

MENTORING-IN-A-BOX: Women Faculty in Computing

Activities Guide

This guide addresses issues academic women face in the higher education institution, and provides promising practices in career advancement and guidance. Select activities to help your mentee increase her competence, vision, and success in academia. Use these activities as they are written or as a springboard for ones that suit your unique situation.

Activities are organized into the following themes:

1. Success in Academia
2. Time Management and Work-Life Balance
3. Women in a Male-Dominant Field
4. Teaching and Interacting with Students
5. Becoming an Accomplished Researcher
6. Career Advancement
7. Communications and Collaboration

1. SUCCESS IN ACADEMIA

Use these activities to build institutional awareness and fundamental professional skills.

Identify Institutional Support

Your mentee may not be aware of department and university resources for faculty. Consider these activities for building her awareness:

- » With your mentee, make a list of workshops and other faculty trainings offered by the department and university. Strategize about which ones will contribute to her professional growth at this stage in her career.
- » A survey of NCWIT member departments shows that mentoring is practiced at 81 percent of post-secondary institutions that attempt to improve women's representation in computing. Find out whether formal mentoring is available at your institution, and how your mentee can participate. *Mentoring-in-a-Box* complements formal mentoring programs: offer it as a resource that other program participants might use.

- » Help your mentee identify funding sources that pay for travel and registration for conferences or workshops. Discuss planning a travel calendar and choosing which events to attend, including how to find funding sources for each trip. [Note: A potential pitfall for junior faculty is actually “over-attending” conferences, at the potential expense of publication productivity.]
- » Recommend ways to secure institutional support or other program support for time-off to work on special projects, as well as funds for equipment.

Identify Sources of Information

Instead of acting as a “short-cut” to easy answers for mentees, teach self-sufficiency. If your mentee asks about basic employment policies or other readily available information, teach her the most effective ways to acquire the information on her own.

Explain “Unwritten Rules”

How often have you thought, “If only I’d known that back when!” Share unwritten rules about the department, institution, and field, such as:

- » *Expectations.* The department or its members may have unstated expectations for any number of things, ranging from travel during the semester to how courses are assigned, how equipment is used, or how email is sent. Point out these norms to your mentee so that she can navigate her new environment more quickly.
- » *Institutional culture.* Educational institutions often have an identity that is reflected in their culture and language. For example, the University of Virginia takes very seriously the values and intentions of its founder, Thomas Jefferson. This emphasis results in practices such as avoidance of the title “Dr.” for faculty because if “Mr.” was good enough for Jefferson, it is good enough for the faculty here. Discuss the traditions and culture of your institution to help your mentee avoid embarrassing faux pas.

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- » *Networks.* Point out information and social networks among your colleagues – who goes out for lunch together, who recreates together, and who collaborates on research and publications. Recognizing networks minimizes awkward social situations, makes broadcasting and acquiring information more effective, and generally improves access to resources. Advise your mentee to use existing networks as she makes contacts, establishes her presence, and builds her own network. Help your mentee with this task by providing background information on other faculty and introducing her to people in the relevant social and professional networks on your campus.
- » *Professional norms.* Examples might include: What is appropriate apparel at your institution for teaching, or for campus events? Casual clothing may be the norm, but advise junior faculty members to dress in ways that make them appear more seasoned and accomplished. Point out colleagues who seem always to dress and groom themselves appropriately: they can serve as models.
- » *Key individuals.* Help your mentee identify the most productive faculty and those who are advancing in their careers. Your mentee can learn from watching and interacting with these colleagues. Give her tips for observing them and point out the behaviors that play a part in their success. Whose contributions are given serious consideration in meetings? What are their communication strategies? Who chairs important committees? How do they prepare, and how do they guide group processes? Who is active in professional organizations or is editor of a leading journal? What skills and personal qualities do these activities call upon?

Promote Selective Reading

Your mentee may benefit from help with identifying or prioritizing sources of information for the discipline and institution. Use these strategies to focus her attention:

- » Share tactics for critical reading. Discuss ways to find time for reading, and methods for keeping up with the field.

- » Recommend that she join or start a discussion group for her area of research.
- » Together, host a brown-bag lunchtime session where all faculty members discuss what they are reading as well as their methods for staying abreast of developments in the field.

Encourage Other Forms of Continuous Learning

A junior faculty member might not be aware of her opportunities to learn, or understand the importance of continuous learning in an academic's life. As a mentor you should model continuous learning behavior. Talk about conferences or symposia you attend and what you learn. Discuss what you read. Discuss how your colleagues support each other's learning through colloquia, seminars, and casual discussion. Invite your mentee to join you in these formal and informal learning opportunities.

Prepare for Meetings and Annual Reviews with the Chairperson

Help your mentee prepare for meetings with her chairperson. Discuss the likely agenda, and assist her in preparing topics she wants to raise. If she expects that some aspects of this meeting will be challenging or uncomfortable, rehearse possible interactions. Advise your mentee to take notes during the meeting, and offer to review these with her later. Together you can identify meeting outcomes that need her attention and plan how she will respond to them.

Assist with Hiring Students and Others

Advise your mentee on strategies for hiring and supervising students and post-docs. Discuss selection criteria and offer to participate in the hiring process the first time through. Note that poor student assistants can be more trouble than no student assistants. Advise on how to assign tasks and review work, and how to give critical feedback and praise.

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2. TIME MANAGEMENT AND WORK-LIFE BALANCE

Junior faculty are expected to manage a combination of duties including teaching, research and service. To do so effectively and still have a personal life, they will have to manage their time very carefully. These activities will help your mentee with both time and attention to matters important to her career.

Balance Multiple Responsibilities

Encourage your mentee to track her actions in a calendar – not just meetings, but periods spent reading, advising, doing research, engaging in service to the university. Once she establishes a baseline, help your mentee evaluate where her efforts are going proportionately. Ask her to consider: *Are you performing critical tasks most of the time? Are you engaged in one type of activity more than you should? As you seek tenure or promotion, are your activities building your record in strategic ways?* If realignment of effort is in order, advise your mentee how to do this, and if necessary, how to approach these issues with her chairperson.

Time Management Tips

Research or scholarship is usually the top priority in an academic's work life. Ensure that your mentee's time allocation reflects that priority, and that she is devoting some time each day to writing a research paper or grant proposal. This steady effort will keep up production of publications and funding, while minimizing last minute rushes before deadlines.

Learn from Others

Together, identify people in the department who seem to successfully manage a busy home and work life. Introduce your mentee to those who have experienced and overcome challenges similar to those she faces.

Leave Policies

Explain any parental and family leave policy and the option of stopping the tenure clock. Identify faculty members who have navigated these waters and seek their advice.

3. WOMEN IN A MALE-DOMINANT FIELD

Women's minority representation in computer science creates particular challenges. These activities support women's efforts to overcome these challenges.

Support Discussion of Research

According to research on faculty in science, technology, engineering, and mathematics, men are more likely than women to engage in face-to-face conversations where their research activity is supported, tested, and updated in face-to-face interactions (Fox, 1991).

Mentors can promote this activity by encouraging and supporting their mentees in:

- » Making connections and inviting discussion. When you talk with colleagues let them know how your mentee's research connects with theirs. Introduce your mentee to colleagues by pointing out these connections.
- » Listening as your mentee practices elevator talks (two-minute talks) about her current research questions, challenges, and results.

Make the Most of "Equity" Service

Given her minority status, a woman in computing may be asked to serve on many committees or boards in order to promote gender balance. Advise your mentee to choose assignments that serve the school or profession in the most significant ways and, when possible, align closely with her professional goals. Help her practice saying "no" to requests that do not meet these criteria.

Practice Negotiating Compensation When Saying "No" Is Not a Viable Option

Some thankless service just goes with "junior" status. Coach your mentee to be selective when she can, and to negotiate for help or a lighter load in other areas when she cannot refuse. She has her career to look out for and has the right to protect her time.

Encourage Visible Contributions

Even as she says "no" to some appointments, your mentee can

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build a reputation as a contributing faculty member by stepping up to take on important tasks. Advise her to take on positions that have influence and offer visibility. Advise your mentee to:

- » Pick critical assignments – that is, assignments that bring her together with senior faculty or assignments that develop useful new skills or knowledge. Avoid committees that have no product.
- » Host or participate in informal brown-bag lunches to discuss new research.
- » Be a connector – Bring together individuals from other departments or institutions for discussions or planning a research project.
- » Lead the way – show off an emerging technology that may benefit others. Younger faculty members often know how to use new tools better than anyone. Would a wiki serve a committee's planning efforts? Your mentee might be the best person to set it up and teach others to use it.
- » Celebrate publicly – when it's time to celebrate accomplishments, name and thank everyone who contributed. If a party is in order, invite senior faculty and the dean.

Boost Participation in Meetings

As a minority, women may need to exert their presence to be heard in meetings. Encourage your junior colleague to show her expertise and state her views. Recommend these tactics to increase participation, presence, and effectiveness in meetings.

- » Together, review the agenda for an upcoming meeting. Discuss strategic ways to prepare and participate.
- » Advise your mentee that it is appropriate to be a critical thinker who evaluates – and sometimes even challenges – ideas others bring up in a meeting. Discuss ways to be assertive without giving offense.
- » Advise your mentee to listen carefully and limit her speaking to critical contributions. Suggest that when she speaks in a meeting, she references statements made by

others. This acknowledgement shows she is paying attention and connecting ideas.

- » Consider how to tactfully retain credit for her ideas when they are attributed to someone else. Women's comments are often overlooked or credited to other meeting participants. If her contributions are overlooked, your mentee should have strategies for reminding others without seeming petty.

4. TEACHING AND INTERACTING WITH STUDENTS

Teaching is an important part of academic life. It is the means for attracting and preparing the next generation of practitioners and scholars, if it is done well. Like any skill, teaching can be learned and honed to increase effectiveness and personal reward.

Balance Teaching Assignments

Help your mentee negotiate appropriate and fair teaching assignments. Help her:

- » Seek classes that integrate her into the department, and that are in her research area to facilitate recruiting students.
- » Minimize teaching large service courses, the most unpopular courses in the curriculum, or too many new or different courses. Over time, it is good to build breath in types of courses – large and small, introductory and advanced. Initially, however, your mentee should repeat courses to keep preparation time under control.
- » Recommend the target of two hours prep time for each hour of class after a course has been taught once (Boice, 2001). This information will help her gauge whether she is under- or over-preparing.

Don't Reinvent the Wheel

Help your mentee approach more senior faculty to share course materials (syllabi, homework sets, lecture notes, etc.) so she does not have to reinvent courses from scratch. She can seek helpful advice on the delivery of the course at the same time.

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Strategize Ways to Manage a Predominately Male Class

Discuss how to manage a predominantly male class in which a female instructor may be challenged more than a male instructor would be. Strategize firm but non-defensive responses to questions about your mentee's expertise, and ways to head off any such challenges. For example, a well-respected senior faculty member might introduce your mentee to the students and describe the qualities and qualifications that make the department feel lucky to have hired her. Bestowing credibility in this way might reduce the number of challenges.

Communicate with Students

Students may expect women faculty to behave in ways that fit gender stereotypes and if women faculty violate those expectations, course evaluation penalties can result (Collins, Chrisler & Quina, 1998). Expectations based on stereotype (for example, that women faculty will be more nurturing) can encourage behaviors such as student attempts to dispute grades or seek deadline extensions. As you discuss course management and student behavior, be sensitive to your mentee's need to negotiate these gendered expectations and advise her on strategies for communicating firmly but fairly with students.

Take a Close Look at Teaching

As a junior faculty member, your mentee likely has room to grow as a teacher. These activities will help her become an accomplished instructor.

- » Visit your mentee's class. Meet beforehand to discuss the mentee's plans and the aspects of the class she particularly desires feedback on. After the observation debrief the class with her and discuss pedagogy.
- » Invite the mentee to sit in on your class and discuss what went well and what could be done differently. Arrange for the mentee to observe other good teachers as well.
- » Encourage your mentee to use variety in class activities, including some active learning. Two examples: The Minute Paper is a simple technique that can have a transforming

effect on teaching. The instructor stops class with a few minutes to go and asks the students to respond to two questions anonymously: "What was the main point in today's class? What was the muddiest point?" After class, the instructor reads the responses and looks for trends in the muddy points to provide a starting point for the next class period. *Short in-class team assignments* (less than 5 minutes each) can break up lectures and provide opportunities for interaction with and among students and do not take much time to plan or implement.

- » Suggest a mid-semester informal evaluation of her classes. Help your mentee interpret and act on results with an appropriate "course correction with this course and this set of students.
- » Direct the mentee to good books or other resources about teaching, such as McKeachie's *Teaching Tips*, *A Berkeley Compendium of Suggestions for Teaching with Excellence* at <http://teaching.berkeley.edu/compendium> or archived documents and book excerpts at the Tomorrow's ProfessorSM Listserv sponsored by The Stanford University Learning Laboratory, <http://sll.stanford.edu/projects/tomprof/newtomprof/index.shtml>.

Integrate Research

Help your mentee integrate research interests appropriately into lectures. Students should be aware of their professors' scholarship. Your mentee may find students to help with her research and her enthusiasm about the topic will make the class more exciting to both her and the students.

Interpret Teaching Evaluations

Put teaching evaluations into context by 1) noting areas of strength as well as those in need of improvement, and 2) comparing evaluations of similar courses or the same course taught by a different instructor. Plan ways to improve both your mentee's teaching and her evaluation results. For the latter, suggest strategies such as never asking for evaluations just after an exam.

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5. BECOMING AN ACCOMPLISHED RESEARCHER

Based on research about gender differences in graduate education (Fox, 2001), new women faculty are less likely than their male peers to have experienced a collegial relationship with their advisor and tutoring on professional skills. As a result of having had less advice and support, they may especially benefit from mentoring about research.

Keep Up with Rapid Change

Because change is so rapid in computing, teach your mentee to keep up with research in progress. Waiting for papers can be too slow, so it is useful to track grant awards in your research area, and then communicate with the principal investigators to learn about their progress and results. Help your mentee learn to keep up with rapid changes in technical knowledge by targeting a new language, skill, or topic that interests you both. Alternatively, trade expertise with each other by sharing knowledge, key papers, or skills.

Communicate Effectively about Research

Help your mentee find opportunities to present research at conferences and symposia.

- » If an application is required, show her samples of successful applications you have submitted, and help her write her first.
- » Let her practice her presentation with you. Help with visuals.
- » Coach her on the best ways of communicating about science, as described in the following tips from Pritchard (2006):
 - *Avoid Generalizations.* When talking to other scientists, too many generalizations may give the impression of being either unsure of the topic, holding back information, or unwilling to collaborate. Help your mentee talk about her research and the context for it with the right amount of detail.
 - *Vocabulary not Jargon.* Any discussion about research involves technical language. Help your mentee use the vocabulary of the discipline but avoid jargon

and acronyms, especially when speaking with an interdisciplinary or lay audience.

- *Deep Knowledge.* Preparing to speak includes anticipating what people will want to know. Work with your mentee to anticipate follow-up questions, and plan responses.
- *Awareness of Limits to Knowledge.* Help your mentee feel comfortable acknowledging where understanding leaves off. Speculating on new avenues of research is intellectually challenging and can foster rich discussion.
- *Protect Unpublished Work.* Advise your mentee on how much to share. If she is not ready to share unpublished data or a paper she can let listeners know when it will be published.

Increase the Chances for Accepted Papers

Discuss rankings and characteristics of journals and conferences. Help your mentee decide where to submit her papers, and how to adjust her writing for her target audience. Recommend the best ways of getting feedback on a paper prior to submission while protecting her unpublished research.

Explore Research Funding Strategies

Help your mentee obtain research funding in these ways:

- » Include her in joint research projects with other faculty
- » Introduce her to the campus grants office and library staff members who can help her investigate grant opportunities. Also introduce your mentee to grant program directors, and advise her on best ways to interact with them.
- » Encourage your mentee to submit several proposals per year. (For help with writing successful proposals, see Darnell 1996, Sullivan et al. 1996, and Reis, 1997).
- » Advise your mentee to keep in mind the priorities of funding agencies. Likewise, she should keep in mind that multi-institution, collaborative proposals are more likely to be funded by agencies such as the National Science Foundation.

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Support Proposal Development

When your mentee begins submitting grant proposals, help her with the process in these ways:

- » Show your mentee successful and unsuccessful proposals and talk about the review process.
- » Offer to review her work in progress and share your own.
- » Help your mentee engage critical readers to review proposals before submission. Several readers may be appropriate, each reading for a different purpose.

Engage Students in Research

Encourage your mentee to get engaged early on with quality undergraduate and graduate students. Good students will be critical in helping her perform research and build her program. The better the students affiliated with your mentee's work, the quicker she can become successful.

6. CAREER ADVANCEMENT

According to data from the Computing Research Association, approximately 60 percent of women faculty members in computer science at research institutions are tenured. In contrast, approximately 72 percent of the men faculty members are tenured.

Bring Clarity to Tenure and Promotion Guidelines

When you start your mentoring relationship, review the expectations for promotion from your mentee's level and ask your mentee questions about her career goals. Examples: *What do you want to accomplish? What interests you most about teaching, research, and service? What research topics excite you most? What steps will you take to meet or exceed these guidelines?* Set immediate and long-term goals based on your discussion.

Plan for an Ironclad Tenure Case

Request that your mentee roughly outline her career plan leading up to tenure. Include a timeline. Critically evaluate it together and suggest additions/subtractions or changes in emphasis, if needed. Advise your mentee to perform at the highest level of accomplishment

so she does not put people in the awkward position of having to judge a marginal tenure case. By meeting the top end of expectations, she will leave no room for doubt.

Keep Watch over the Curriculum Vitae (CV)

Have your mentee bring a copy of her CV to a meeting early on and intermittently thereafter, and suggest changes in emphasis if needed. Consider her CV in relation to her written career plan.

Discuss Factors that Influence Tenure

Factors that influence tenure may vary from one institution to another, but may include: 1) number of publications and prestige of the journals, 2) number of grants, 3) number of students advanced to candidacy and graduated, and 4) impact of research on the field.

Learn Expectations

Identify the decision-making body that acts as the real filter in the tenure process and talk with a member of that group to learn about current expectations.

Examine Strong Cases

Obtain and review recent tenure cases that had positive outcomes for information about recent expectations.

Record Accomplishments

Encourage your mentee to maintain a file documenting her activities and accomplishments in teaching, research, and service. This practice can simplify writing annual reports and preparation of her tenure dossier. She may get suggestions about content from the school's tenure and promotion committee. Elements may include her CV, letters of support or acknowledgement, internal or public announcements that credit her, and other examples and hallmarks of her work.

Contribute to the Department, Institution, and Profession

Recommend strategic choices that fulfill service requirements and serve the greater good while at the same time building visibility, status, and professional growth. Encourage your mentee to:

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- » Choose committee posts that have the greatest impact.
- » Choose committee posts that align with her professional goals.
- » Serve in contributing roles, and then leadership roles in a professional society. She could begin by serving as a reviewer for conference and journal papers, and for grant proposals.

Over time, your mentee should head a special-interest group, sit on an awards jury, or serve on a conference program committee. Through these actions she will give service back to the profession while staying abreast of developments in her field, expanding her professional network, and building her professional reputation and that of your institution.

Assist Your Mentee with Applying for Early-Career Awards

The NSF Faculty Early Career-Development Program is the most prestigious NSF award for new faculty members. Awardees are selected on the basis of their plans to develop highly integrative and effective research and education careers. The award aims to increase participation of under-represented groups in science and engineering. Additional awards for young faculty include the Young Investigator Awards and the Presidential Early Career Award for Scientists and Engineers.

Nominate Your Mentee

Nominate your junior colleague for any applicable awards at the department or campus level or in her particular specialization. Have her draft nomination letters for herself as practice for her tenure file and for nominating others.

Nominate Your Mentee to Be a Speaker

Help your mentee build her presence as a presenter at national or international conferences, and as a colloquium speaker at prominent universities. It is important that her work be known widely, if for no other reason than to obtain letter-writers for her tenure case.

Open Doors

You have connections within and without the institution. You

developed a network and trust with others. Bring your mentee into that circle. When you introduce her, give her credibility by endorsing her; note some of her qualifications and characteristics that will lead to her success.

7. COMMUNICATION AND COLLABORATION

Although stereotypes portray women as naturally talented communicators with preferences for collaboration, research indicates that men speak more than women about their research and that men's informal networks lead to collaborations more often than women's do (Fox, 2006). As a mentor, you can help your mentee develop communication skills and practices that will advance her career in academia.

Discuss Communications Strategies

Discuss institutional norms and issues around email and personal communications. For example, is email accepted as a discussion forum among faculty, or is this practice perceived as time-wasting and inappropriate?

Consider ways gender and cultural background and stereotypes may influence interactions in your mentee's professional life. Together, strategize ways to work through or around impediments and maximize all interactions.

Notice Norms around Topics of Conversation

Norms about topics such as sports or family vary over time and across institutions. Take note of whether highly regarded faculty members discuss their personal lives at work. In general, it is probably best to limit reports on children, parents, or partners to informal times such as walking together for coffee, or to colleagues who express an interest. Inappropriate or excessive focus on personal matters could create the impression of not being a serious professional.

Practice Effective Communication Skills

Communication involves both talking and listening, but effective communication emphasizes listening actively. Practice effective communication as a means for improving your mentoring relationship and to help your mentee in her interactions with

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colleagues and students. Here are some adapted tips from Larry Nadig, Ph.D., but there are other sources you could use for advice on communication:

- » When you speak, be sure that you are loud enough to be heard and that your message is not obscured by too many details or too much complexity. Keep your body language in concert with your verbal message, e.g. do not smile when you are angry.
- » When you listen, do not assume that you understand what the person is saying. Listen until they have finished speaking and then paraphrase back your understanding of the message. Consider the intent of the words in addition to their surface meaning.
- » Use eye contact, lean toward the speaker, and nod your head appropriately.
- » Be respectful and try to understand the speaker's view. Paraphrasing your understanding of what is being said without being critical can make apparent any flaws in an argument. By attempting to understand and avoiding defensiveness, both the speaker and listener can learn from the exchange.

Identify Opportunities for Collaboration

Help your mentee identify key researchers in her specialization with whom to collaborate, both in the department and on other campuses. Help her communicate how her expertise contributes uniquely to the collaboration she seeks. Coach her in the best ways to engage accomplished collaborators.

Stretch beyond the Familiar

People tend to gravitate to one another based on common age, gender, life phase, or position, but this practice may not be the best strategy for learning and connecting widely. Encourage your mentee to step outside her comfort zone and actively build diverse networks as she makes choices about with whom she carools, does lunch, or seeks advice. Introduce her to members of your own network who have different demographic characteristics but similar research interests or personalities.

NOTES:
