and 1% had informal policies, while 16% of baccalaureate institutions had formal policies (9% had informal ones).

Unpaid dependent-care leave

The U.S. Family Medical Leave Act (FMLA) establishes that employers with 50 or more employees must allow up to 12 weeks of unpaid leave in order to care for newly born, adopted, or fostered children, to receive care for a serious health condition, or to assist a family member receiving care. FMLA rules do not consider parents-in-law, significant others, or domestic partners as qualified family

members; however, employers are free to have expanded definitions of this term.

Many institutions offer unpaid dependent-care leave benefits that go beyond what is required by FMLA. The institution does not bear any direct cost for providing unpaid leave. Of the 40% of institutions that offer more leave time than the required 12 weeks, 60% said that the amount of leave was negotiable. Seventeen percent said that the amount beyond 12 weeks was restricted to a specific number of days (ranging from 1 to 364 days). Again, there was significant variation across the different types of institutions. Of research I and II universities, 53% had formal tenure clock stop policies and 12% had informal policies, while only 24% of baccalaureate institutions had formal policies (9% had informal ones).

Reduced, part-time, and job-share appointments

A reduced or part-time appointment is any time a faculty member is working less than a 100% appointment. Pay and benefits are proportional to the percentage of effort reflected by the appointment. Job-share appointments allow two faculty members to work part-time while fulfilling the requirements of one full-time faculty member between them.

Research institutions are the most likely to offer such benefits, with 29% of survey respondents offering reduced appointments and 23% offering job-sharing appointments. Formal policies for reduced appointments for extraordinary needs (sick child) were about as common as formal policies for reduced appointments for ordinary needs. However, informal policies for reduced appointments for ordinary needs were much more common (15%) than informal policies for reduced appointments for extraordinary needs (0%). These informal mechanisms varied from department to department, rather than being formal, institution-wide policies.

Employment assistance

One of the difficulties of having a dual-career family is finding suitable jobs for both partners in the same city. Some universities, especially research institutions, have started programs that help in job searches and placements for a faculty member's spouse or partner. These are usually called "dual-career hiring" or "trailing-spouse" programs.

The programs can be run either through a centrally run university office or they can be more informal, with two departments working together to come to an agreement about who pays what percentage of salaries.

Culture of implementation

When one is looking for a job at a university, and trying to evaluate family-friendly policies, most of the evaluation is at the level of “is there a policy or not?” or “what does the policy say?” rather than at the level of the culture of implementation. For example, a modified duties maternity policy may be evaluated at the simpler level by asking whether one gets one quarter off of teaching or two, whereas at the deeper level, one asks who pays for the time off, who approves the time off, and so forth. Beyond just finding out what policies are in place, it is important to learn how the available policies are implemented. How a policy is worded and funded can directly impact how it may be implemented in your case. In this section, we discuss some of these issues of the culture of implementation.

Education about the policies

Family-friendly policies are only helpful if you know about them. In a recent UC Berkeley survey of over 4000 University of California faculty members, only 25% of faculty knew a bout all four available UC family-friendly policies. Low awareness rates seem to be a problem at many institutions. Institutions with progressive family-friendly policies should make policy information widely available through training sessions for new deans and chairs, at faculty orientations, in mentoring programs, faculty handbooks, brochures and other printed materials, on websites, and through periodic programs.

Funding a policy

If teaching relief is offered for childbirth, who pays for the replacement teacher? If the department pays, there may be subtle pressure not to take the teaching relief, especially in small departments. However, when the burden of cost for replacement faculty is carried by the university instead of the department, the climate is more accepting of work-family policies. Half the surveyed institutions reported centralized funding of family-friendly policies.

Entitlement vs. Discretionary Language

Wording that gives the faculty member entitlement makes policy the norm instead of the exception. This both reduces fear that in requesting to use a policy, the faculty member will appear less successful, capable, or hardworking, and it also removes perceptions of inequitable treatment among faculty members. For example, the phrase “You may request a one-year tenure clock extension” puts the onus on the faculty member to ask for the policy to be put into effect. The words “may request” can make the faculty member feel that he/she is requesting special treatment, and the word



“request” also suggests that someone can then deny that request. A more progressive wording would be “Tenure clock is automatically extended for one year (you may request that the extension be removed).” In this case, the tenure clock automatically pauses for a year, no questions asked. If the faculty member does not need and does not want the extension, he or she can take action to get it removed. In this case, there is no sense of requesting special treatment in availing oneself of the policy. Mit is tenure clock stop policy demonstrates entitlement language: “... a woman who bears one or more children during her tenure probationary period will have that period extended by one year.”

Some schools use two-tiered language for their policies, implementing both entitled and discretionary clauses. It might seem counter-intuitive at first, but entitlement language does have its disadvantages. With broad qualifying criteria, policies may be extended to those who do not need it — such as to a new parent who has a stay-at-home spouse.

Eligibility criteria

Most work-family policies were created to accommodate pregnancy, childbirth, and newborn care. Some institutions are changing language to integrate other qualifying events, such as newly adopted children, care for ill family members, and time off for public service. There are sometimes qualifications that need to be met in order for the benefit to apply to your case.

For example, if both partners are employed at the institution and they have a child, it is important to find out whether the new parents will be able to take leaves of absence/modified duties concurrently, or whether one will have to wait until the other returns to work. In non-traditional families, it is important to investigate the language regarding domestic partners, step-children, etc. Time off for domestic partner care is still the exception, not the rule.

Sometimes certification or documentation will be required. Some universities require a father to provide documentation that he is providing care of at least 40 hours per week in order to receive tenure clock stop or a leave of absence. This requirement is designed to avoid the scenario where the faculty member has a stay-at-home partner taking on the role of primary caregiver, essentially giving the faculty member a sabbatical.

Eligibility criteria are related to the goals of family friendly policies at institutions. Some common goals include:

1. lessening gender inequality
2. improving the work-life balance for everyone
3. recruiting and retaining top-notch faculty.

There can be a conflict between the first two goals. If the policies are extended to everyone indiscriminately, then work/life balance is improved for everyone. However, the gender inequality will not be lessened, because male faculty members are more likely to have a stay-at-home wife take care of the children, and use teaching relief to focus more on research.

In addition to eligibility requirements, most policies have language determining how many times a policy may be used over the course of a faculty member's career. For example, the University of Minnesota allows tenure clock stops twice for care of a family mem-

ber with a serious medical condition, but does not restrict use of the policy for childbirth, adoption, or foster care.

Battling perceptions

Faculty members are often hesitant to use family-friendly policies because of fear that they will be viewed as “lagging behind” in research productivity. Others worry about stricter performance standards. For example, if the tenure clock is stopped for a year, a faculty member might be concerned that they will be expected to have an extra year’s worth of research. It is important for institutions to make clear to both faculty and tenure review committees that if a faculty member works half-time for 2 years, he or she should be held to a 1-year standard.

It seems that some of these perceptions are imagined, however. Research shows that a majority of faculty, regardless of gender, rank, and family status, support a range of family-friendly policies, such as paid leave for childbirth and newborn care, unpaid leave for ongoing infant care, and tenure clock stoppage. These are the same faculty members who reported that they thought taking advantage of these policies would hurt them professionally.

More enlightened schools try to combat these perceptions by informing both internal and external evaluators of their policies in tenure review. For example, the University of Maryland’s non-discrimination clause states, “No person shall be discriminated against in any promotion and tenure proceedings for seeking or obtaining an extension under this provision.”

Some tips

Some things to ask when looking at a job offer:

- Is teaching relief paid for centrally?
- Is there a written policy on how extended tenure cases should be evaluated?
- Are there measures of career outcomes, such as retention, of policy users?
- What kind of work/life advisors exist on campus?

- Is there training at the departmental level in these policies?
- What percentage of eligible faculty make use of family-friendly policies?

Some tips for faculty mentors:

- Try to stay up to date on the policies
- Be aware that most faculty do not know the policies, and that policies change over time. So do not tell your mentee that Jane in the CS department had a baby 3 years ago, so she's the person to talk to. While it may be helpful to talk to her, she also may be out of date.
- Help your mentee realistically assess whether to use the policies available.
- Remember that a majority of faculty support of the use of these policies.
- Help create a climate where faculty feel safe using these policies. For example, if you can't attend a meeting because of family reasons, state the reason.
- Be an advocate.

Improved family-friendly policies

In 2006, the American Council on Education and the Sloan Foundation held a competition for accelerating family-friendly policies at universities. Fifty-five research universities sent in proposals for this competition. Five winners were chosen and were awarded \$250,000 to improve policies at their universities. The five winners, University of Washington, University of Florida, Lehigh University, Duke University, and University of California (Berkeley and Davis) chose to improve and enhance their existing policies in a variety of ways.

Three of the five Sloan grant awardees intend to create expanded childcare options. The universities intend to increase on-campus facilities and benefits, create emergency back-up childcare options, and help pay for childcare expenses related to university travel.

Three of the five schools also intend to add programs to aid faculty with career transitions. These programs include flexible part-time options, career transition advisors and grants, and pre- and post-retirement work programs.

Four out of five winners will create some form of dual career assistance program. Their proposals include centrally funded relocation counselors and creating affiliations with regional resources, such as neighboring universities, industry, hospitals, and non-profits.

Every school recognized that one of the greatest hindrances for faculty was lack of awareness of available programs. As a result, all five schools will work to expand awareness across campus. They will implement written guidelines, centralized funding of teaching replacements, awareness campaigns, training of deans, chairs, directors, etc.

Some other new policies from the schools include:

1. Increased paid leave
2. Presidential Council on Diversity and the Status of Women
3. Peer support group for “new mom” faculty
4. Adoption benefits and tuition reimbursement for faculty and family members
5. Elder/adult dependent-care counselor

5.2 Personal strategies

In a survey published in Sue Rosser’s 2004 book, *The Science Glass Ceiling* [24], 32.4% of women scientists stated that the most significant issue facing women scientists is the pressure of balancing career and family. In most cases, it is still the woman’s responsibility to maintain the household and care for children, even if both spouses are working full time. Trying to balance family, work, home, and community responsibilities can result in stress, exhaustion, and a sense of guilt. There are many coping strategies, however, that can help make the balance easier.

Time management

Time management does not happen by accident; it requires a lot of thought and analysis to figure out what works for you. Here are some ideas for time management:

1. Establish your absence as well as your presence both at home and at work. This means setting a schedule for being physically elsewhere and unavailable, and sticking to it. But also guarantee set times when your children know you will be home. They will know what to expect and that their needs are your highest priority.
2. Develop and nurture family traditions and rituals in your schedule. For example, have dinner and watch a favorite TV show when your family eats at home. If you and your spouse do not see enough of each other at home, schedule lunches together and do not break them. Let your assistant know that you are unavailable at certain times.
3. When you are at work, one approach is to work until your task is done. Another approach is to work on every task with the goal of making progress during a specific amount of time and work until that time is up. Then move on to the next task to maintain forward momentum. While it can be tempting to do so, do not get so obsessed with perfecting one project that others (or your family) slide off the table.
4. A big part of time management is organization and planning not only for the short-term, but looking ahead to the future. Plan ahead for major stress periods at work. You know when the big conference is coming each year. You know your proposals are due the same time every year. Schedule in advance, get the other things out of the way beforehand so you are not so pressed for time that you live at work and do not see your family for a few weeks because of stress. On top of that, be open and honest with your family when you are temporarily stretched beyond your means, and let your family know in advance when work is going to get hectic.
5. Make time do double-duty. For example, Prof. Jamieson plans a lot of her work out in her head. Instead of just driving during

her commute, she thinks through the organization of a new paper, or plans out a talk she's scheduled to give before sitting down to write anything on her computer. Then, when she is at her desk, it is merely a case of transcribing ideas. You can do this when you are taking a walk or when watching videos with your family too - how much of your brain power really needs to be devoted to Spongebob?

There are other opportunities throughout the day when you can accomplish two things at once. If you live close enough to work to bike or walk, you are both commuting and getting in your daily exercise. Prof. Cosman has biked to work for the past 12 years. Spending time with the kids doesn't have to be sitting on the couch watching TV, it can be bike riding, playing sports, or even playing active video games like Dance Dance Revolution. All of these activities allow you to do double-duty of family time and exercise.

Prioritize

Spend time on the most important things and cut out the mundane tasks. If you do not enjoy cleaning, laundry, yard work, cooking, or commuting, then stop doing them. Hire someone to take care of household chores. Move closer to your university. If you are spending an hour and a half each day commuting, that's an hour and a half you are not spending with your family or at work — an hour and a half of non-productive time. Learn to give up control. Delegate everything you can possibly delegate, leaving the most important tasks for yourself. Use your administrative assistant efficiently.

Relax your standards on things. Your car doesn't need to be washed as often as you think. In fact, quite possibly your car doesn't ever need to be washed. Your children do not need to be washed as often as you think either. Prof. Cosman thinks bathing kids once a week is fine. If they go in the swimming pool, the chlorine kills most of the bugs, so in that case they do not even need the weekly bath. Following this reasoning, one of her kids didn't take a bath or shower for 5 weeks, and nobody seemed to notice.

A major part of prioritizing involves learning when to use "yes" and when to say "no." Seek out extracurricular activities that are of interest to you and say yes to them. It is easier to say no to unwanted tasks if you've already committed to something you do want to do.

Childcare and eldercare

Coordinating childcare is one of the most important ways to balance family and work. Above all else, it is important to arrange reliable, convenient childcare. Sometimes the most convenient option will be on-campus childcare centers, but you may also have more luck with a nanny or daycare center off-campus. Prof. Howard suggests spending whatever it costs on childcare with flexible hours that is close to your school. Prof. Cosman favored in-home care by a nanny. In comparing daycare versus a nanny, the advantages of daycare include that it is less expensive (if you have only one child), that you may have long hours available to you if needed on any particular day, and that you can rely on the availability (e.g., you do not have to worry about a nanny being sick or showing up late). Advantages of a nanny are that you do not have to drive the child anywhere, you do not have to stay home when the child is sick, and the nanny can help out with other household chores.

When you have a school-aged child, be creative with summer care. Daycare centers and nannies aren't the only options available. Prof. Jamieson co-hired a Child Development major for several summers with another professor to watch their children. Many university campuses also have summer camps on campus that focus on a variety of topics that might interest your child — science camps, sports camps, etc.

it is also important to be realistic about eldercare. If you have a parent or parents who will need your help regularly, but also live fairly far away, think about moving them closer to your home. You can't fly out every weekend to help out, or drive for several hours multiple times a week. Moving your parent(s) closer might help them retain more independence than they could have living a great distance from you.

Travel

Arranging travel can be difficult with children, especially with young children. Prof. Cosman said she only went to one conference per year for ten years once she had children. This was not a professional problem. She still published plenty of conference papers, and her students were always enthusiastic about going to present papers for her. Once your children are older, you can take advantage of busi-

ness travel as family travel and expose your children to a variety of cultures around the world when you go to conferences and meetings.

When it is impossible to avoid travel or integrate family travel into business travel, make use of technology that will allow you to connect with your spouse and children while you are away. Aside from the old standbys of phone and email, use instant messages and teleconferencing, or even send homework corrections by fax.



Connect with your children

Talk about work at home. Make it accessible — talk about exactly what you do so your children understand, not in terms of stressors or problems. Bring your child to your office or lab to really show them what you do. When your child has a good understanding of your job and work isn't just some fuzzy concept, there is less separation of work and family. Also, take an interest in your child's interests. Let the child pick something they are passionate about and support their interest in it. One parent told her eight-year-old, "any book you would like us to read, we will read," and her older child "any video game you want me to play, I will play."



Chapter 6

Managing and Evaluating Mentoring

Panel

Ayanna Howard (Chair)	Associate Professor School of Electrical and Computer Engineering Georgia Institute of Technology
Tyseer Aboulnasr	Professor of Electrical Engineering Former Dean of the Faculty of Engineering University of Ottawa
Linda Jones	Director, Picker Engineering Program Smith College
Janet Rutledge	Senior Associate Dean of the Graduate School University of Maryland, Baltimore County

Within the context of increasing the number of women in academia, mentoring can aid preparation for and retention within the community of engineering researchers and educators. Mentoring does this by providing access to information, encouragement for achievement, and advocacy for advancement. Mentoring can play an important part in the transition of doctoral students into faculty positions, junior faculty to tenured status, and tenured faculty to the rank of full professor and administrative leadership. Successfully encouraging these transitions requires thinking critically about (a) what mentoring is and is not, (b) what the benefits of mentoring are and how they should be evaluated, and (c) how positive mentoring climates are designed and how successful mentoring practices are institution-

alized at the departmental, university, and national levels in order to promote the success of women engineering faculty.

6.1 Mentoring defined and explained

Mentoring is the application of the insights and experiences of one or more individuals to the personal and professional development of others. It can occur between individuals, between individuals and groups, or among groups. Some mentors may provide only personal guidance, while others provide only professional guidance. A few mentors may provide both types of guidance.

It is important that graduate students and postdoctoral fellows draw a distinction between an “adviser” and a mentor. A research adviser may or may not also be a mentor, but a research adviser is more likely to be a mentor exclusively for professional matters. Similarly for new faculty, a more senior colleague with whom you collaborate on research may or may not also be a mentor. The issue in both of these circumstances is the clear need to avoid having a mentor who has an explicit or implicit supervisory relationship with you. The danger in such situations is that the power differential inherent in the respective roles may make it too difficult to maintain the independence required to successfully perform the roles of mentor and protégé.

In all circumstances, however, the mentor’s role is to help the protégés to make informed decisions. The mentor’s role is not to make decisions for the protégé. Ultimately, the protégé is responsible for the decisions made and must bear the consequences for those decisions.

Mentors are often called upon to make explicit the tacit knowledge within a particular academic community. For example, mentors to busy undergraduates trying to balance their course work and co-curricular activities are often called upon to point out that many graduate faculty value more strongly undergraduate research than they do the difference between a 3.8 and a 4.0 grade point average. That is, if the aim is admission to graduate school, it is more in the undergraduate’s inter-

est to conduct undergraduate research and perform it well than it is

to not conduct undergraduate research in hopes of a slightly higher GPA.

Mentors are an important source of encouragement. They should well understand the challenges facing the protégé and provide (either directly or by reference to others) proof by examples that the challenges are surmountable. Often, just being a sounding board for protégés' frustrations is sufficient to keep them on the path to success. The mentor to a doctoral student should be able to explain that many of the frustrations of advancing to candidacy are important parts of acquiring the habits of mind present in successful doctoral recipients.

Mentors can advise on paths to advancement. A protégé may assume a given path is logical or consistent with their professional morés only to learn that their assumptions are completely wrong. As an example, one faculty member assumed that in his promotion package he should emphasize his collaborative efforts rather than stress his individual accomplishments. Several colleagues corrected his faulty assumption and his promotion package was successful the second time around [27].



The last example hints at the value of multiple mentors for university faculty. In the ideal situation, a protégé will have at least three mentors, with one from within the protégé's research area and department who can provide guidance and feedback on the protégé's professional growth and advancement from a

departmental perspective. This is particularly helpful in helping new faculty gain an understanding of the implicit expectations of the roles they are expected to play and the resources available to them. A protégé should also seek out a mentor from outside the department, but within the university, someone who can advise on university level "politics." There are frequently issues that extend

beyond the boundaries of the protégé's department and having an outside adviser is immensely helpful in such situations. Finally, a protégé should seek someone at another institution, but within their research area, who can provide an external perspective on professional development. This person can be immensely helpful in getting the protégés research off the ground. But this is only a minimum set. Protégés would do well to seek someone, possibly outside their professional area, from whom they can seek personal advice and guidance without having to worry about consequences for their professional image. In other words, having multiple mentors provides a variety of viewpoints applicable to different aspects of the protégé's life. Virginia Valian crystallizes this in her concept of a "circle of advisers" [30].

Particularly within academic communities, it is important to acknowledge that mentoring not only occurs as interactions between individuals, but also as interactions between individuals and institutions. When formal mentoring programs exist, their quality and operation are a statement of institutional commitment (or lack thereof) of the research group, department, college, or university to the success of protégés. Although institutions are collections of individuals, they often take on characteristics distinct from their individual members. One may find a good individual mentor within an organization that makes little formal effort to promote mentoring.

Finding mentors

Mentors can be found in a variety of ways. The direct approach can work. During the BIRS workshop, Linda Jones was approached as a possible mentor by a new doctoral graduate who was attending another meeting at the Banff Centre and who is now working as an environmental engineer at the US Environmental Protection Agency. She had decided to not immediately enter academe for specific reasons, but was seeking validation of her decision. While there was not time for a full conversation, they exchanged contact information to follow-up later.

Mentors can be found in other ways as well. They can be assigned within formal programs. (See the case study below.) When a formal program is not available, informal networks can be quite helpful. If no obvious informal network exists, then protégés can create their own networks from their professional peers and circles of interaction.

In other words, getting the mentors one wants is all about forming networks of people with various backgrounds and expertise to provide information that can be evaluated in the context of one's own life experiences.

In approaching a potential mentor, think through what is wanted from a particular mentor candidate, watch carefully to see if they can provide it, and then ask for input. If nothing else, a mentor candidate can provide a recommendation to another person better suited to either serve as a mentor or at least to



better answer the immediate question you have. At least initially, protégés may want to avoid making a formal request that someone serve as their “mentor;” many people may be intimidated by the implied responsibility that this implies. Simply view a mentor as a friend. And we can all use lots of friends. Recognize that the skill sets looked for in a mentor will likely change over time as the protégé’s personal and professional situation changes. This means that protégés may need to be on the lookout for new mentors as time goes on.

The mentors selected might not realize that they are serving as mentors. Many people give and receive advice over a period of many years without ever entering a formal mentoring relationship. Some will simply be “role models” whom protégés can watch and learn from their career paths and interactions with others. Others may simply see themselves as acquaintances with whom protégés occasionally interact.

Tending the mentoring relationship

Mentoring, at its core, is a relationship. As with any relationship, it's your responsibility to work for its success and to recognize that

there is a degree of reciprocity in any successful relationship.

Mentors and protégés should be open with each other about their expectations for the relationship. Clear communication of expectations can avoid later problems.

Just as protégés depend upon mentors for guidance, mentors need feedback on whether the advice provided is meeting the protégés' needs. Furthermore, mentors appreciate encouragement as much as protégés do. Protégés should take the time to bring your mentor up-to-date on how things are going, tell them personally or drop them a thank-you note or email when their advice works particularly well or even if it does not. Such feedback helps the mentor to calibrate their efforts and lets them build personal stories that may be helpful to others. Some mentors may not respond to their protégé's feedback. This does not necessarily indicate a lack of interest. Both mentors and protégés need to recognize that they are busy people and may simply have forgotten to follow-up.

Mentors and protégés need to recognize that the other has occasional bad days. Neither should overreact to occasional lapses in judgment or consideration. However, proper boundaries should be set within mentoring relationships. Protégés should be seeking advice, not parenting. Similarly, mentors are performing a service, not fulfilling an obligation. Brainard, Harkus, and St. George discuss common problems in mentoring relationships [5]. Among the challenges they cite are the following:

- Inappropriate choice of mentor or protégé—the mentor and protégé may simply be incompatible personally or professionally
- unrealistic expectations—the mentor and protégé need to be clear about their expectations of each other
- the expectation of protégé failure—the mentor has to believe that the protege can be successful, and
- protégé's feelings of inferiority—protégés should not be so intimidated by the mentor's professional stature that they fail to fully interact.

A mentor has to be careful not to load their protégé down with their own “baggage.” In this regard, you may wish to be careful about becoming too closely associated with any mentor you have

within your department. This caution is particularly important to protégés if their mentor is part of an on-going political battle that predates your entry into the department. As a protégé, you do not want to be inadvertently crushed in a battle between two elephants. Obviously, mentors will want to make sure that they do not get loaded down with their their protégés' baggage either.

On a cautionary note, the best way to get out of a bad mentoring relationship is to not get into it in the first place. Pay attention to the guidance provided above. However, if you do end up in bad mentoring relationship as either a mentor or a protégé, you need to get out of it. As a protégé with multiple mentors you have the option of gradually shifting your attention from a particular mentor. As a mentor, recognize that you can not save someone from themselves. You can point out the pitfalls that lie ahead, but protégés need to make their own decisions. Formal mentoring programs should allow for “no-fault” divorces.



6.2 The Benefits of Mentoring and Evaluation of Mentoring Success

Mentoring should provide benefits to the individuals involved and to the institutions of which they are a part. As individuals are helped, we should begin to see more women in doctoral programs, a larger fraction of women in doctoral programs should become faculty and those graduate student and faculty role models should inspire more female undergraduates to complete engineering programs. But these macro-level outputs may be less clear to the individuals involved. A significant challenge for individuals and organizations is the time lag inherent with the types of large scale change we seek. Asking individual mentors whether they have been successful is a lot like

asking parents to judge the success of their children—it takes many, many years and, irrespective of the result, you never really know how much is attributable to your efforts, how much is attributable to others, and how much is due to the individual characteristics of the protégé. Mentors often need an objective third party to help judge their effectiveness. Protégés may have similar difficulty in judging the results of a mentoring interaction. From organizational perspectives, similar challenges in attribution exist.

Possible metrics for gauging the productivity of mentoring relationship include those listed below in Table 6.1

6.3 Designing positive mentoring climates and institutionalizing successful mentoring practices

What policies and procedures foster and sustain good mentoring? Obviously, institutional commitment to formal mentoring programs is one step. However, others include explicitly recognizing and rewarding the time that faculty spend on mentoring activities. The National Institutes of Health has issued a policy statement that explicitly recognizes time spent advising postdoctoral fellows as an appropriate use of time on a research grant [12]. Below are two case studies that illustrate elements of a positive mentoring environment.

Case study: UMBC Eminent Scholar Mentor Program

The University of Maryland, Baltimore County seeks to facilitate a mentoring relationship between UMBC faculty and leading researchers in their fields in order to enhance awareness of UMBC faculty by eminent scholars, to receive advice from these scholars on research areas ripe for development, and to leverage their interactions with these scholars to build ties to others outside of the university in support of an expanding professional network. Through the Eminent Scholar Mentor Program (ESMP), individual faculty members consult with their chairs to identify an eminent scholar to invite to campus. Once a suitable candidate is identified, an invitation letter is sent that is signed by the department chair as well as the University's president and provost. The letter includes an invitation to present a special departmental seminar at UMBC, to meet with the

Table 6.1: Metrics for Evaluating Success in Mentoring

1. Benefits to protégé
 - (a) Graduate students
 - i. Retention in program
 - ii. Degree attainment
 - iii. Entry into faculty careers
 - (b) Pre-tenure faculty
 - i. Publications
 - ii. Teaching competence
 - iii. Appropriate level of departmental service
 - (c) Post-tenure faculty
 - i. Promotion to full professor
 - ii. Attainment of desired administrative posts
2. Benefits to mentor
 - (a) Additional professional colleague with whom to Interact
 - (b) Presence of future peer to whom one can refer other protégés
3. Benefits to Department/College/University
 - (a) Retention of female undergraduate and graduate students
 - (b) Identification of potential female hires
 - (c) High yield from hiring offers to female faculty
 - (d) Research — productive female faculty
 - (e) Teaching — productive female faculty
4. Presence/absence of institutional best practices
 - (a) Mentor training
 - (b) Other metrics such as those identified by the Council on Graduate School's Ph.D. Completion Project.

See *Ph.D. Completion Project Factor Assessment Template (Institution)* for institutional metrics <http://www.phdcompletion.org/tools/Template-FactorAssessment-Institution.pdf> and *Ph.D. Completion Project Factor Assessment Template (Program)* for program-level metrics <http://www.phdcompletion.org/tools/Template-FactorAssessment-Program.pdf>.

UMBC faculty member and chair, and to serve as host for a presentation by the UMBC faculty member at the scholar's institution. The letter explains that UMBC will pay the costs associated with the UMBC faculty member's presentation. The letter also invites the scholar to serve as a mentor to the UMBC faculty member and provides guidelines for the desired mentoring relationship.

ESMP provides obvious benefits to the UMBC faculty members involved. Many new relationships are established between UMBC faculty members and scholars at other institutions. Examples of the benefits to faculty members include invitations to attend conferences, recommendations to participate on grant review panels, and advice that proved valuable for crafting a successful grant proposal for a highly prestigious National Science Foundation Faculty Early Career Development Award. ESMP is also attractive to the department because it provides positive visibility to the department, builds connections to nationally recognized scholars, supports the success of junior faculty, and brings excellent presentations to campus.

Case study: University of Ottawa

The Faculty of Engineering at the University of Ottawa was hiring a large number of faculty several years back. The chairs were expected to provide basic orientation to new faculty, but given the large numbers of new hires, it was clear that this expectation was not being met. New faculty were lacking the most fundamental basics of orientation (e.g., the geography of the campus) and certainly were not learning about the requirements for tenure and promotion. There was a large degree of frustration. The dean instituted a one-day orientation program for new faculty where the dean, vice dean, and associate deans, as well as chairs introduced themselves and indicated their areas of responsibility and interest. The dean placed particular emphasis on communicating clear expectations as to workload and expectations of allocation of effort (e.g., teaching, research, and service). In her view, if you do not know where you going, you have very little chance of getting there. Mentorship then fills in the details provided by the expectations framework. Mentorship explains ambiguous terms like "academic upgrade standing." The questions follow once the objectives are clear and understood.

Other elements of a successful mentoring environment

One element missing from the above examples (although in the case of UMBC it is available elsewhere in the university) is formal training for the mentor in the task of mentorship. Such training can make a tremendous difference since most faculty do not receive training in mentorship. An article in *Science* [21] discusses a mentoring program at the University of Wisconsin that seeks to train mentors to communicate effectively, to consider issues of diversity, to discuss mentoring approaches, and to apply a scientific teaching approach to mentoring [21]. Surveys of participants indicate that the program achieved its goals. Such training is not only inherently important, but funding agencies are now devoting increased attention to the quality of mentoring. For example, the America Competes Act requires grant applicants to the US National Science Foundation (NSF) requesting support for postdoctoral fellows to include a description of the mentoring activities that will be provided to the postdocs, and requires NSF to review the description as part of its merit review process. The US National Institutes of Health (NIH) have also clarified that time spent providing professional advice and guidance to post-docs is an acceptable use of research time [12].

Another missing resource in many situations is a mentor broker who can connect protégés to potential mentors. An example of such a broker is MentorNet [1]. MentorNet pairs women (and some men) students studying engineering, science and math with professionals who work in industry for one-on-one mentoring relationships, conducted via email. A similar system could be developed for use by engineering graduate students and faculty. Another resource that might be adapted to the needs of engineering graduate students and faculty is the Science Diversity Center <http://sciencediversitycenter.org/>. This center is an on-line cyber center designed to broaden participation in science, technology, engineering, and mathematics fields by (a) supporting distributed partnerships among institutions, (b) developing tools for sharing promising practices, (c) offering comprehensive career development support, and (d) deploying tools to facilitate research collaboration, including brokering relationships with potential research collaborators, providing virtual meeting rooms, and listing grant opportunities.

Many universities have well developed systems for matching mentees with multiple mentors and in educating and training both to under-

stand the mechanics of mentoring and how to manage a productive mentoring relationship. Some have also initiated feedback mechanisms to evaluate the success of formal mentoring systems and continually improve them. These programs provide valuable role models for other institutions wishing to provide similar service to their student body and faculty.



Chapter 7

Outreach and Mentoring

Panel

Telle Whitney (Chair)	President, Anita Borg Institute for Women and Technology
Yolanda George	AAAS
Norman Fortenberry	NAE
Richard Ladner	University of Washington

This chapter provides advice and resources on how to spread the word on mentoring and on guides to mentoring throughout an academic career. Several concrete examples of mentoring programs are used to illustrate the issues.

Mentoring is important through out an academic career. The following sections illustrate why mentoring is important at each stage of a career.

7.1 Students

Mentoring is a key determinant of retention of women and other minorities in Computer Science and Engineering.

As an undergraduate, mentoring is important to the student of Computer Science and Engineering in order to expose them to their career options, and by providing support in making early career decisions. Another key role of mentors at the undergraduate level is attracting students to the field and reaching out to freshmen,

and keeping the students excited and engaged about Computer Science and Engineering through original teaching and outreach activities, such as technology demonstrations, service learning, and multidisciplinary research assignments. Peer mentoring is also important at the undergraduate level for recruiting new majors in their freshman year and at the high school level.

As a graduate student, mentoring is an important factor for navigating the system, and finding the right job. Research shows that graduate students who are mentored by faculty increase their academic self confidence. Graduate students with mentors are better able to finish their degree within the time



frame desired by the advisor, publish, and build a resume. Mentoring is an important part of securing the right position. Mentors help graduate students choose and build a research area and agenda and develop adequate research skills. Part of a mentor's role is to promote his or her students in job talks, award nominations, committees, and creating professional connections for the student. For graduate students, peer support and peer mentoring is an important component of mentoring and should be encouraged at the graduate and undergraduate levels, such as women's groups or other minority groups, as well as matching younger students with more experienced students.

Research shows that if doctoral students know what their milestones are, their time to degree is shorter. Experience has shown that annual reviews help streamline completion of their doctorate. As an example, one campus sends electronic forms to faculty every four months with a list of expected milestones and timeframes. To encourage faculty attention, response to these forms needs to be considered as part of faculty promotion, tenure, and salary reviews. On the <http://www.phdcompletion.org> web site there is a list of sample

questions that students should complete to track their progress.

Much of the effort with graduate student mentorship is related to making tacit knowledge more explicit. Particularly since often the tacit knowledge is made more available to some students than to others. This is the value of social groups of doctoral students to share this knowledge. Another research-based example is that students react positively to knowing that faculty struggle to solve problems too.

7.2 Junior faculty

At the junior faculty level, mentoring focuses on navigating the tenure track system. This time in their career, is especially important to the retention of women and minorities, since in Engineering, less than 3% of full professors are women, and in Computer Science, about 10% of full professors are women, suggesting a strong glass-ceiling effect in academia. At the beginning of the new faculty's career, a mentor should advocate on their behalf to get the best possible starting conditions in terms of salary, research equipment and funding, and teaching load. The mentor helps the new faculty understand departmental structures and processes and articulates the requirements and expectations for progress toward tenure, including the official and non-official requirements. Mentors and protégées should schedule frequent feedback sessions to track progression toward tenure. Of noteworthy importance is ensuring that new faculty's time is protected, and focused on research. It is not uncommon for women and minorities to be asked to serve on an unusual number of department and school committees. Mentors can encourage quality students to work with the new faculty member and provide visibility of the junior faculty to their peers. Across levels, mentors need to be aware of the additional barriers and mentoring needs faced by those who belong to more than one minority groups. These groups need additional mentoring opportunities because they experience multiple sources of marginalization. In one study, African American women faculty reported significant benefits from mentoring such as career counseling, feedback on research papers, letters of recommendation, and networking opportunities, as well as significant encouragement toward publication. At the junior faculty level, another key mentoring need is encouragement and advice on balancing

work and family responsibilities and acknowledging the competing demands of the “tenure clock” and child rearing.

7.3 Senior faculty

Even tenured faculty needs mentoring from trusted colleagues on the road to greater recognition and full professorship. The need for mentoring at this career stage is help with award nominations, opportunities for serving on prestigious committees, and recognition such as being named a member of the National Academies

7.4 Organizations for women and minorities

Informal and Formal mentoring programs are an important part of all organizations aimed at supporting and developing women and minorities. The following are a list of organizations for women and minorities.

Organizations for Women

- Anita Borg Institute for Women and Technology including the Grace Hopper Conference
<http://www.anitaborg.org>
- SWE
<http://www.swe.org>
- National Center for Women and IT
<http://www.ncwit.org>
- ACM Committee on Women in Computing
www.acm.org/women
- CRA Committee on the Status of Women in Computing
www.cra.org/Activities/craw
- Women in Engineering Program Advocates Network (WEPAN)
www.wepan.org

Organizations for Minorities

- National Society of Black Engineers (NSBE)
<http://national.nsbe.org/>
- Society for Advancement of Chicanos and Native Americans in Science (SACNAS)
<http://www.sacnas.org/>
- Society of Hispanic Professional Engineering (SHPE)
<http://www.shpe.org/>
- American Indian Science and Engineering Society (AISES)
<http://www.aises.org/>
- Tapia Conference
<http://www.richardtapia.org/2007/>

Mentornet is an organization that provides online mentoring for women and underrepresented minorities
<http://www.mentornet.net>

7.5 Mentoring research

AAAS put together a working group to review the mentoring research. The outputs from this group were a report, commissioned papers, bibliography, and a web site. What the committee found is that the most systematic mentoring work is done at the pre-college level; the level of formal workforce mentoring programs/projects is not high at the undergraduate, graduate, or post-doc levels, very little research is available on mentoring of disabled students., and mentoring for women graduate students and faculty is known to be effective.

AAAS has captured many of the resource on its web page
<http://ehrweb.aaas.org/sciMentoring/>

As a result of the study, AAAS came up with a set of recommendations for professional societies, foundations, and STEM departments.

Recommendations to Professional Societies:

- Declare a decade, year or particular week for STEM mentoring;

- Provide mentor and mentee training at annual meetings and in special forums;
- Encourage journals to publish editorials, mentoring research, essays, columns, or special issues on STEM mentoring. This might include a coordinated effort, where journals publish a special issue during the same month;
- Create a Code for Mentoring, incorporating mentoring into existing Codes of Ethics or creating guidelines that foster high quality career and workforce mentoring;
- Create board statements about the importance of mentoring that build knowledge about STEM careers and workforce skills.
- Establish mentor awards, particularly departmental mentoring awards;
- Conduct research on STEM mentoring; and,
- Incorporate mentoring in the accreditation process.

Recommendations to Foundations:

- Provide funding for research on STEM career and workforce mentoring. A single-focus program can be developed, or this topic may be incorporated into an existing grants program.
- Include grant review criteria that require applicants to present a plan for STEM career and workforce mentoring; and,
- Write a “Dear Colleague” letter to encourage awardees to pay more attention to developing STEM career and workforce skills. See example from the National Science Foundation Geosciences Directorate.

<http://www.nsf.gov/pubs/2006/nsf06038/nsf06038.jsp>

Recommendations to STEM departments:

- Appoint a departmental mentoring committee to develop and implement a departmental mentoring plan with a particular emphasis on providing students with career information and opportunities to develop workforce skills;

- Provide mentor training for faculty;
- Provide protégé training for students;
- Provide online mentoring resources or links to resources for faculty and students; and,
- Assess and provide incentives for high quality faculty mentoring.

7.6 Mentoring and the disabled student

One of the least understood areas is how important mentoring is for Disabled Students. Is there anything different about mentoring students with a disability? In general, although less common and very important, there is no difference in mentoring students with disabilities.



An example of a system that works is the “vertical mentoring” workshop for the blind developed by Richard Ladner at the University of Washington. There were 45 blind high school, college, graduate students, and professionals, and 6 Phds. All speakers were blind, all breakouts were organized by blind participants, and technology was highlighted for accessibility. “Vertical mentoring” is the same as “cascade mentoring.” Another similar example is the Academy for Advanced Deaf and Hard of Hearing in Computing in 2007 for 10 deaf and hard of hearing students. The academy taught into programming class that had an animation project as well as career building and mentoring by program staff that are also deaf. Based on his own experience, Richard Ladner found that there is no difference in mentoring a person with a disability; the focus is on helping protégés reach their potential. However there are

differences to be recognized — check on accessibility needs, be inclusive in group meetings, learn about the disability and learn that your behavior may have to change; but don't pity, don't overcompensate, and don't hide disappointment with poor performance.

Resources that are available include:

DO-IT <http://www.washington.edu/doit/>

AAAS Entry Point <http://ehrweb.aaas.org/entrypoint/>

National Center for Blind Youth in Science
<http://www.blindscience.org/ncbys/>

National Federation for the Blind

National Center for Blind Youth in Science
<http://www.blindscience.org/ncbys/>

National Association of the Deaf

7.7 Assessing participation and advancement



The 2004 Committee on Equal Opportunities in Science and Engineering (CEOSE) recommendations to the US National Science Foundation (NSF) is to expand and improve accountability of grantees on the broader participation criterion, and to design and use policies that encourage PIs

and their institutions to focus on the diversity aspects of the broader participation criterion.

Norman Fortenberry led an effort to advance the STEM community's initial response by convening a workshop to identify potential metrics for use in judging the participation and advancement of underrepresented populations and institutions in underrepresented populations and institutions NSF-supported STEM activities. Their main suggestion is to juxtapose institutionally held data with funding received from NSF to look at human resource return on NSF investment. Every recipient of federal funds has to fill out an affirmative action plan and human resource utilization report, and this is one way to evaluate how the institutions are meeting their goals. If every grantee submitted this information to NSF, then as a practical matter, the (minimal) result might be augmentation of the current "Award Summary: Top 200 Institutions" to include data on the identified institutional metric and the tracking of this information over time. Additional sample metrics offered by workshop participants that could be used by individual principle investigators include comparisons of recruitment, retention, and promotion activities, for faculty and teachers by gender and ethnicity over time, and numbers and rates of participation of students in research activities, publications, and presentations. This workshop is not an official NAE study and no report is forthcoming.

Attendees of the BIRS workshop liked the idea of "institutional audits." The idea makes sense given that you are looking at return on federal investments. Metrics that would be helpful to track is information on co-PIs, which is collected but not reported on Fast-Lane. Another question that is often not asked is who is being served by race, ethnicity, and disability. We particularly need the research directorates to report on faculty and students supported by citizenship, gender, and ethnicity. One idea to follow-up with grantees to survey past targets of the PI's efforts at "broadening participation" to see how they judge the effort received.

7.8 Mentoring in academia: References

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Chapter 8

Building a Mentoring System from the Ground Up

Panel

Sheila Hemami (Chair)	Cornell University School of Electrical and Computer Engineering CU-ADVANCE Center
Suzanne Brainard	Executive Director Center for Workforce Development University of Washington
	Tine Reimers CU-ADVANCE Center Cornell University

The intent of this chapter is to provide a “one-stop shopping guide” for individuals, chairs, or administrators who wish to implement a mentoring program at their institutions, either formally or informally. A wide variety of topics, mentoring strategies, and material intended to be especially useful to those who are starting from scratch is presented

Mentors and mentoring program coordinators should be aware of differential factors affecting women and minorities in academic engineering and science careers throughout the mentoring process.

Four case studies are summarized to serve as examples: one for students and three for faculty. A graduate student mentoring program directed by Suzanne Brainard at the University of Washington features extensive student tracking and feedback to the institution. One of the faculty mentoring programs provides peer mentoring with a speaker series, while two provide more individualized mentoring programs, with varying degrees of formality and responsibilities. Two of these mentoring programs in the College of Engineering at Cornell University supplement existing within-department mentoring programs and were faculty-initiated. A Peer Mentoring Lunch series was initiated by Sheila Hemami and is now administered and organized by the College. The second is a one-on-one mentoring program for women faculty in the College which was initiated by the senior women faculty in the College. The third mentoring program was a formal mentoring program instituted by Tine Reimers at the University of Texas, El Paso, for women faculty across the University as part of UTEP's ADVANCE program.

Finally, resources for those wishing to start a mentoring program are provided, including questionnaires, forms, and educational materials.

8.1 Differential factors affecting women and minorities in academic engineering and science careers

There are many and various factors which may differentially impact women and members of racial minority groups in the mentoring process. The discussion that follows includes issues which are statistically significant, but it is important to remember that not all women and not all underrepresented minorities (URMs) will be impacted by all of these issues or necessarily by any of them. Mentors and mentoring program coordinators should be aware of these factors throughout the mentoring process. Women and URM new faculty may be unwilling to state their needs for fear of being labeled as troublesome or uncooperative, and mentors should be forthright about asking questions of their mentees to draw out such issues if necessary.

The new faculty member may be in an emerging field or multidisciplinary area with which the senior faculty are unfamiliar. Anecdotal evidence indicates that women have a higher probability of

crossing boundaries between two fields. One example is Barbara McClintock's work on maize cytogenetics which led to her discovery of genetic transposition, for which she won the Nobel Prize in Medicine in 1983. Research in such interdisciplinary areas often has more immediate impact than research in older, more established areas, and women more than men on average prefer research problems which can provide such an immediate impact. However, evaluation of faculty who work in such areas is often difficult, as their publication record may appear strange relative to others in the same department or unit who have worked on more traditional problems firmly contained within the discipline.

Women and URMs often face a "hidden workload" because of their gender or race. They are expected to serve on more committees, to do more student advising, and to participate in more outreach activities because they are seen as representing their gender or race.

Lastly, family obligations and community expectations for service activities can be time commitments that the new faculty member values but which can sometimes be undervalued by senior faculty.

By virtue of simply being members of the non-majority, women and minorities have less access to informal networks which provide valuable mentoring and guidance. Women who do not fit into gender schemas or meet stereotypical expectations for their gender can be unfairly negatively characterized by their male colleagues. For example, women who are outspoken are labeled as "pushy" while equally outspoken men are "forthright." Women and minorities are often called upon to represent their entire gender or race, and are not seen as individuals.

8.2 Case study 1

University of Washington graduate student mentoring

The University of Washington provides a one-on-one mentoring program for students affiliated with the Center for Nanotechnology (CNT). Through the program, both students in the dual degree Ph.D. program and those with funding through certain grants are matched with faculty or industry mentors. The mentor/mentee matching is driven by student requests for what they are looking for in a mentoring relationship. Mentors and students participating in the program

include both men and women, and particular attention is directed to female students and students of color.

All students associated with the CNT are tracked through their academic progression with a series of interviews given when they start the program, at regular points throughout their time at the university, and when they leave the university. Since 2001, the Center for Workforce Development has tracked six cohorts of students through the CNT. Information that is gathered post-graduation includes information about their employment as well as their job search process. This information provides CNT with feedback about their programs.

Students associated with the CNT are also encouraged to participate in the Nanotechnology Mentoring Program (NMP), offered through CWD, in which students are matched with a faculty or industry mentor, as fits their needs. This program provides students with an alternate support network and also gives students an opportunity to interact with people who are actively using Nanotechnology in their work.

Annually, both mentees and mentors are asked to complete an evaluation. These evaluations ask about the quality of the relationship, how the mentoring relationship may have impacted the student, and the types of topics they may have discussed. The major findings of the mentoring evaluations include:

- Students were expecting to receive career guidance and to receive advice on balancing their life.
- All but one of the mentees felt that the Nano Mentoring Program had met at least some of their expectations.
- All of the mentors felt that the Nano Mentoring Program had increased their mentees self-confidence and made their mentee better able to compete on the job market.

8.3 Case study 2

Cornell College of Engineering Peer Mentoring for Junior Faculty

The Peer Mentoring Lunch series began in fall 2004, following the description of a similar series in the Stanford Civil Engineering de-

partment at the first PAESMEM workshop in June 2004. Sheila Hemami obtained a small NSF grant based on her interactions at the workshop to institute the program at Cornell. The initial goal was simply to bring together the junior (untenured) faculty (both men and women) from across the College (11 departments with approximately 250 faculty) once each month so they could share experiences and benefit from peer mentoring. After the first semester, the junior faculty requested speakers at the lunches, and the series has run approximately monthly since January 2005 with a speaker at each meeting.

Current topics include

- Preparing for the 3-year review
- Teaching and TA Management for the Large Class
- Balancing service with teaching and research
- Time management
- Graduate student development and advising
- Grantsmanship strategies

Lunchtime attendance is typically between 10 and 20 (the number of assistant professors in the College is approximately 50). Several positive outcomes from the lunch series have become evident. In spite of the size of the College, some junior faculty have been the only assistant professors in their departments. The lunches allow such faculty to develop a group of peers which is absent in their departments. Additionally, the lunches have been effective in reaching some women faculty who have not generally participated in women faculty events within the College and therefore are not using that resource for informal mentoring. The lunches allow junior faculty for whom the formal departmental mentoring is not working well to gain valuable information to which they may not otherwise have access. Lastly, since this program was institutionalized the College, the responsible Associate Dean often attends or stops by the lunches, and this has provided a mechanism by which the junior faculty can convey their concerns directly to the College administration.

8.4 Case study 3

Senior women mentoring in Cornell's College of Engineering

The women engineering faculty at Cornell - a group of size between 25 and 30 - have historically been a very proactive group both within the College and within the university. For example, this group spear-headed the writing and adoption of a parental leave policy within the college which was eventually further improved and adopted by the university (no policy existed prior to this event). It also proposed an internal grant program to incentivize the hiring of women faculty in the college of engineering which was a precursor to the NSF-funded ADVANCE programming implemented at Cornell.

This group had historically provided informal mentoring to junior women by nature of its regular gatherings, both social and to address issues of concern in the College. As such, many but not all junior women sought the advice of a senior out-of-department woman for feedback on both three-year review, tenure, and promotion-to-full professor dossier preparation. The dossier review was known to be available, but offered as a passive service to those who requested it rather than an active service through which all junior women were shepherded. As such, individuals who were uncomfortable asking for help or who simply decided against it did not receive the benefits of this service.

In Spring 2006, the senior women initiated a one-on-one mentoring program with the goal being to provide a mentor who could work closely with the mentee throughout the process leading to tenure review. This process includes preparation of the three-year review dossier, review and analysis of the reappointment letter with the mentee and guidance in developing a plan for the remaining years prior to the tenure review based on reappointment feedback, and preparation of the tenure review dossier. The preparation assistance includes detailed critiques of the CV, and teaching, research, and service statements.

To date, two promotions to associate professor with tenure have resulted from this program. At the time of writing, three more cases were under consideration, all of which were prepared with the help of the mentors.

8.5 Case study 4

Faculty Mentoring Program for Women at the University of Texas, El Paso

A campus-wide Faculty Mentoring Program for Women was developed and implemented at University of Texas at El Paso by Tine Reimers, then Director of the Center for Effective Teaching and Learning. No campus-wide mentoring program existed prior to the advent of this program, so it truly represents an effort “built from the ground up.” The intent of the program was to provide out-of-department mentoring, and it was designed to augment rather than compete with or replace intra-departmental efforts. It was redesigned several times in the course of its early years to better incorporate the successful components of the initial program and to improve upon components that did not greatly enhance the professional lives of participants.

Year 1 The initial program provided one-on-one mentoring for all incoming women tenure-track or tenured women. New faculty starting their positions at UTEP arrived to find a letter from the President of the university on their desks describing the mentoring program along with a small gift such as a mug or a pen. (As a result of this personalized invitation to join, this program had and continues to have 100% participation of the new women faculty on campus, since fall of 2000.)

In this first iteration, each woman was paired with two mentors, one from within her college and one from outside of her college. Additionally, one of these mentors was male and one was female. Monthly meetings for mentoring partners were centrally scheduled by the Center for Effective Teaching and Learning, with as many of the participants attending as it fit in their schedules. Additional communication was expected of the mentoring partners outside the formal monthly events.

The success of this program was studied extensively during the first year through monthly online questionnaires, paper surveys and focus groups. The evaluation indicated that while the gender of the mentor had no effect on the effectiveness of the mentoring relationship, the proximity of the mentor had an enormous effect. Those mentors and mentee pairs from within a college were much more likely to run into one another in the hall or parking lot, resulting in

far more meetings over coffee or casual encounters as they dropped by their mentoring partner's office. Pairs from different colleges met rarely and both mentors and mentees in these pairs indicated that they did not get very much out of their relationships due to spending such little time together.

Year 2 The program was adapted in Year 2 in response to the evaluation. Upon request by mentees and mentors, the length of the agreed-upon mentoring relationships was extended from one year to 18 months. Also, the number of mentors was reduced to one. This single mentor had no gender restriction, but was selected from inside the mentee's college (but always outside the mentee's department) to address the proximity issue. In addition in Year 2, monthly brownbag lunches for mentees only were instituted to provide peer mentoring. Evaluations from the first year indicated that the peer mentoring that took place in the monthly luncheons was so powerful that it was often perceived as being even more effective than the one-on-one mentoring that took place in those sessions.

Year 3 Program evaluation after the second year showed that certain important communication gaps existed between some mentors/mentee pairs. Mentors were unwilling to appear "pushy" when their mentees seemed to be doing well and did not insist on regular meetings. Meanwhile, mentees were reluctant to "bother" such busy people as their mentors with what seemed to them trivial questions. As a result, both mentors and mentees reported that mentoring pairs communicated less frequently than was ideal. In response to this finding, a new goal-setting workshop was developed for mentees before they even met their mentors, focusing on their professional goals as well as goals for their mentoring relationships. Additionally, a new mentor orientation was instituted to share best mentoring practices with mentors and answer any questions they might have about the relationship they were entering into. A major challenge throughout the first 5 years of the program was finding enough good mentors. Mentors were required to have demonstrated positive records in not only teaching and research, but also in character. The program experienced the well-known phenomenon that individuals who teach well, do effective research and view themselves as citizens and community builders are typically incredibly busy. This resulted in highly qualified faculty declining to participate in the mentoring program. By the sixth year of the program, women who had participated as mentees and had received tenure began to volunteer to be mentors,

which alleviated some of the difficulty in recruiting successful mentors.

Years 5 and 6 To address the dearth of good mentors and to further heighten peer mentoring, a team mentoring approach was adopted, pairing two mentors with a group of 5-6 women faculty. Again, mentors had to be from within the same college as the mentees, but from outside their departments. This approach had the merit of conserving good mentors so as to distribute a scarce resource, as well as providing peer mentoring for the mentors. The elements of monthly mentees-only brownbags and monthly luncheons for mentoring teams were retained throughout the years. By year 6, mentors were requesting additional mentor-only meetings periodically throughout the year.

Conclusion This program has emerged as a successful professional development tool for women faculty and a recruiting tool for UTEP. As a result of the program, fewer and fewer women express concern about what is expected of them for tenure and promotion or how to balance research, teaching, and service. Instead, the program began to hear comments about the value of the program and a university that would offer such a program. New hires have reported that the existence of the Faculty Mentoring Program for Women contributed to their decision to accept a position at UTEP, because it showed that UTEP takes women seriously and supports them in their professional endeavors.

8.6 Resources

Materials for mentors and mentees

These documents are for mentees and allow them to explore in what areas they would like mentoring advice, and how they would like to have conversations with their mentoring teams. A sample list of mentoring topics is also provided to jump-start their thinking.

These documents are provided to the mentees in a 1.5 hour workshop, in which they fill them out and are briefed on the mentoring program. The same documents are then provided to the mentors at a lunchtime mentor orientation to prepare them for their mentoring experience. Once confronted with the potential expectations of their mentees, mentors had many questions which were answered at the initial orientation.

Materials for mentoring relationship planning

- *Planning and Defining a Mentoring Relationship* - a document for new mentees that lists common problems and provides worksheets for the mentee to plan how to interact with a mentor or mentoring team.
- *Mentoring topics/activities* – suggested topics for the mentoring relationship.
- *Goals and reflections* and *Goals sheet for mentees* – worksheets for mentees to succinctly define their short- and long-term goals

Mentoring agreements

- *Mentoring agreement for mentor and mentee in a one-on-one program*
- *Team agreement (mentee)*
- *Team agreement (mentors)*

Mentors and mentee training

Mentoring is not a skill with which humans are born, and prospective and current mentors need information on how to maximize their effectiveness. Likewise, mentees will benefit greatly from instruction on how to effectively use feedback and how to get the most out of a relationship. A variety of materials are available for mentor training, including a curriculum for mentor and mentee training developed at the University of Washington. This curriculum is available at <http://www.engr.washington.edu/cwd/>.



Chapter 9

Feedback from Workshop Participants

Contributed chapter by
Lydia M. Contreras and Jamie Walls

There were many valuable aspects of the workshop for me. First, the wealth of information that was shared by the senior faculty at the workshop was invaluable — after just a few weeks I can already see how this new knowledge has improved my interactions with students and staff in mentoring situations. Second, the opportunity to interact with and get to know senior faculty in an informal environment was invaluable. It is comforting to know that the network of people I can ask for advice is now significantly larger than it was just a few weeks ago.

— Workshop participant

I found the experience of being able to talk about diversity and mentoring outside of my usual administrator role filled me with huge energy, enthusiasm and hope about making progress at my own institution. The frank and open conversation among people at such different stages in their careers gave new depth and richness to my understanding of mentoring. I met and learned about some individuals I would love to recruit as faculty.

— Workshop Participant

9.1 Introduction

Organization, execution, and evaluation of a mentoring program were three important topics covered during the BIRS Mentoring in Academia workshop, in particularly the session on *Building a Mentoring Program from the Ground Up*. The workshop helped to establish the fact that identifying the need to establish formal mentoring programs and setting a clear set of goals for such an endeavor is only the first step towards building a program. In addition, discussions that extended from the workshop sessions highlighted several other questions that must be addressed to create a program that will have an impact on the participants. These questions include

- how to attract mentors to the program?
- how to determine which topics to address and the format by which to present them?
- how to create an effective environment where open conversations can take place?
- how to balance the degree of formal and informal mentoring venues?
- how to evaluate the program's overall impact?

As a way to think further about these topics, we wanted to use this *Mentoring for Engineering Academia II* workshop as a case study. This specific mentoring experience (aimed to mentor on *how* to be effective mentors and mentees) was successful in bringing together a people of diverse age groups, cultural backgrounds, genders and career stages. Additionally, the workshop was able to cover a variety of topics that sparked a wide range of dialogue in a mixed formal and informal context. In this chapter, we present: (i) some of the things we were able to learn about the “behind the scene” thinking in putting this workshop together, by presenting a short interview with Bob Gray, and (ii) the feedback we obtained from many participants by means of a written survey that was drafted as a way to evaluate the short-term impact of this program.

9.2 Interview with an organizer

To gain some insight about the goals that we set for this mentoring workshop and some of the planning aspects, we talked to its organizer Bob Gray about the logistics of organizing and running it, the selection of the mentors and attendees that attended the program, the selection of the topics that were discussed, and some general aspects of mentoring programs. The full interview is presented in this section.

On the logistics of running a mentoring program

In general, we learned that the workshop's main goal, of improving the pipeline of women and underrepresented minorities, was pursued by (i) bringing together undergraduates, graduates, junior and senior faculty, academic leaders, and academic administrators to discuss this subject, and (ii) disseminating the insight gathered from these discussions. Lodging, food, and facilities were provided by the BIRS center as a result of a successful formal proposal, and travel money was awarded through an NSF proposal. (A copy of both proposals can be obtained from Bob Gray upon request.) The selection of the location was a key consideration to attract attendees, especially top academic leaders. Our questions about logistics and Bob Gray's responses are provided below.

- **What were the goals and objectives for this mentoring program?**

There were two primary goals: The first was to bring together a highly diverse group of students and faculty, with an emphasis on women electrical engineers and computer scientists, to discuss and develop a variety of issues relating to mentoring for academic academia. The second goal was to arrange for the writing of a proceedings, distilling the key ideas of the presentations and discussions, to more widely disseminate the results of the workshop.

- The workshop targeted a certain group of attendees, which would not only receive tremendous information from the workshop itself but also contribute to the information that was presented. **What was the target workshop audience?**

Undergraduate and graduate engineering students considering a career in academia, junior and middle engineering faculty who are both mentors of students and more junior faculty and protégés of senior faculty, and senior faculty, including academic leaders such as chairs, deans, and presidents.

- It is well known that mentoring programs as well as mentor-mentee experiences are key to academic and professional success. **What void did the program set out to fill?**

The percentage of women and underrepresented minorities in engineering faculty positions is far below their percentage in the general population. The workshop was aimed at improving the pipeline of potential and actual new faculty.

- Budgets, distribution of money, and the acquisition of facilities for a program of this magnitude is definitely an important aspect of planning and developing a workshop. **What issues were considered in budgeting and funding this program?**

The housing and food was provided by BIRS. We wrote a proposal to BIRS about two years ago for the workshop and they awarded us the workshop. In addition I submitted a proposal to the NSF for \$9600 to support travel for those who needed it. The NSF limited those funds to US citizens and permanent residents and to EE/CS students.

- The funding for the workshop was able to benefit largely by in-kind contributions (i.e., the BIRS station). **What was so convincing about the proposal that was submitted to BIRS?**

I cannot say why they liked the proposal past the fact that it was an important subject in an area (engineering) into which they were expanding.

- Location can be very important when looking to attract participants to any workshop, especially when targeting such a diverse set of participants. **How was the location selected?**

The original suggestion for the workshop came at a previous BIRS workshop. It is a gorgeous location, which enhances everybody's mood and talents. Beautiful places can draw major stars in the field, as this one did.

- “Timing [can be] everything” when organizing a workshop. **How did you choose the month and the length of the workshop?**

The list of topics needed at least 3 days, and the choices were 2 or 5. We added two sessions for loose ends and the proceedings, and put the free afternoon on the penultimate day. The nature of the participants (academics, mostly women) meant the best time was middle summer, outside of the academic year. In addition, this is the best time of year for Banff.

Table 9.2 is a sample daily schedule for the workshop. The first three days followed this format, the fourth day allowed for a free afternoon, and the morning of the fifth day was used for reflections and organization of tasks for the proceedings.

Table 9.1: Daily Workshop Schedule

Time	Daily Activity
7:00-9:00	Breakfast
9:00-10:30	Session 1
10:30-11:00	Coffee Break
11:30-13:30	Lunch
13:30 -15:00	Session 2
15:30 -16:00	Coffee Break
17:30-19:30	Dinner

- **How was the tempo (i.e., day-to-day schedule) of the workshop determined?**

The general principles were discussed and agreed on by the organizers. The goal was to keep sessions to 90 minutes and have lots of breaks and free time to discuss. It was also decided to have no evening sessions as the evenings would allow exploring, discussions, and relaxation. The details of the schedule were put together by me to match the Banff Center constraints on break and meal times. The tentative schedule was then sent to the other organizers and the BIRS Facilitator (Andrea Lundquist) and the schedule was then tweaked.

- Overcoming issues of intimidation that may hinder open communication is critical for a workshop of this nature. to maximize everyone's contribution. **What planning factors were considered to ensure that a safe climate for dialogue was created?**

As with our previous workshop (PAESMEM/Stanford, 2004) the goal was to have a large majority of women with a minority of men. The mix worked well at the first workshop. It had the usual population groups, but in different proportions. Everyone learned from and appreciated the different experience of either being in a majority or a minority for the first time.

- An important part of planning a workshop is selecting people that you can work well with and can rely on for help and expertise expertise. **How were the personnel and collaborators selected to assist in running the workshop chosen?**

As with the first workshop, the original organizers were me and several of my former students. This happened at the first workshop because they nominated me for the PAESMEM award, so we worked together to put the money that comes with the award to a good purpose. Rabab Ward was added because she and I ran an earlier BIRS workshop (on multimedia and mathematics). The only staff were the BIRS staff and my admin at Stanford, Kelly Yilmaz, who helped out from time to time.

- Choosing a venue for communication and delegating responsibility to the different individuals on a planning committee is an important part of organizing a workshop. **How was the work delegated to make the planning aspect more effective?**

This was done in an informal manner by constant email among me and the organizers, the organizing committee, and the session chairs.

Workshop attendees

The attendees to this workshop included undergraduate and graduate students, assistant and full professors, academic administrators, department chairs, and university deans and presidents, with a broad range of mentoring experience. (A list of all the workshop attendees is included as Appendix A). Given this diversity, we were curious to learn how this crowd was selected. In general, we learned that bringing attendees that fit mentor and mentees role was important but that formal training was not a requirement to qualify as a mentor for this workshop. Moreover, attendees were not particularly approached as “mentors” or “mentees”. Attendees were simply approached based on their interest in mentoring as a key component in promoting the roles of women and underrepresented minorities in the academy. The assumption was that the range in experience from all attendees would promote dynamic two-way mentoring relationships, where learning and teaching could both be achieved depending on one’s specific expertise. The interview continued on the subject of selecting attendees.

- Recruiting such an impressive list of attendees can be highly challenging. **How were the attendees recruited?**

This is a long story, but briefly it began by inviting some of the more enthusiastic participants in the original PAESMEM workshop and calling for nominations of more participants from them. Until the final weeks, the organizers (me, Rabab, Sheila, Eve) would make the decisions on whom to invite and we all kept contacting people for more nominations. We early agreed on a minimum of 25% students and tried

to not overload on the senior end. We did feel it important to get associate as well as assistant professors, and this time we also tried to get non-tenure track faculty. Whenever a faculty member was invited, we also asked them to suggest a student. We were successful in getting students to come with a faculty person where the student might have been reluctant to come alone.

- We were wondering if participants were selected for their ability to mentor or fit the role of a mentee. **What were the criteria of attendees fitting the “mentee” vs. “mentor” category?**

Nothing past the obvious that the most junior students are mostly mentees and the most senior mostly mentors. The hope was mentoring would go both ways.

- Formal and informal settings allow for different types of conversations and abilities to form relationships. **Did the workshop aim to bring formally-trained mentors?**

We tried to have both [‘natural’ and formally-trained mentors]. We included people like me who were never trained and did not know they were mentoring, to professional staff people who run mentoring programs. We did not assign roles, but obviously people like college presidents and school deans filled a mentor role.

- Given the participant’s busy schedules, a strong incentive must exist to attend a workshop like this. **How did you “sell” the workshop to the attendees?**

I am probably not the best person to ask. My view is that a workshop like this is a unique opportunity to interact with people the participants do not usually interact with, to learn, to teach, and to hike in this beautiful place. What is not to like? That is award enough.

- An environment that elicits honest conversation is key to a mentoring workshop. **What aspects in the planning were aimed at facilitating vertical conversations (i.e., between students and university presidents)?**

First names were used, titles were not. Dress was informal. Session schedules were loose. Breaks were plentiful and meals not rushed. People were given time to break out in small groups and do stuff.

Content of the formal workshop sessions

Given the diversity of the topics that were discussed, we wanted to learn how these topics were selected. Were they based on needs (as shown by research)? Personal experiences? Past conversations? In general, many of the topics emerged from the PAESMEM workshop. The interview continued to the subject of determining the content of the workshop.

- More topics than time can allow may need to be addressed in a workshop. This variety can challenge the decision of which topics are more important and relevant to the participants. **How were the topics selected and what strategies were used to ensure that topics were both broad and relevant?**

Many were inherited from the PAESMEM workshop, where they were developed by the organizers. New ones were added following many email exchange among the organizers and the organizing committee. We did not [make sure that the topics/discussion could be broad enough]. We thought of a good collection of topics, and some sessions diverge from the original topics [covered in the first workshop].

- Choosing presenters for a workshop is an important task, which requires looking at information about candidates and deciding if they would be able to adequately relay the information to the targeted group of participants. The ability to empower, educate and even entertain people all at the same time helps individuals to relay information in a more accurate manner. **How were the presenters for each session assigned?**

First the organizers chose the session chairs and then worked with them to find presenters. Sometimes new people were invited specifically to present, sometimes they were chosen from the existing participants.

General thoughts on the impact of the workshop

As a mentoring program, we were also interested in learning how the organizers planned to evaluate the short-term and long-term effectiveness of the workshop. We were also curious to see if they had thought of ways by which to institutionalize this type of workshop. Our conversation is reported below:

- Feedback and evaluation is an important part of an event. **How did the organizers intend to evaluate the impact of this workshop?**

No formal mechanism was originally planned, but we will get feedback as we write the proceedings.

This chapter and the interview and survey on which it is based provide a more detailed description of the impact on the participants.

- The benefits of good mentoring continue to grow far beyond a workshop and organizers would like to find ways by which to reach more people than allowed by a single workshop. **Do you intend to institutionalize this program so that it continues?**

Hmmmmm. That is not something I intend to do, but I would certainly be willing to help whoever organizes a sequel.

- **What would you like to hear 10 years from now from the attendees that will make you think “wow, this program was successful”?**

Something like what I have heard from my successful students, that they have been successful in their career and personal life and have helped others achieve similar goals. While here I had dinner

with three former students and one “almost” student (I was her second reader.) I was just amazed that I even knew such powerful, interesting, and wonderful people. The fact that they think I helped them achieve that is the best reward of my career.

9.3 Survey results

To learn about how the workshop impacted the participants’ opinions on mentoring and increasing the pipeline of women and underrepresented minorities in engineering academia, we conducted a survey. We were also interested in obtaining feedback to learn about the aspects of the conference that were successful (and not so successful). The survey was administered (and received) after the conference predominantly via e-mail. In this second part of the section, we discuss a profile of all the survey participants, present the results from the quantitative (“hard”) part of the survey, and summarize the feedback obtained from the qualitative responses that were collected. Twenty-one surveys were received from the total of 42 participants.

The self-identification of the survey respondents is summarized as follows:

- Gender: 19 females, 2 males
- Academic Position: 2 non-tenured professors, 2 non-academic, 4 academic leaders, 6 students considering academia, 3 assistant professors, 4 tenured professors
- Self-identified roles: 5 as “mentors”, 7 as “mentees,” 5 as “mentor and mentee,” 2 as workshop organizers, 2 as presenters
- Formal mentoring training: 4 said Yes, 17 No
- Travel money obtained from workshop funds: 7 said Yes, 12 No
- Travel covered by university or fellowship: 10 Yes, 9 No.

Summary of quantitative results

Table 9.2 summarizes the results of the quantitative part of the survey. To average the results, values of 0, 1, 2, 3, and 4 were assigned to

“doesn’t apply”, “poor”, “good”, “very good” and “excellent”. The table also includes the percentage of respondents in each category. It is interesting to note that the categories with the five highest ratings were

1. the ability to bring together a group with diverse experiences
2. the ability of the Banff Centre to facilitate this workshop
3. the contribution of people from diverse academic ranks to the quality of the information/discussion offered in the workshops
4. the degree to which participants enjoyed the loose/flexible schedules for all sessions, and
5. the degree to which participants enjoyed meals that were not rushed.

Summary of qualitative feedback

This subsection summarizes the responses obtained from the survey participants to some of the questions that were asked in the survey. We have also included sample quotes from the participants at the end of each section. We were interested in the participants’ feedback concerning

1. the workshop’s (at least immediate) impact for improving the pipeline of women and underrepresented minority faculty
2. ways that the workshop help to provide them *personally* with tools to address current (or expected) challenges
3. venues that made the workshop effective
4. the important factors that contributed to the workshop’s climate and the participant’s level of comfort
5. workshops that were of particular value, and
6. incentives for attending the workshop.

In general, we learned that one aspect that was extremely valuable for participants who, reportedly, enjoyed and greatly benefited from the workshop was the exchange of personal experiences and personal

stories as a complement to the formal training and factual information that was presented in the workshops. Some administrators also reported that they would like to see more strategies aimed at *how* to help and support women and underrepresented minorities.

1. What was the workshop's (immediate) impact on improving the pipeline (at the undergraduate, graduate, and junior faculty level) of women and underrepresented faculty?
 - Encouraged changes in attitudes about academic positions and academic leadership roles.
 - If already considering an academic position, helped in planning/imagining a long term career path.
 - Reduced fear in assuming the responsibilities that are associated with mentoring.
 - Exposure to both positive and negative experiences from mentors and mentees reinforced the type of mentoring that can have a positive impact.
 - Expanded notion of what "successful" mentoring can mean and how important it is to advise, not "dictate rules."
 - Increased awareness and understanding of biases that exist in search committees.
 - Provided way to extend personal network and connect to people who can help in the attempt to diversify an institution (i.e., to recruit minority faculty).
 - Informed about the value of having multiple mentors.
 - Helped to understand the importance of communicating and providing feedback to mentors (i.e., showing mentors appreciation).
 - Provoked further thought about who to consider "underrepresented".
 - Encouraged sensitivity about some of the special issues faced by underrepresented minorities through exposure to unknown information.
 - Provided concrete tools for better understanding this problem and to allow more effective conversations with those who need to be "preached" to.

- Offered concrete ideas and suggestions to increase the number of women (at that institution).
- Offered great insight into mentoring students with disabilities.
- Introduced great ideas for developing formal mentoring programs.
- Added a valuable forum to directly support young women.

Success can mean a lot of different things and that makes being a mentor seem less scary. You can start by talking about the expectations you both have and seeing if those are reasonable, etc. It's nice to know where to begin!

–Workshop participant

Prior to the workshop, I viewed “success” in a mentoring (or advising) relationship as helping the mentee achieve his/her goals and helping the mentee reach the best outcome for him/her. After the workshop, I see that this definition is only part of what a successful mentoring relationship is about. Now, I see that the mentor can also learn from the mentee.

–Workshop participant

It helped to hear about potential problems and the importance of multiple mentors. It's perhaps made me more willing to be a mentor in a situation where I realize I don't have to be the sole mentor and risk giving one bad piece of advice that could ruin someone's career!

–Workshop participant

I realized more than ever how important family issues can be for women, knowledge and support can be for the disabled, and a welcoming climate can be for underrepresented minorities. It brought home as never before the importance of institutional commitment and coordination around these issues. I also think the women leaders there have helped embolden

me!

–*Workshop participant*

2. What are the useful tools that the workshop provided to deal with current (or expected challenges) in academia?

- The exchange of personal stories and anecdotes in addition to general advice.
- The presentation of realistic advice and practical ways to apply the knowledge that was presented.
- Meeting and getting to know people to whom questions can be asked; i.e., senior women who are supportive.
- Increase of awareness and information about the challenges in the field for those in non-tenure-track or aspiring faculty positions.
- Not so helpful for administrative staff, working on faculty development.
- Raised awareness about how important mentors are for professional success.
- The opportunity provided to find mentors right at the workshop.
- Provided useful strategies about mentoring undergraduates.

The workshop helped to: Validate how I am thinking and responding to various challenges that I am facing now. Reaffirm that I am going in the right direction and that a tremendous amount of work and focus remains to be developed and completed. Understand how to use various strategies to move forward. Understand how to use various strategies to navigate through challenging situations. Understand that we are in more control than we think. Understand that keeping a focus is critical.

–*Workshop participant*

The information given was somewhere between ‘This is impossible, why would anyone choose academia . . .’ and ‘Choosing academia makes everything so

easy.’ When I hear people from the first viewpoint I wonder why anyone bothers, and the second viewpoint makes me think that the proponents are either deluded or superheroes. This workshop had lots of advice of the ‘It’s difficult but here are some ways to handle it’ variety.

–Workshop participant

What was more valuable to me was to hear the senior people talking, during the sessions and outside. I was inspired by their work. It gave me a great sense of hope to see that people can really make differences and can have a great life in academia.

–Workshop participant

3. What were the venues (informal and formal) by which the workshop most effectively impacted the participants’ personal career pathways?

- Informal venues (meals, coffee breaks, trips in the Banff area) were seen as a great opportunity to get into deeper conversations with people about specific topics of interest.
- Formal sessions and presentations were seen as a good way to get general information and concrete facts.
- Formal sessions were also seen as important precursors to powerful informal conversations.
- Some participants felt that both were necessary and useful, stating that “most of those (informal) conversations would not have happened without previously having a formal discussion about those topics during the sessions.”
- Informal conversations were a good way to network and for senior faculty and administrators to talk to the students and even do some recruiting.

The formal discussion gave an overall summary of information. I got most of my specific questions answered through informal venues.

–Workshop participant

A combination of both formal and informal methods of communication provided me with the most information. I would not have felt comfortable initiating contact with certain individuals if the formal contact did not precede the informal contact.

–Workshop participant

It was the Mentoring for Academic Leadership Workshop that made me realize that I would like to become an academic leader in the future.

–Workshop participant

Probably the most directly useful thing (in terms of what I need to get done as President of HMC) was meeting and learning about people of color who might become future faculty at HMC. This happened in the informal discussions during breaks and at meals.

–Workshop participant

4. What were the factors that contributed to creating a safe conversational climate?

- Climate of honesty, openness, trust and respect.
- Feeling that everyone was interested in hearing one another (i.e., no one got interrupted or cut off).
- Tone established from the beginning by organizers and senior leaders.
- The honesty and commitment of the facilitators that included them sharing explicit confidential statements.
- Feeling like everyone's contribution was valuable.
- Loose schedule that was adaptive and accommodating to the time-needs of each presentation and discussion.
- Mutual caring and understanding about diversity issues.
- Informal atmosphere that enabled the creation of personal connections aided by amount of spare time available during meals, breaks, small size of the room, and "loose" nature of the presentations.
- Diversity within the group.

- Session format: balance between time dedicated to discussions and time dedicated to formal presentation.
- Women being a majority.

It helped that people ‘with authority’ talked so freely from the get-go. By sharing confidences and their stories, it helped to relax the atmosphere.

–Workshop participant

The number of participants in the workshop was ideal. . . The group was small enough that I was able to meet almost everyone within the first day, but large enough that there was a variety of people with whom to talk. The group was an ideal size for the open discussion format of the formal workshop meetings, and more in-depth and specific one-on-one conversations were facilitated by the frequent coffee breaks, as well as the format of the meals and the opportunities for evening activities.

–Workshop participant

I am not sure whether the proportion of women versus men made a difference most of the time, but probably some of the themes we touched could not have come up if men had been a majority (for example, the whole conversation about crying in public)

–Workshop participant

The fact that all of us were in all of the sessions We built up a feeling of camaraderie that would have been harder to establish if we were all going to different sessions. The “boot camp” aspect of keeping everyone on the same task for a long time is very useful.

–Workshop participant

The fact that we were all housed together made this a much different experience from the original meeting and enhanced the ability for people to network better.

–Workshop participant

5. Which workshop sessions were particularly valuable?

Collectively, all of the workshop sessions were found to be of high value. However, more than the topic per se, participants commented on the value of being able to share information in two-way dialogues with people from all ranks of the academic ladder. The following comments reflect reasons why the sessions were useful for different conference participants:

I really enjoyed the conversation about how to handle crying.

The workshop on building a mentoring system was quite relevant to our graduate program as we continually strive to improve the 'graduate school experience' for all our graduate students.

The leadership workshop awoke a desire in me to become a leader.

I found the group discussions in each workshop, especially the input from the younger attendees, particularly valuable. As an academic administrator it is especially helpful to hear from junior people who are not at my institution (since junior people at my institution feel inhibited about talking to the dean or president no matter how hard I try to avoid them feeling so.

... it usually wasn't the topic but also the discussion.

I found the one on mentoring for academic leadership particularly interesting since most of the information in it was completely unknown to me. Since that session I have started to think that I might be interested in a leadership position in the future. The fact that the presenters were women to which I felt close in many ways made me feel that that might be possible.

Dr. Ladner's discussion on utilizing undergraduate research [was particularly useful] because of my interest in teaching. Dr. Riskin's discussion on empirical evidence to support diversity efforts because of specific examples I had not heard before.

6. What were the incentives to attend the workshop?

- To meet old friends, interesting colleagues, and senior researchers.
- To hear personal experiences on the topic from senior researchers and leaders.
- To enjoy Western Canada.
- To learn and hear other perspectives and new ideas about mentoring.
- To learn about the career paths of successful individuals, in particular women.
- Relevance of the content of the workshops.
- To network.
- To listen about other people's experiences.
- To share knowledge, successes, failures about mentoring and mentoring programs.
- To watch and learn from senior faculty.
- To recognize opportunities for mentoring.
- To learn how to formulate strategies on how to be a better mentee and mentor.
- To understand if "subconscious bias" really existed.
- Because it was recommended/suggested by a mentor (or professor).
- To learn about what criteria define a good individual candidate for academia.

I recognize that I have greatly benefited from informal mentoring from people more senior than myself. While I have been fortunate to have people be a mentor to me at critical times, I recognize that there

may have been other opportunities for mentoring that passed me by because I did not recognize the opportunity, and neither did the potential mentors.

– Workshop participant

Since most of my experiences as a ‘mentee’ have been rather passive, I was hoping to learn how to foster more active, or interactive, mentor/mentee relationships with senior faculty. Learning about [how to mentor] students to become productive researchers. Learning about identifying mentors and/or mentoring opportunities for myself.

– Workshop participant

I did not know enough about what the workshop actually was to make an informed decision, but I’m open to new things. And you don’t say no to opportunities from your Dean.

– Workshop participant

I wanted to pick up ideas on actions I could implement (or my University could implement) to help increase the number of female students and faculty members. I was also interested to get first hand experiences from women having either gone through or implemented such programs.

– Workshop participant

9.4 Suggestions for future workshops

Below is a list of suggestions and recommendations for future workshops.

- Best to distribute surveys during the last day of the workshop.
- Might be beneficial to see more active participation during the sessions from all the attendees (i.e., find ways to encourage those who did not contribute to participate).
- In some ways because the group was so diverse, the topics were not always of interest to the members. For example, the topic

on improving the pipeline for academics was good, but perhaps not so useful to more junior participants.

- Shorter surveys are more likely to be filled accurately.
- While the 5-day format is enjoyable during the summer, a shorter format might be more convenient (i.e., 3 days), if organized at another time in the year. ¹
- Importance of how to widely distribute the proceedings and how to encourage others to read and build on them.
- Might be beneficial to facilitate more mixing of the group over the first day or two to ensure that everyone gets the opportunity to meet. Perhaps having some assigned break-out groups, informal icebreakers (to learn names), or doing something to encourage more “mixing” during meal times in the first day or two could mitigate that.
- Informal icebreakers might also help to break the intimidation factor of meeting such famous women.
- Might be fun to have had some informal activity after dinner.
- Have more active sessions (role-playing, communication, and negotiation).

Table 9.2: Table of Survey Results

		(1)Poor	(2)Good	(3) Very Good	(4)Excellent
The ability to bring together a highly diverse group of students	3.35	0	5.00%	55.00%	40.00%
The ability to bring together a highly diverse group of faculty	3.35	0	5.00%	55.00%	40.00%
The ability to bring together a group with diverse experiences	3.71	0	4.76%	28.57%	71.43%
Degree to which the workshop provided information FOR you	3.57	0	4.76%	23.81%	66.67%
Degree to which the workshop was directed towards gathering information FROM you	2.5	0.05	5.00%	25.00%	15.00%

¹Editors’ note: the BIRS choices are two days or five days.

Success of the workshop in preparing you to better improve the pipeline for potential and new faculty	2.8	0	5.00%	40.00%	20.00%
Information gained to better prepare you to handle the challenges as potential and new faculty	3.30	0	7.69%	38.46%	46.15%
The way tasks were distributed to complete the proceedings	2.94	0	5.56%	72.22%	11.11%
The ability of the Banff Centre to facilitate this workshop	3.73	0	5.26%	26.32%	73.68%
The Banff Centre as a vacation spot (relaxing, fun, etc.)	3.85	0	5.00%	15.00%	85.00%
The quality of the food at the Centre	3.33	0	4.76%	47.62%	42.86%
The quality of the staff at the Centre	3.38	0	4.76%	42.86%	47.62%
The ability to interact with other workshop attendees during meals	3.8	0	5.00%	20.00%	80.00%
The quality of your interactions with other attendees during meals	3.52	0	4.76%	38.10%	57.14%
The ability to interact with other attendees during “coffee breaks”	3.48	0	4.76%	33.33%	57.14%
The quality of your interactions with other attendees during “coffee breaks”	3.42	0	5.26%	36.84%	52.63%
The convenience of the workshop being in the summer	3.61	0	4.76%	38.10%	61.90%
The convenience of the length of the workshop (i.e., 5 days)	2.90	0	4.76%	42.86%	23.81%
The amount of free time (i.e., “time to yourself”) during the week	3.38	0	4.76%	61.90%	38.10%
The overall quality of your stay at Banff	3.62	0	4.76%	38.10%	61.90%
The format of the workshop (i.e., presentation & group discussions)	3.48	0	4.76%	42.86%	52.38%
The gain in your understanding of how to be a better mentor/mentee during a mentoring relationship	3.3	0	5.00%	30.00%	50.00%
The tempo of the					

workshop (with lots of breaks in the middle)	3.55	0	5.00%	35.00%	60.00%
The contribution of people from diverse academic ranks to the quality of the information/discussion offered in the workshop	3.71	0	4.76%	19.05%	76.19%
Information provided to help you find mentors/mentees	2.9	0	5.26%	52.63%	21.05%
Overall quality of the session chair/moderator	3.3	0	5.00%	40.00%	45.00%
Relevance/applicability of the topics of the sessions to you	3.14	0	4.76%	57.14%	28.57%
Overall quality of the session speakers	3.33	0	4.76%	57.14%	38.10%
The quality of the discussion climate created by the women/men ratio	3.14	0.048	4.76%	52.38%	33.33%
The ability to meet new people to explore the Banff region	3.45	0	5.00%	25.00%	60.00%
The ability to engage in valuable mentoring conversations outside of the formal workshop	3.52	0	4.76%	28.57%	61.90%
The importance of sharing your experiences with other attendees in informal settings (i.e., outside of the formal workshop)	3.57	0	4.76%	42.86%	57.14%
The ability to meet new mentors/individuals that you foresee having a future impact in your career	2.8	0.05	5.00%	25.00%	30.00%
The exposure to resources about how to mentor	3.2	0	5.00%	40.00%	40.00%
The exposure to information about how to navigate through some of your current challenges	2.84	0	5.26%	52.63%	15.79%
The ability to receive broad and diverse perspectives on issues that were important to you	3.38	0	4.76%	61.90%	38.10%
Comfort achieved by the freedom to call everyone by their first names	3.58	0	5.26%	42.11%	57.89%
Comfort achieved by the casual nature of the dress					

code	3.52	0	4.76%	38.10%	57.14%
How did you like the loose/flexible schedules for all sessions	3.67	0	4.76%	23.81%	71.43%
Ability to enjoy meals that were not rushed	3.71	0	4.76%	28.57%	71.43%
Ability to have plentiful breaks	3.57	0	4.76%	42.86%	57.14%
The amount of free time (i.e., "time to yourself") during the week	3.43	0	4.76%	47.62%	47.62%

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Appendix A

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Appendix B

Mentoring Resources

This appendix collects information and planning forms described in Chapter 8. The following documents are included.

- *Planning and Defining a Mentoring Relationship*
- *Mentoring topics/activities*
- *Goals and reflections* and *Goals sheet for mentees* – worksheets for mentees to succinctly define their short- and long-term goals

Mentoring agreements

- *Mentoring agreement for mentor and mentee in a one-on-one program*
- *Team agreement (mentee)*
- *Team agreement (mentors)*

Planning for and Defining a Mentoring Relationship New Mentees

It is important to spend some time thinking about what you want out of your mentoring relationship(s). Since mentoring in this program involves perfect strangers, the most successful relationships happen when partners have thought through their definition of mentoring, and their own preferences and parameters for their relationships.

Once you have defined for yourself what mentoring means (see worksheets attached), confer with your Mentoring Partners to see whether they share your view of mentoring. Having this initial discussion with your Mentoring Team will help to avoid potential problems.

In the past, the problems that have surfaced in some of the established mentoring relationships are:

- A Miscommunication: Mentees have been hesitant to “bother” their mentors with “silly questions” when they are obviously such busy people. Conversely, Mentors who were not being asked for help did not want to interfere in their Mentee’s life by seeming pushy and thus did not contact their Mentees without express invitation. In certain cases, this concern for the mentoring partner’s freedom, time and independence lessened the impact and usefulness of the mentoring relationship for new women faculty. It is important for you to be pro-active in your relationship with your mentors so that you get what you need. Your mentors cannot begin to help if they do not know what your questions and concerns are.

- B Expectations: Mentees’ expectations for their partners can be unrealistic. One or two Mentors cannot be the only resource on every topic. Mentors should be able to admit that they do not have expertise in a particular area, but should then look for other people who might be appropriate resources on that topic.

- C Realities: Remember that we are putting complete strangers into a mentoring team. This is a somewhat artificial way of establishing mentoring relationships, and means that, through no fault of the Mentee or the Mentors, some relationships may not gel. This possibility is much less likely if you begin your mentoring relationships with a frank and honest discussion about what you want and need, and have the Mentors speak frankly about how they see the role of Mentor.

Important: as a new faculty member, you need to look for several mentors so that you get all relevant information and guidance that you need.

One—even two—mentors are not enough!

The following pages are designed to help you think through your relationship with your Mentors and mentoring teams.

Reflection:**Who I am and how that will affect how I work with my Mentoring Team**

1. Do I feel comfortable asking for advice and accepting criticism? In what contexts, if any?
2. How often and under what circumstances would I like to meet my mentoring team, communicate with my mentors?
3. Do I want to share everything with my mentors and mentoring peers or be selective about what I discuss with those people? What kinds of things do I want to share? What kinds of things seem best not to share?
4. Am I comfortable sharing personal reflections with others, or do I prefer to maintain a purely professional relationship?

Planning your mentoring Relationships*

This worksheet is designed to help you plan your relationships and guide your first meeting with your mentors and mentoring team. Please add your own items whenever you do not find them listed.

1. A mentor might be defined as
 - (a) a guide, trusted counselor
 - (b) an advocate
 - (c) a friend
 - (d) a sympathetic ear
 - (e) a resource for information
 - (f) other?

Ideally, which of these roles do I see my mentors playing for the next 18 months?

What do I see as the most useful role my peers in the mentoring team can play?

2. What types of issues do I want to discuss with my mentors and mentoring team? (Rank the topics from most important [1] to least important [10])
 - Feedback on my teaching
 - Feedback on my research agenda
 - Assistance in developing a coherent service agenda
 - Guidance in setting pre-tenure goals and preparing my tenure packet
 - Assistance in developing networks on campus or nationally
 - Balancing family obligations and my career
 - Managing my time
 - Handling conflict (in the classroom, with colleagues)
 - Dealing with departmental politics
 - Other?
3. What kinds of activities would I like to engage in with my mentors or mentoring team members?
 - Go to formal mentoring events
 - Meet over coffee, lunch or dinner
 - Go to educational events (lectures, talks, discussions etc)
 - Engage in non-academic activities (hiking, art museums, movies)
 - Other?

Faculty Mentoring Program for Women

The following list represents a compilation of activities in which past participants of the ADVANCE Faculty Mentoring Program for Women have engaged. These are merely examples of the kinds of things from which new faculty members can benefit. No single relationship, whether formal or informal, can engage in all of these activities — this is why we have increased opportunities for peer mentoring within the program.

Mentoring Topics/Activities

Research

- Read and respond to grant proposals
- Advice on establishing a publication record
- Conference involvement and selection
- Recruitment of undergraduate and graduate students
- Research group organization

Teaching

- Preparing for excellence in teaching
- Creating a teaching portfolio
- Review and design of syllabi
- Publication of education-related papers
- Work on strategies for advising students
- Classroom management

Professional Service

- Committee involvement
- Professional organization involvement Community Service
- Outreach for UTEP as an institution
- Community involvement, organizations, charities
- Neighborhood organizations

Tenure and Promotion Issues

- Prepare for third year reviews, CVs and annual merit reviews
- Create a professional file

- Communicate and explore P and T expectations

University/School/Departmental Environment and Acculturation

- Departmental funding
- Development of collegial relationships
- Associations, teams, interest groups, etc. in department or school
- Resources available at the university for faculty

Mutual interests and experiences

Family and Balance Issues

- Single and childless
- Faculty spouse
- Single parent
- Childcare responsibilities and options
- Eldercare responsibilities and options

Culture and Religion

- Local arts and music
- Churches, church groups and related activities
- Ethnic events, festivals, resources

Personal Interests

- Hiking
- Camping
- Bicycling
- Handicrafts
- Antiques
- Other

Your Goals: A Reflection

Being successful as a faculty member requires skill in teaching, research and service, as well as skill in networking with others in the department and the university. It also requires being able to balance these demands in such a way that you keep personal equilibrium and health. The following questions are designed to give you the opportunity to explore where you stand on these issues.

1. In what ways are you satisfied with your progress in personal and professional development at this point?

Professional

Personal

2. In what ways are you dissatisfied with your progress in personal and professional development at this point? What would you like to develop?

Professional:

Personal:

3. What groups/networks are you already in that help you personally and professionally?

Short-term Goals

Make two lists of those things that you need to get done in your first year at University of XXX.

Things to do for myself, my family	Things to do professionally this year at University of XXX

Concentrate on your *top* professional goal: break it down into its parts.

For example: “Establish Citizenship in my Department”

<ul style="list-style-type: none">• Meet with Chair to inform about research agenda• Have conversations with colleagues to share research ideas• Discuss teaching strategies with colleagues teaching similar courses• Join a task force or a committee important to the department (without overloading myself!!)• Recruit new students to the program• Other	
---	--

Long-term Goals

1. What questions do you have about what you need to do in the next 5 years as you work toward tenure?

2. Envision your role in the University and in the community in six years.

What are your major aspirations for how you will interact with this community? What adjectives or metaphors come to mind that describe your intended role?

What steps will you need to take to achieve such a role?

Now you have a document with which you can approach your Mentoring Team. Those who have been in a faculty position and have attained tenure should be able to help you to decide whether your timelines are reasonable, given the expectations of your College.

Developed by Tine Reimers for the Faculty Mentoring Program for Women at the University of Texas at El Paso

**University of Texas at El Paso
Faculty Mentoring Program for Women
Pilot Program**

Partnering Agreement

We _____ and _____
are voluntarily entering into a mentoring relationship, which we expect will benefit both ourselves and the University. We want this to be a rich, rewarding experience with most of our time together spent in substantive development activities aimed at our established goals. To clarify our roles, we have noted these features of the relationship:

Beyond the first year of the pilot program, how long, *ideally*, we would like to continue the mentoring relationship:

How often and in what format we plan to meet (*In office? Over coffee? For lunch? Other?*):

Approximate amount of time to be invested by the mentor and mentee (*per week or per month*):

Specific role of the mentor (*model, guide, observe and give feedback on teaching or writing etc. See the list of mentoring activities, topics and mutual interests*):

Activities the mentee engages to perform to reach her goals (*list here major goals of mentee and the smaller steps the mentee needs to accomplish to achieve those goals.*):

How we will deal with issues of confidentiality:

We understand that the following activities are a requirement of the Faculty Mentoring Program for Women:

- ✓ Sign a consent form so results of the program may be published
- ✓ Sign the partnering agreement with mentoring partner
- ✓ Establish a working relationship with mentoring partner
- ✓ Participate in mid-year focus group
- ✓ Complete a year-end program evaluation

Note: We agree to a *no fault conclusion* of this relationship if, for any reason, it seems appropriate. We understand that we may turn to our college representative or to anyone on the Faculty Mentoring Program Committee to request that we be reassigned at the end of the semester.

Mentee

Date

Mentor

Date

Adapted from Rooney, Ida, Nolt and Ahern, 1989, and Brainerd, 1998 by Tine Reimers for the Faculty Mentoring Program for Women at the University of Texas at El Paso

University of Texas at El Paso
Faculty Mentoring Program for Women
Mentoring Agreement: Mentees

Instructions: This document is intended to help you to establish effective mentoring habits with your mentoring team. Please answer the questions below in as much detail as you can. Then sign the agreement and hand it in. We will send each of you a copy, and retain a copy for the confidential Faculty Mentoring Program files.

I am voluntarily entering into a mentoring relationship with a small group of professors new to UTEP and two Mentors. I want this to be a rich, rewarding experience with most of our time together spent in substantive development activities aimed at our established goals. To clarify my roles, I have noted the following features of our work together:

Beyond the first 18 months of the program, how long, ideally, would I like to continue working together? *[Note: please note down your wishes here. Circumstances and needs may change over time, and they may alter the answer to this question.]*

In what format do I plan to meet with Mentors? *(In office? Over coffee? For lunch? By email individually? As a group? Other?)?*

In what format do I plan to meet with other members of the Mentoring Team *(In office? Over coffee? For lunch? Other?)?*

Please turn to next page →

Our team will attempt to meet at least _____
 (enter # of meetings by time period— i.e. week, month, etc. Meetings may include email discussions, in-person meetings of the team, or other options your team designs.) If I cannot attend a scheduled meeting, I agree to notify my partners in advance whenever possible.

What do I see as the specific role of the Mentors? (models, guides, observers and sources of feedback on teaching or writing etc. See the list of mentoring activities, topics and mutual interests)

[Note: this is an opportunity for Mentors and Mentees to express their definitions of mentoring and their wishes for these activities. Some negotiation and compromise may be necessary to answer this question. **Mentors cannot be everything to everyone!**]

What are the activities I, as Mentee, engage to perform to reach my goals? What are my responsibilities in the mentoring team?

Confidentiality: any sensitive issues that we discuss will be held in confidence. Issues that are off-limits in our discussions will include:

I understand that the following activities are a requirement of the Faculty Mentoring Program for Women:

- ✓ Sign the mentoring agreement that guides my work with my mentoring team
- ✓ Establish a working relationship with the mentoring team for a period of 18 months

Please turn to next page →

I understand that to help the Faculty Mentoring Program improve, it is important to

- ✓ **Participate in the mid-year focus group**
- ✓ **Complete a program-end evaluation**

I understand that to make it possible for the Faculty Mentoring Program to publish results, I am asked to

- ✓ **Sign a consent form that details the confidentiality of any information we provide**

Note: I agree to a no fault conclusion of my mentoring relationship with any member of my team if, for any reason, it seems appropriate. If one of us needs to terminate the relationship, we agree to abide by the decision of our partner(s).

Mentee

Date

University of Texas at El Paso
Faculty Mentoring Program for Women
Mentoring Agreement: Mentors

Instructions: This document is intended to help you to establish effective mentoring habits with your mentoring team. Please answer the questions below in as much detail as you can. Then sign the agreement and hand it in. We will send each of you a copy, and retain a copy for the confidential Faculty Mentoring Program files.

I am voluntarily entering into a mentoring relationship as a Mentor with a small group of professors new to UTEP and another Mentor. I want this to be a rich, rewarding experience with most of our time together spent in substantive development activities aimed at our established goals. To clarify my roles, I have noted the following features of our work together:

Beyond the first 18 months of the program, how long, ideally, would I like to continue working together? *[Note: please note down your wishes here. Circumstances and needs may change over time, and they may alter the answer to this question.]*

In what format do I plan to meet with Mentees? *(In office? Over coffee? For lunch? By email individually? As a group? Other?)?*

In what format do I plan to meet or communicate with the other Mentor? *(In office? Over coffee? For lunch? Other?)?*

Please turn to next page →

Our team will attempt to meet at least _____
 (enter # of meetings by time period– i.e. week, month, etc. Meetings may include email discussions, in-person meetings of the team, or other options your team designs.) If I cannot attend a scheduled meeting, I agree to notify my partners in advance whenever possible.

What do I see as my specific role as Mentor? (model, guide, observer and source of feedback on teaching or writing etc. See the list of mentoring activities, topics and mutual interests)

[Note: this is an opportunity for Mentors and Mentees to express their definitions of mentoring and their wishes for these activities. Some negotiation and compromise may be necessary to answer this question. Mentors cannot be everything to everyone!]

What are the activities I expect the Mentees in my team to engage to perform to reach their goals? What are their responsibilities in the mentoring team?

Confidentiality: any sensitive issues that we discuss will be held in confidence. Issues that are off-limits in our discussions will include:

I understand that the following activities are a requirement of the Faculty Mentoring Program for Women:

- ✓ Sign the mentoring agreement that guides my work with my mentoring team
- ✓ Establish a working relationship with the mentoring team for a period of 18 months

I understand that to help the Faculty Mentoring Program improve, it is important to

- ✓ Participate in the mid-year focus group
- ✓ Complete a program-end evaluation

I understand that to make it possible for the Faculty Mentoring Program to publish results, I am asked to

- ✓ Sign a consent form that details the confidentiality of any information we provide

Note: I agree to a no fault conclusion of my mentoring relationship with any member of my team if, for any reason, it seems appropriate. If one of us needs to terminate the relationship, we agree to abide by the decision of our partner(s).

Mentor

Date