Multidisciplinary Research
Mentor Training Seminar
For Faculty Mentors

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UW-MADISON INSTITUTE for cross-college BIOLOGY EDUCATION

DELTA Integrating Research, Teaching, and Learning

NSF

Wisconsin Program for Scientific Teaching University of Wisconsin - Madison

THE UNIVERSITY of WISCONSIN MADISON

Multidisciplinary Research Mentor Training Seminar for Faculty Mentors

Course Objective: Seminar participants will work with a community of peers to develop and improve their mentoring skills. By the end of the class, participants should be able to clearly articulate a personal mentoring philosophy to anyone inside or outside their discipline, and have multiple strategies for dealing with mentoring challenges.

Content

The content of each session in this curriculum is designed to address the key concerns and challenges identified by research mentors. The topics include:

- Establishing Expectations
- Maintaining Effective Communication
- Assessing Understanding
- Fostering Independence
- Addressing Diversity
- Dealing with Ethics

Many people have a much easier time talking about topics such as expectations or communication style than they do talking about issues of diversity and power hierarchies. People who use this guide are encouraged to explore issues of diversity and power dynamics in *all* activities because these issues can often be a subtext for miscommunication, misunderstanding, and conflict in mentoring relationships.

This *multidisciplinary* curriculum is not discipline specific and is designed to be used with faculty mentors from a variety of disciplines. Much of the content of this seminar is adapted from *Entering Mentoring: A Seminar to Train a New Generation of Scientists*, created by Jo Handelsman, Christine Pfund, Sarah Miller Lauffer, and Christine Pribbenow, with support from the Howard Hughes Medical Institute Professors Program (PI: Jo Handelsman). A PDF version of the book is available at: *www.hhmi.org/grants/pdf/labmanagement/entering_mentoring.pdf*. The original, biology-focused *Entering Mentoring Seminar* materials were adapted for use across science, technology, engineering and math through the Delta Program in Research, Teaching, and Learning with funding from the National Science Foundation (Grant # 0717731; PI: Christine Pfund). This adaptation process involved a full collaborative effort between faculty and staff from Astronomy, Biology, Chemistry, Engineering, Math, Physics, and Psychology. The process was supported by existing NSF funded projects at the University of Wisconsin-Madison including the Midwest Alliance, Wisconsin Alliance for Minority Participation (WiscAMP), Interdisciplinary Graduate Education in Research Training (IGERT), Center for the Integration of Research Teaching and Learning (CIRTL), Nanoscale Science and Engineering Center (NSEC) and Undergraduate Research and Mentoring (URM).

Format

Experiential learning and facilitated discussion form the structural foundation of this research mentor training seminar. The content and process are based on the experiences of faculty and staff who have implemented the mentor training seminar at the University of Wisconsin-Madison. These seminar facilitators have learned that the best results come from keeping an open discussion format to allow participants to integrate their diverse experiences into the course materials and activities. In order to accommodate the unique idiosyncrasies of each mentor-mentee relationship, this seminar focuses on core principles that apply broadly across disciplines. Simply asking the mentors a few guiding questions typically leads to vigorous discussion. The case studies and reading materials can provide a tangible starting point, and the mentors will often move quickly from the hypothetical examples to their own experiences mentoring graduate and undergraduate researchers.

Implementation: Facilitating the Seminar

Facilitating the Research Mentor Training Seminar is not the same as teaching it. Your role as facilitator is to enable the seminar participants to take ownership of their own learning by helping them to engage in self-reflection and shared discovery and learning. Your role in the group is to get others to work through their thoughts and ideas---it is not your role to be the expert on mentoring. As a facilitator, you may also walk a fine line between facilitator and participant, but remember that the group members will look to you for guidance and structure. Your own experiences and ideas should enhance the discussion but should not dominate and become the focus of the discussion. Being an effective facilitator is the key to helping the research mentors in the seminar meet the learning objectives and become more successful mentors. To assist you in your own facilitation abilities, we have included a brief facilitator guide in the next section which contains additional information, tips, and tools for facilitation.

Implementation: Specific Issues for Faculty Mentors

Based on the experiences of facilitators and participants in the Research Mentor Training Seminar for Faculty Mentors, the composition and timing of the seminar need attention. Early career faculty members are likely to benefit a lot from the seminar, and it is useful to revisit the seminar after a few years. Some find it most useful to participate in the seminar for several semesters in a row to keep the material fresh in their thoughts. It is helpful to have perspectives from both junior and senior faculty as well as participants from a variety of disciplines. Be mindful of the power dynamics between faculty within a given department or college, and discourage participation of departmental mentoring committee members with the junior faculty. Arrange the meeting times every two to three weeks and consider changing the venue. One idea might be to hold the seminar at the lab spaces of different participants. Summer seminars tend to be challenging to schedule because of faculty travel plans.

Implementation: Using this Guidebook to Facilitate Weekly Sessions

The weekly session plans provide some ideas for how to address the themes and objectives for each session. However, with faculty mentors participants, you will likely find that they have their own issues and experiences that they will bring to the seminar. Encourage participants to bring their challenges and ideas to each seminar meeting. Be mindful of keeping the discussion constructive and draw attention to the themes and objectives that can support the discussion.

You can prepare for each session by copying the readings, descriptions of session themes and learning objectives, case studies, and any worksheets for each mentor in the group. Alternatively, all of the materials can be copied at the start of the seminar and distributed at the first meeting or posted on a course website. The specific themes and objectives for each session are included at the beginning of the seminar materials. Detailed notes for group facilitators are included in each session plan with time estimates for activities and facilitated discussions indicated in parentheses and can be adjusted at your discretion. The facilitator notes provide directive signposts (e.g., ACTIVITY, TELL, ASK, NOTE, DISCUSS), to support the facilitation process. “ACTIVITY” indicates that participants are to engage in some process on their own, in small groups or as a large group. “TELL” means that the information that follows needs to be shared with the whole group. “ASK” means a specific question or questions needs to be put to the group. “NOTE” means that some particular issue or content needs to be emphasized. “DISCUSS” means that a broader discussion, usually supported by guiding questions, needs to occur. Sometimes more discussion questions are provided than can reasonably be addressed in the time allotted for the activity or group discussion. The questions suggested for the case studies in this seminar are based on experiences of those who have facilitated the seminar in the past. A “Reflection and Notes” space is provided for you to make your own notes for next time you facilitate the session. You can find additional questions for the case studies, as well as additional case studies, at the “Build Your Own Curriculum and Workshops” section of the “Curriculum Options” tab at www.researchmentortrianing.org.

Multidisciplinary Research Mentor Training Seminar
Facilitation Guide

Role of Facilitators

- **Make it safe:** Take time to tell the group members that the seminar is a safe place to be honest about their ideas and feelings. Everyone's ideas are worth hearing.

- **Keep it constructive and positive:** Remind members of your group to keep things positive and constructive. Ask the group how they want to deal with negativity and pointless venting. Remind them that the seminar is about working together to learn, not complaining about the current situation or discounting the ideas of others in the interest of a personal agenda.

- **Make the discussion functional:** At the start of each session, explain the goals of the session to the group. Try to keep the group on task without rushing them. If the conversation begins to move beyond the main topic, bring the discussion back to the main theme of the session.

- **Give members of the group functional roles and responsibilities:** Assign or ask for volunteers to take notes, keep track of time, and report out in the larger group at the end of the session. Functional roles help keep participants engaged.

- **Give all participants a voice:** In a group, there are likely to be issues of intimidation and power dynamics that can play out in ways that allow certain members of the group to dominate and others to remain silent. At the start of the conversation, mention that the group is mixed by design, and point out that a diversity of perspectives is an essential part of the process. Remind group members to respect all levels of experience. It's important that everyone's voice is heard!

General Notes on Facilitating a Group*

Each group will take on its own feel and personality based on the people in the group, the facilitator's approach, and a whole host of external factors beyond your control. It helps if you adopt a "no fault" clause that states that if a group is not working well, it is through no fault of a single individual, but rather a set of circumstances. It's hard to not take it personally if someone drops out or if a group doesn't function well, but remember, you are just one part of the whole dynamic. Remember, you are a facilitator, not a teacher; and the people enrolled in the seminar are participants, not students.

It also helps if you are able to release your expectations for how a meeting or group "should" go, and instead focus on the core aspects of the process. Your role as facilitator is to be intentional and explicit while remaining flexible and not overly prescriptive. You can only do so much as a facilitator – to a large extent it is up to the participants to take ownership of their own learning, especially since this seminar is designed for adults who already have advanced degrees. Individual ownership, self-reflection, and shared discovery and learning are where the deepest learning will occur for this particular type of program.

As challenges and normal group dynamics surface, the group will look to you to "fix" the problem. But part of your role is to help others see that they are responsible for the "fixing" also. You can help them realize this by holding on tightly to the following core ideas of group dynamics (and periodically reminding the team of them):

- Respectful interactions are essential (listening, non-judging, non-dominating, genuine questioning, etc.) are a must.

- Relevant tangents that tie back to central topic/issue/question are fine, but don't let them derail the central purpose of the discussion.

- You need to keep moving ahead, but there is no need to push the schedule if it seems the group needs time to reflect or slow down. (If you slow down or skip something, you can anticipate that participants will feel as if they are "behind" or missing out, so reassure them this is normal and the initial schedule is only a guide and there will be time to revisit topics if needed.)

- If you try something and it doesn't go well, don't abandon it right away. Step back and think about what went wrong, talk to the group, learn from it and try it again. You may need to try something a couple times to get the group warmed up to something new.

- Discomfort and silence are ok, but with a clearly stated context and purpose. Silence may seem like a waste of time in meetings, but it gives people a chance to think, digest, and reflect. Allow for a few silent breaks before, during, and at the end of a meeting.

- Make it easy, rewarding, and fun for people to participate, and encourage others to do the same for each other. Simple things like friendly reminders of meetings, coffee, and follow-up calls to check in with someone if they miss a meeting, can send the message that you care, and make it easier to participate.

* Adapted from the Creating a Collaborative Learning Guidebook, Center for the Integration of Research, Teaching, and Learning http://www.cirtl.net/CCLEguidebook.pdf

Group Dynamics:
Suggestions for How to Handle Challenges

What do I do when no one talks?

- Have everyone write an idea, thought, or answer to a question on a piece of paper and toss it in the middle of the table. Each participant then draws a piece of paper from the center of the table (excluding their own) and reads it out loud. All ideas are read out loud before any open discussion begins.
- Have participants discuss a topic in pairs for 3-5 minutes before opening the discussion to the larger group.

What do I do when one person is dominating the conversation?

- Use a "talking stone" to guide the discussion. Participants may only talk when holding the stone. Each person in the group is given a chance to speak before anyone else can have a second turn with the stone. Participants may pass if they choose not to talk. Importantly, each person holding the stone should share his or her *own* ideas and resist responding to another person's ideas. Generally once everyone has a chance to speak, the group can move into open discussion without the stone.
- Use the "Constructive/ Destructive Group Behaviors Exercise. Each participant chooses their most constructive and destructive group behavior from a list (see following page). Each person writes the two behaviors on the back of their table tent. Each participant then shares their choice with the larger group and explains why she chose those behaviors.

What do I do when the group members direct all their questions and comments to me, instead of their fellow group members?

- Each time a group member talks to you, move your eye contact to someone else in the group to help the speaker direct his or her attention elsewhere.
- Ask the participants for help in resolving one of *your* mentoring challenges. For example, ask them for advice on how to deal with an apathetic undergraduate researcher. This helps the group members stop looking to you for the *right* answers and redirects the problem-solving and discussion to the entire group.

What do I do when a certain person never talks?

- Have a different participant initiate each day's discussion so that different people have the chance to speak first during the week.
- Assign participants in the group different roles in a scenario or case study and ask them to consider the case from a certain perspective. Ask the participants to discuss the case in the larger group from the various perspectives. For example, some participants could consider the perspective of the mentee while others consider the perspective of the mentor.
- Try some smaller group discussions (2-3 participants per group) as the person may feel more comfortable talking in the smaller group.

What do I do when the group gets off topic?

- Have everyone write for 3 minutes about the ideas they want to share on a given topic. This short writing time will help participants collect their ideas and decide what thoughts they would most like to share with the group so they can focus on that point.
- Ask someone to take notes and recap the discussion at the half-way and end-point of the session to keep the conversation focused.

Constructive and Destructive Group Behaviors*

Constructive Group Behaviors

Cooperating: Is interested in the views and perspectives of the other group members and is willing to adapt for the good of the group.

Clarifying: Makes issues clear for the group by listening, summarizing and focusing discussions.

Inspiring: Enlivens the group, encourages participation and progress.

Harmonizing: Encourages group cohesion and collaboration. For example, uses humor as a relief after a particularly difficult discussion.

Risk Taking: Is willing to risk possible personal loss or embarrassment for the group or project success.

Process Checking: Questions the group on process issues such as agenda, time frames, discussion topics, decision methods, use of information, etc.

Destructive Group Behaviors

Dominating: Takes much of meeting time expressing self views and opinions. Tries to take control by use of power, time, etc.

Rushing: Encourages the group to move on before task is complete. Gets "tired" of listening to others and working as a group.

Withdrawing: Removes self from discussions or decision making. Refuses to participate.

Discounting: Disregards or minimizes group or individual ideas or suggestions. Severe discounting behavior includes insults, which are often in the form of jokes.

Digressing: Rambles, tells stories, and takes group away from primary purpose.

Blocking: Impedes group progress by obstructing all ideas and suggestions. "That will never work because…"

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*Adapted from Brunt, J. (1993). Facilitation Skills for Quality Improvement. *Quality Enhancement Strategies*. 1008 Fish Hatchery Road. Madison WI 53715

Multidisciplinary Research Mentor Training Seminar for Faculty Mentors Syllabus

Sessions	Topics	Assignments Due	Readings
Week 1	**Exploring Experiences of Being a Mentee** **Seminar Process and Logistics** **Developing Mentoring Compacts** **Getting to Know Your Mentee**		
Week 2	**Introductions & Check-in** **Review seminar logistics** **Case Study: Expectations** **Communication and establishing expectations check-in**	Draft a written compact agreement that you could give to your mentees/postdocs when they first start in the lab. It should outline your expectations for them as students or researchers.	National Academy of Sciences, (1997). "What is a Mentor?"
Week 3	**Assessing Understanding & Fostering Independence**	A description of your mentoring philosophy	
Week 4	**Mentoring Challenges and Solutions**	Bring in copies of your own case study to share with the class (or be prepared to present one verbally)	Handelsman, Pfund, Miller Lauffer, & Pribbenow, (2005). "Mentoring Learned, Not Taught."
Week 5	**Addressing Diversity**	Reflection on differences and how they affect the research experience	Fine & Handelsman, (2005). "Benefits and Challenges of Diversity." Crutcher, B.N., (2007). "Mentoring across cultures."
Week 6	**Dealing with Ethics**	Look over the general ethics guidelines for your discipline Be prepared to talk about how they apply to you and your work. Bring a copy of them to class.	Lee, Dennis, & Campbell, (2007). "*Nature's* Guide for Mentors."
Week 7	**The Elements of Effective Mentoring**	Summary of your mentor's response to a mentoring challenges	
Week 8	**Developing a Mentoring Philosophy**	Revised mentoring philosophy or mentoring compact	

Readings

National Academy of Sciences, (1997). "What is a mentor?" in *Adviser, Teacher, Role Model, Friend: On Being a Mentor to students in Science and Engineering*, (pp. 1-16). Washington, DC: National Academies Press.

Handlesman, J., Pfund, C., Miller Lauffer, S., & Pribbenow, C.M., (2005). "Mentoring Learned, Not Taught" in *Entering Mentoring: A Seminar to Train a New Generation of Scientists*, (pp. 52-64). Madison, WI: University of Wisconsin Press.

Lee, A., Dennis, C., & Campbell, P. (2007). *Nature's* Guide for Mentors. *Nature, 447*, 792-797.

Crutcher, B.N., (2007). Mentoring across cultures. *Academe, 93*, 44-48.

Fine, E., & Handelsman, J. (2005). Benefits and Challenges of Diversity in *Entering Mentoring: A Seminar to Train a New Generation of Scientists*, (pp. 71-81). Madison, WI: University of Wisconsin Press.

Paulus, C.J., Horth, D.M. & Drath, W.H., (1999). *Visual Explorer: A Tool for Making Shared Sense of Complexity.* Center for Creative Leadership Press. Found at *http://www.ccl.org/leadership/index.aspx*

Multidisciplinary Research Mentor Training Seminar
Session 1
Getting Started and Project Design

Objectives

Mentors will:

- Explore their perceptions of the research mentoring relationship in their own and across disciplines
- Become oriented to the process and expectations for the seminar sessions

Core Activities

Exploring Experiences of Being a Mentee
Seminar Process and Logistics
Developing Mentoring Compacts
Getting to Know Your Mentee

Participant Materials

Table tents and markers
Copies of syllabus
Copies of examples of research mentoring compact agreements

Assignments for Next Session

Write a first draft of a mentoring agreement that outlines expectations for graduate students and post-docs working in your lab.
Read "What is a Mentor?" (National Academy of Sciences, 1997)

FACILITATOR NOTES

Core Activities

- Exploring the Experience of Being a Mentee (15 min)
  - ASK: Ask participants to reflect upon an experience they have had as a research mentee.
    - What did the experience teach you about doing research in your discipline?
    - What did you think about your mentor then? What do you think about your mentor now?
  - Have participants introduce themselves around the room and describe their experience of being a research mentee.

- Introduction of Seminar and Logistics (15 min)
  - TELL: Provide participants with details about the seminar process and logistics.
    - Expectations for attendance and participation
    - Plans for where seminar will meet. Encourage meetings at different sites to visit participants' labs
    - How readings and assignments will be distributed and collected
    - Confidentiality is important to the seminar and everything discussed in seminar or on the course website will remain confidential. Be particularly mindful of creating a safe and confidential environment for junior faculty who are untenured.
    - How to document participation in the seminar for funding agencies and future grant applications
    - The seminar is designed for mentors actively working with a mentee. If that's not the case, participants can use their past experience in the discussions and adapt the assignments to plan for future mentoring relationships.

- Large Group Discussion about goals for the seminar (15 min)
  - ASK: What are the personal and professional goals people would like to achieve through participation in the seminar? Are there any collective goals for the group?
  - WRITE: Make sure to write the ideas generated on the board or a flip chart

Wrap-up

Assignments for next week (5 min)

- Write a first draft of a mentoring compact that you could distribute to graduate students and pos-docs working in your lab.
- Reading: "What Is a Mentor?" and example mentor-mentee compacts.

Reflection and Notes

Welcome to the McMahon Lab!

The broad goals of my research program

As part of my job as a professor, I am expected to write grants and initiate research that will make tangible contributions to science, the academic community, and to society. You will be helping me carry out this research. It is imperative that we carry out good scientific method, and conduct ourselves in an ethical way. We must always keep in mind that the ultimate goal of our research is publication in scientific journals. Dissemination of the knowledge we gain by conducting experiments is critical to the advancement of our field. It is also important that we present our work at scientific meetings, so that other researchers are aware of our progress.

What I expect from you

Another part of my job as a professor is to train and advise students. I must contribute to your professional development and progress in your degree. I will help you set goals and hopefully achieve them. However, I cannot do the work for you. In general, I expect you to:

- Learn how to plan, design, and conduct high quality scientific research
- Learn how to present and document your scientific findings
- Be honest, ethical, and enthusiastic
- Be engaged within the research group and at least one program on campus
- Work hard – don't give up!
- Treat your lab mates, lab funds, equipment, and microbes with respect
- Take advantage of professional development opportunities
- Obtain your degree

Getting the science done

I expect you to make steady progress towards your research goals at all times. Part of that process includes being active in setting short and medium term goals including milestone dates and deliverables. During the academic semester, performing well in your courses is certainly important, but should not cause a complete lack of productivity. This is your primary responsibility as a research assistant and the following guidelines are intended to support this responsibility.

An important part of conducting scientific research is keeping pace with the work of other scientists. Learning to use the literature review tools to locate relevant articles and then reading those articles will not only provide you with valuable research skills, but will also guide your research to ensure it can be an original contributions. Finally, reading other people's published work will lead to improved writing skills. A goal of reading one publication per month is a good minimum standard. We will periodically run journal clubs to help achieve this goal, but journal club should not be a substitute for reading on your own within your specific area of research.

Communicating your work to others

Journal publications are the most important way to share your knowledge and creativity with the rest of the scientific community. Students pursuing a Masters degree will be expected to author

or make major contributions to at least one journal paper submission. Students pursuing a doctoral degree will be expected to author at least two journal papers submissions.

Conferences are another important venue for sharing your findings with others. Although the availability of travel funding varies over time, I encourage you to submit your work for presentation at least one conference per year. Travel fellowships are available through the Environmental Engineering program and the University if grant money is not available. I will help you identify and apply for these opportunities.

Collaborations within the group and beyond
As part of our collaborations with the Center for Limnology and other research groups, you will often be using equipment that does not belong to our lab. I ask that you respect this equipment and treat it even more carefully than our own equipment. Always return it as soon as possible in the same condition you found it. If something breaks, tell me right away so that we can arrange to fix or replace it. Don't panic over broken equipment. Mistakes happen. But it is not acceptable to return something broken or damaged without taking the steps necessary to fix it.

I also expect you to respect your fellow students, and the staff in the department. Part of your professional development is to learn how to work with others and resolve conflicts. Again, I can help you with this. If you feel that you have been treated unfairly by another student or a staff member, please come to me to help resolve the conflict.

Obtaining your degree
It is your responsibility to determine the requirements for your individual graduate program. Depending on the program, this information is available in student handbooks, on websites, or through departmental student services staff. I can help you find these resources but you must take the initiative to make sure all requirements are met on time in order to advance in your degree (e.g. for preliminary exams).

Professional development
UW-Madison has outstanding resources in place to support professional development for students. I expect you to take full advantage of these resources, since part of becoming a successful engineer or scientist involves more than just doing academic research. You are expected to make continued progress in your development as a teacher, as an ambassador to the general public representing the University and your discipline, with respect to your networking skills, and as an engaged member of broader professional organizations. The Graduate School has a regular seminar series related to professional development. The Delta Program offers formalized training in the integration of research, teaching, and learning. All graduate programs require attendance at a weekly seminar. Various organizations on campus engage in science outreach and informal education activities. Attendance at conferences and workshops will also provide professional development opportunities. When you attend a conference, I expect you to seek out these opportunities to make the most of your attendance. You should become a member of one or more professional societies such as the Water Environment Federation, the American Society for Microbiology, or the American Society for Limnology and Oceanography. For more information about professional development opportunities, check our lab website and talk with me for guidance.

Vacation
Your research assistant appointment does not include any formal vacation, sick, holiday or other leave. That said, you are permitted to take a reasonable amount of time for all of these purposes. Approximately two weeks of vacation per year is considered reasonable. As a professional, you should consider how much additional vacation time will interrupt your ability to make progress with your research.

What you should expect from me

You should expect me to **be available for regular meetings** (once a week or every other week). At these meetings we will talk about what you have done lately in the lab, or what you have read. I will do my best to answer questions that you have, and help you solve problems that you experience in your research. Research is not easy. There are many pitfalls and many failures. You will quickly learn that most of your experiments will not work. That is perfectly normal. It is my responsibility to be your cheer-leader and help keep you excited about your work. Only with perseverance will you generate high quality results.

You should expect me to help you learn to **present your work**. I will probably ask you to prepare a poster or a presentation for at least one scientific meeting while you are in my research group (in reality, this ends up being at least one per year). It will be my responsibility to help you put it together and practice presenting it. Similarly, I will help you learn to write about your research, mainly by providing feedback on drafts of your thesis and papers.

You should expect me to **be your advocate**. If you have a problem, come and see me. I will do the best I can to help you solve it.

My primary role in the lab is to write grants and bring in money so that you can do your research with as much freedom and flexibility as possible. I serve as an **advisor** in your research, offering guidance and advice. Together we will design a research project tailored to your interests and the objectives tied to the funding that is supporting your work (if applicable). I will also support you in your professional development activities.

Yearly evaluation

Each year we will sit down to discuss progress and goals. At that time, you should remember to tell me if you are unhappy with any aspect of your experience as a graduate student here. Remember that I am your advocate, as well as your advisor. I will be able to help you with any problems you might have with other students, professors, or staff.

Similarly, we should discuss any concerns that you have with respect to my role as your advisor. If you feel that you need more guidance, tell me. If you feel that I am interfering too much with your work, tell me. If you would like to meet with me more often, tell me. At the same time, I will tell you if I am satisfied with your progress, and if I think you are on track to graduate by your target date. It will be my responsibility to explain to you any deficiencies, so that you can take steps to fix them. This will be a good time for us to take care of any issues before they become major problems.

I look forward to working with you!

WELCOME TO THE INGHAM LAB

Our lab conducts applied research designed to aid small and very small meat processors with HACCP implementation and process validation. Our work in the area of meat safety supports the 300 (+) small meat processors located in the state of Wisconsin; we also support meat processors from other states who look to the University of Wisconsin for scientific decision making within a HACCP system. At any time, our lab group is generally composed of academic staff, graduate students, and undergraduate researchers – all important members of our research group.

EXPECTATIONS - In order for our group to function effectively, I will expect each of you to:

Be a team player – This means being respectful of the workspace and efforts of everyone in the lab. Everyone has a lab 'job,' this might be autoclaving lab coats or mopping the floor. You are expected to do your part to keep the lab functioning. There are times when the equipment that we have available will be stretched thin; we'll all have to do our best to make sure everyone is accommodated. Mistakes happen and equipment stops working. It's everyone's responsibility to notify me when something needs fixing. You are expected to participate in all-lab meetings and to support others in the lab through shared insight.

Develop strong research skills – One of the true advantages of working at a world-class university is the chance to develop strong research skills. I expect that everyone will learn how to plan, design, and conduct high quality scientific research. You will all be given the chance to present your work at meetings and seminars, and you will be challenged to prepare scientific articles that effectively present your work to others in the field. You will join at least one scientific organization and keep up with the literature so that you can have a hand in guiding your own research. The 'currency' of a campus such as this is published papers, they are the engine that drives a lot of what we do and you will be pushed to publish. Papers will be published as you move through your degree program, <u>not</u> only at the end. At the beginning, preparing manuscripts for publication will be a joint effort (I may write as much of the article as you do); as you move towards the end of your program, you will be expected to take a lead role in authoring scientific papers. There may be times when you will be asked to help another student with their project; or to mentor/train another student. This is good experience! Undergraduates working in the lab are expected to contribute to the writing of manuscripts. If you are paid, your hourly rate will be tied to your contribution to a finished paper.

Work to meet deadlines – Lab work and progress will be managed by deadlines. These deadlines can be managed in a number of ways, but everyone is expected to work their best to meet/manage those deadlines. Deadlines will be set at one-on-one meetings at the beginning of each term. These deadlines will be mutually agreed upon. For graduate students, there is to be a balance between time spent in class and time spent on research. As long as you are meeting expectations, you can largely set your own schedule. Graduate students can expect to work an average of 50 hours per week in the lab/office at work; post-docs and staff at least 40 hours per week. All travel plans, even at the major holidays (Christmas), should be OK'd before any firm plans are made.

Communicate clearly – Everyone is new to a process/procedure at some point in their career. Questions will be gladly addressed up front. If you have a style of communication that you prefer, email versus a weekly meeting, please let me know! No single style is expected to work for everyone; no one style is expected to work all the time. Everyone <u>is</u> expected to respond promptly to emails from anyone in the group, to show up on-time for meetings, and to be prepared to take notes.

WHAT YOU CAN EXPECT FROM ME - I will work tirelessly for the good of the lab group, and have the success of the group as a top priority. Specific things that you can expect from me:

You should expect me to be **available for regular meetings and informal conversations**. At our scheduled one-on-one meetings (every week or every other week) we will address questions or concerns that you have. It is my responsibility to help you succeed and I can do that best if I know what you are doing! For regular meetings, you are asked to share research data roughly 24 hours in advance of a meeting so that I have time to look at it and prepare. If you need to miss a meeting, it is your responsibility to reschedule; I will show you the same courtesy. I will generally be available from 7 am until 4 pm daily; and often will be in at work on the weekends. Email is a great way to communicate with me! If my door is open, feel free to stop by. I will be happy to see you and do what I can to help.

You can expect me to do my best to **promote you (as a scientist) and your work**. I will do my best to help you in your professional development and in your efforts to communicate your work. I will work tirelessly to adequately fund our program and to disseminate its results. I will do my best to provide timely review of your research. My primary role is to bring in grants, largely based on the work that you do!, and to steward our resources so that we all benefit to the maximum extend from our joint efforts.

You can expect me to try my best to be **understanding of your unique situation**. Each student comes from a slightly different background and has a slightly different situation. I will do my best to be understanding of your individual circumstances. It will help if you keep me informed and remember that graduate school is a job with commensurate expectations.

Example from a UW-Madison graduate student mentor

Expectations for all undergraduate mentees:

1. **Send me weekly e-mail updates by Fridays at 5 pm** describing briefly what you've been working on, what you plan to do the following week, and any questions or troubles you had. Important things to include: project you've worked on, broken equipment, storage/equip conflicts, if your data look weird.

2. **Attend lab meeting.** The entire lab assembles approximately once a week to discuss our research. Generally, the person leading lab meeting will distribute reading materials in advance. You should read these materials and come prepared to participate actively in the discussion

3. **Be organized.** There is a lot of overlap in projects, and it is essential that you keep track of all of the samples in the way that I specify. This includes updating the data spreadsheets and lab notebooks immediately.

4. **Read background information and protocols about our projects, and about the McMahon lab research.** This includes the protocol handout, the Wiki, and related journal articles from the lab that I've suggested. I'd love to discuss any journal article or protocol, so just say the word and we'll grab some coffee and chat.

5. **Be consistent with your lab schedule.** E-mail/call me if you are going to be Very Late or unable to make your scheduled lab time.

6. **Be independent.** I am periodically away, and I expect you to get things done well without me. Ask questions when I am around, but don't be afraid to try to do detective work on your own if I am not. We have a helpful, experienced lab so know that folks other than me may be excellent resources.

7. **Respect the lab area and your colleagues.** Keep it neat and ask if you have questions on equipment use, cleaning, etc. It is very important that you tell me if a piece of equipment breaks. Do not be worried that I will be angry. These things happen all the time in labs and the important thing is that I know it is broken and can arrange to have it fixed.

8. **Let me know if you need anything from me as a mentor, or if you have questions.** Be up front and I will do the same.

9. **I have an "open door" policy.** Let me know if you hare having troubles or concerns that you want to talk about with me, work related or not. My phone number is XXXXXX.

Multidisciplinary Research Mentor Training Seminar
Session 2
Establishing Expectations and Effective Communication

Core themes and Objectives

Expectations

One critical element of an effective mentor-mentee relationship is a shared understanding of what each person expects from the relationship. Problems between mentors and mentees often arise from misunderstandings about expectations. Importantly, expectations change over time so frequent reflection and clear communication about expectations are needed on a regular basis.

Learning Objectives for Expectations:

Mentors will have the knowledge and skill to:

- Establish expectations and clearly communicate them to the mentee
- Design and communicate clear goals for the mentoring relationship
- Listen to and consider the expectations of their mentee in the mentoring relationship
- Assess the mentee's knowledge and skill level and adjust the project design accordingly
- Consider how differences may affect the relationship

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Communication

Good communication is a key element of any relationship and a mentoring relationship is no exception. As mentors, it is not enough to say that we know good communication when we see it. Rather, it is critical that mentors reflect upon and identify the specific characteristics of effective communication and take time to practice communication skills.

Learning Objectives for Communication:

Mentors will have the knowledge and skill to:

- Foster open communication with the mentee
- Address how difference in communication styles, background, position of power, etc. can alter the intent and the perception of what is said and heard
- Use multiple strategies for improving communication.

SESSION OUTLINE

Activities

Introductions & Check-in

Review seminar logistics

Case Study: Expectations

Communication and establishing expectations check-in

Participant Materials

Table tents and markers (or table tents from previous week)

Copies of description and learning objectives for Expectations and Communication

Copies of *Expectations* case studies: *Balancing Research and Teaching* and *High Maintenance Mentoring*

Assignments for Next Session

Write a description of your mentoring philosophy.

FACILITATOR NOTES

- Introductions (10 min)
  - ASK: Please remind everyone who you are and share one word or phrase that describes the typical research mentoring experience in your discipline.
  - Check-in: Any particular challenges or experiences participants would like to discuss that week.

- Review of the Seminar and Logistics (5 min)
  - TELL: Briefly review the basic logistics and process for the seminar.
    - Expectations for attendance and participation
    - Plans for where seminar will meet. Encourage meetings at different sites to visit participants' labs
    - How readings and assignments will be distributed and collected
    - Confidentiality is important to the seminar and everything discussed in seminar or on the course website will remain confidential. Be particularly mindful of creating a safe and confidential environment for junior faculty who are untenured.
    - How to document participation in the seminar for funding agencies and future grant applications
    - The seminar is designed for mentors actively working with a mentee. If that's not the case, participants can use their past experience in the discussions and adapt the assignments to plan for future mentoring relationships.

- Sharing mentor-mentee compacts in pairs and large group (10 min)
  - ACTIVITY (5 min): Have participants pair up and read one another's compacts (or verbally share the projects if they did not do the assignment).
    - TELL: Direct the pairs to discuss what the compacts tell the reader about what research is like in their disciplines. What is the mentoring philosophy implied by the compact?
  - DISCUSS (5 min): Have each pair share what they learned in their conversation with the larger group.

- *Expectations* Case Studies
  - ACTIVITY: Choose one of the *Expectations* case studies and distribute it. Let participants read the case individually.
  - DISCUSS: In the large group discuss reactions to the case study. Some possible guiding questions:
    - How do you establish and communicate your expectations to your mentee?
    - How do you find out what expectations your mentee has of you and of his or her graduate research experience?

- How do you establish goals and projects for a mentee?
- When choosing a project for your mentee, how do you weigh the mentee's interest with the immediate needs of the research PI or group?
- As an advisor or mentor, what should you do if a mentee does not like the project?
- How do you assess your mentee's skills so you can choose an appropriate project?
- How can you make sure your expectations take into account a mentee's individual learning style, background, and abilities?

❖ Awareness of communication and understanding (5 min)
- ➢ DISCUSS: Explore mentors' attention to and awareness of their communication with their mentees. Some possible questions to use:
  - How would you characterize the communication between you and your mentee regarding the research project?
  - What would your mentee's paragraph say if he or she wrote a description of the research project? Would it align with yours?
  - How would you discuss the differences in order to achieve better alignment?

❖ Assignment for next week (5 min)
- ➢ Write a description of your mentoring philosophy.

Reflection and Notes

Case Study (Expectations): Balancing Research and Teaching

Professor Xavier feels that his Ph.D. student Moira is too focused on teaching, and that this is interfering with her research progress. In particular, Xavier feels that Moira will better realize her potential and get a better job if she spends less time on her TA-ship. He is aware that women students and faculty are often expected, consciously or not, to put more effort into teaching and take on extra undergraduate responsibilities, but wants his student to avoid this trap. On the other hand, he believes that undergraduate teaching is in general undervalued, and feels bad about perpetuating the sense that it is a burden to be tolerated only because it "pays the bills for research." What, if anything, should Xavier say to Moira, and should he bring up gender or not?

Case Study (Expectations): High Maintenance Mentoring

At the beginning of his fourth year in graduate school, Joe took two qualifying exams, passing one and failing the other. Strictly by the rules, he should not be allowed to stay in the program. (In fact, he shouldn't have been allowed to stay so long with two exams remaining.) The graduate committee has put Joe's fate in the hands of John, his advisor, who feels Joe is weak and will struggle to complete a dissertation so it would be in everyone's best interest to make him leave. However, John is an assistant professor, and his senior colleague from the same field, Professor Zamboni, insists that he would be willing to oversee the thesis were he in the same position, while acknowledging that Joe will need extra mentoring. John calls a colleague at another institution for advice. "What should I do?" he asks.

Multidisciplinary Research Mentor Training Seminar
Session 3
Assessing Understanding and Fostering Independence

Core Themes and Objectives

Understanding

Determining if someone understands you is not easy, yet knowing if your mentee understands you is critical to a productive mentor-mentee relationship. Developing strategies to assess understanding is an important part of becoming an effective mentor.

Learning Objectives for Understanding

Mentors will have the knowledge and skill to:

- Assess their mentees' prior knowledge of the research field
- Assess/determine their mentees' understanding of core concepts and procedures in the research field
- Consider diverse strategies for enhancing mentee understanding
- Explain and/or model the practice of science and research in their discipline
- Assess their mentee's ability to develop and conduct a research project, analyze data and present results

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Independence

An important goal in any mentoring relationship is helping the mentee become independent; yet defining what an independent mentee knows and can do is not often articulated by either the mentor or the mentee. Defining what independence looks like and developing skills to foster independence are keys to becoming an effective mentor.

Learning Objectives for Independence

Mentors will have the knowledge and skill to:

- Consider the important roles they play in the academic, professional and personal development of their mentees
- Employ various strategies to build their mentees' confidence
- Implement varied approaches to foster their mentees' independence in scientific research
- Establish trust between themselves and their mentees
- Create an environment where mentees can achieve goals
- Stimulate creativity

SESSION OUTLINE

Activities

Debrief mentee interview and discussion of expectations assigned from last week

Discuss mentoring philosophies

Case Study: Understanding

Case Study: Independence

Participant Materials

Table tents and markers (or table tents from previous week)

Copies of *Understanding* case study: *It Seemed So Clear When You Explained It*

Copies of *Independence* case study: *Ready Mentee*

Assignments for Next Session

Bring in copies of your own case study to share with the class (or be prepared to present one verbally)

Reading "Mentoring Learned, Not Taught"

FACILITATOR NOTES

- Check-in: Any particular challenges or experiences participants would like to discuss that week.

- Discussion of Mentoring Philosophies (30 min)
  - ACTIVITY: Have participants exchange their written philosophy with someone else in the seminar. Have participants reflect and write for 3 minutes on what struck them about the mentoring philosophies they read.
  - DISCUSS: Participants discuss their reactions to the mentoring philosophies with the whole group. Some possible guiding questions:
    - What struck you about the mentoring philosophy you read?
    - Where (on the scale of visionary to detailed) should a philosophy be?
      - Where is yours?
    - How will you use your mentoring philosophy?
  - NOTE: As part of the discussion or to wrap it up, be sure to stress the following points:
    - A mentoring philosophy is a work in progress and they need to think about revising it as they go along
    - The mentoring philosophy could be included as part of a teaching philosophy
    - Explore how the mentoring philosophies are reflected in the research lab compacts.

- *Understanding* Case Study: *It Seemed So Clear When You Explained It* (10 min)
  - ACTIVITY (2-3 min): Distribute copies of the case study and let participants read it individually.
  - DISCUSS (7-8 min): Review reactions to the case study as a whole group. Some possible guiding questions:
    - How can you know if your mentee understands something?
    - What can you do in the future to make sure your mentee understands what you are saying?
    - How can you get mentees to assess their own understanding?
    - How can you effectively explain protocols to mentees without sounding condescending toward them?
    - How do you balance independence with understanding?
    - How can you identify the difference between a mentee who is "not getting" something vs. a mentee who is not trying?

- *Independence* Case Study: *Ready Mentee* (10 min)
  - ACTIVITY (2-3 min): Distribute copies of the case study and let participants read it individually.
  - DISCUSS (7-8 min): Discuss reactions to the case study as a whole group. Some possible guiding questions:
    - How do you foster independence?
    - How do you determine how much independence a mentee is ready for?
    - How do you convey to your mentee that it is it okay to make some mistakes?
      - How do you judge which and how many mistakes are acceptable?
      - How important is it for a mentee to make mistakes to become independent?
    - Can you give a mentee too much independence?
      - How would you know?
    - How do you determine the underlying reason for a mentee's need to ask for constant advice?
      - Consider personality, forgetfulness, fear of making mistakes, cultural differences, or lack of experience, which may lead to such behavior.
    - How can you determine if you are making assumptions about a mentee's ability to do research based on his or her background, ethnicity, gender, or some other factor?
    - What are possible consequences of talking negatively about a mentee to other researchers in the lab?

- REVIEW: Assignment for next session (5 min)
  - Bring in copies of your own case study to share with the class (or be prepared to present one verbally)
  - Reading "Mentoring Learned, Not Taught"

Reflections and Notes

Case Study (Understanding): It Seemed So Clear When You Explained It…

You have just explained a complicated technique to your mentee. As you were explaining the technique, she nodded the entire time as if she understood every word you were saying. When you were finished with your explanation, you asked her if she had any questions. She said no. Just to make sure, you asked her if everything was clear. She said yes. Three days later you asked the mentee how the experiment using this technique is going and she said she hadn't started because she did not understand the technique.

Case Study (Independence): Ready Mentee

An experienced graduate researcher was constantly seeking input from his mentor on minor details regarding his project. Though he had regular meetings scheduled with his mentor, he would bombard her with several e-mails daily or seek her out anytime she was around, even if it meant interrupting her work or a meeting that was in progress. It was often the case that he was revisiting topics that had already been discussed. This was becoming increasingly frustrating for the mentor, since she knew the student was capable of independent work (having demonstrated this during times she was less available). The mentor vented her frustration to at least one other lab member and wondered what to do.

Multidisciplinary Research Mentor Training Seminar
Session 4
Mentoring Challenges

Objectives

Mentors will:

- Explore the dynamics of their relationships with their mentees
- Understand more about their mentees' perspectives

Activities

Discuss mentoring challenges and strategies for addressing those challenges
Provide mid-point feedback on the seminar process
Discuss mentor-mentee communication issues (optional)

Participant Materials

Table tents
Process Check-in worksheet
Index cards (optional)
Communications Worksheet (optional)

Assignments for Next Session

Write a brief description of how you and your mentee(s) are different and how those differences might affect the research experience.
Read "Benefits and Challenges of Diversity" and "Mentoring Across Cultures"

FACILITATOR NOTES

- Check-in: Any particular challenges or experiences participants would like to discuss that week.

- Mentoring Challenges Discussion (25 min)
  - ACTIVITY: Have participants share copies of their biggest mentoring challenges from last week's assignment (if participants do not arrive in class with a written challenge, have them take 3-5 minutes to write their mentoring challenge down on an index card).
    - Write the challenges on the board.
    - Have the group to choose 1 or 2 of the challenges for discussion.
  - DISCUSS: Explore issues and dynamics that inform the challenges as a whole group. Have the group generate several approaches (at least 2-3) to address the selected mentoring challenge or challenges.

- How do you know if there is a problem with your mentee? (10 min)
  - ACTIVITY: Have participants brainstorm about how they will know if there is a problem with their mentee.
    - Write their ideas on a white board or flip chart for reference in the discussion that follows.
  - DISCUSS: Explore the fact that just because a mentee does not complain, it does not mean he or she is not struggling. Possible discussion questions:
    - How do you know if something is wrong?
    - How often should you check in on your mentoring relationship?
    - Can a mentee, over whom you have power, be truly honest with you about problems he or she is having in the mentoring relationship?

- Process Check (10 min)
  - ACTIVITY: Have participants fill in the mid-point process check-in and turn it in.
  - TELL: Share with participants that you will read these and reflect on them at the next meeting.

- Optional activity (10 min): If time allows, have participants complete 2 rows of the Communication Worksheet and then discuss it in pairs.

- Assignment for next session (5 min)
  - Write a brief description of how you and your mentee(s) are different. If you don't have a mentee, give a brief description of a past academic or work experience in which differences between individuals played a major role. Don't take the easy way out and talk about mere differences of opinion. Look deeper into relationships and backgrounds and how these differences might affect your mentoring relationship.
  - Read "Benefits and Challenges of Diversity" and "Mentoring Across Cultures"

Reflection and Notes

Seminar Process Check

1. What is going well in this seminar?

2. What is not going so well in this seminar?

3. How do you feel about the structure, activities, and format of the seminar?

4. How do you feel about the topics we've discussed? What topics have we not considered that you would like to explore?

5. Additional comments:

Communication Worksheet

In pairs, discuss the following questions as they relate to 2 of the statements below:

a. What was the likely intent of this statement or question?
b. How might the statement or question be heard?
c. How else could you say these questions or statements?

Statement or Questions	What was the intent?	How might it be heard?	How else could you say it?
"Be on time to our group meetings from now on"			
"How much longer do you think it will take you to finish that project?			
"You will never get anywhere in this field if you don't dig in and stick with problems until you solve them."			
"I am not sure the work you are doing in that area is really valuable."			
"Clean up your work area"			
"I haven't seen you around the building much. Are you taking time off?"			
"I am not sure you have your priorities in order."			
"What's it like to be a minority student in this program, anyway?"			
"It seems you might be better suited for an 'alternative' career"			

Multidisciplinary Research Mentor Training Seminar
Session 5
Addressing Diversity

Core Theme and Objectives

Diversity

Diversity along a range of dimensions offers both challenges and opportunities to any mentor-mentee relationship. Learning to identify, reflect upon, and engage with diversity is critical to forming and maintaining an effective mentoring relationship.

Learning Objectives for Diversity

Mentors will have the knowledge and skill to:

- Recognize some of the biases and prejudices they bring to the mentor-mentee relationship
- Implement concrete strategies for addressing issues of diversity
- Engage in conversations about diversity with their mentees
- Recognize how they can influence their mentees' decisions to commit to careers in science
- Improve their multicultural competency

Activities

Review and discuss the seminar process based on feedback from last week
Discuss reading on diversity
Case Studies: Diversity

Participant Materials

Table tents
Copies of compiled responses from Process Check-in
Copies of the *Diversity* case study: *Is it Okay to Ask?*
Copies of the *Diversity* case study: *Language Barriers* (optional)
Copies of the *Diversity* case study: *Declaration of Independence*

Assignments for Next Session

Write a possible solution to one of the mentoring challenges described during a previous session
Read "*Nature's* Guide for Mentors"

FACILITATOR NOTES

- Check-in: Any particular challenges or experiences participants would like to discuss that week.

- Discussion of Process Check-in (10 min)
  - DISCUSS: Review the feedback from the process check-in and how the seminar can be improved.

- Discussion of readings on diversity (15 min)
  - DISCUSS: Explore participants' reactions to the readings "Benefits and Challenges of Diversity" and "Mentoring Across Cultures," as well as the assignment on differences. Some possible guiding questions:
    - What was your initial reaction to the reading "Benefits and Challenges of Diversity?"
    - Are there aspects of the reading you agreed or disagreed with?
    - What did you learn from the reading that you did not already know?
    - List the aspects of diversity you wrote about for your assignment.
    - How does diversity enhance your mentoring relationship?
      - How does it challenge the relationship?

- *Diversity* Case Study: choose one of the three case studies (25 min)
  - ACTIVITY: Distribute the case study to participants and have them read it individually.
  - DISCUSS: Explore participants' reactions to the case study. Some possible guiding questions:
    - If you were the mentor in this case, would you feel comfortable exploring issues of cultural diversity with your mentee?
      - Specifically, how would you go about engaging someone in a discussion about their race, ethnicity, gender, disability, or other background characteristics?
    - What is your approach to addressing diversity with the people you work with?
    - What are some ways you can learn to better understand your mentee's attitudes and experiences?
    - Do you think someone's race, ethnicity, gender, disability or other background characteristics that may place them in a minority group affect their experiences as a mentee?
    - Do you think everyone should be treated the same?
      - Does treating everyone the same mean that everyone is being treated equally?
    - What is your approach to addressing diversity with your co-workers?
    - When you encounter a student or colleague who expresses a negative cultural bias what do you do?
    - How can you be inclusive to everyone and yet support individuality?

- What are some ways you can learn to better understand your mentee's attitudes and experiences?

❖ Assignment for next session (5 min)

➢ Ethics Assignments: Look-up a general ethics statement for your field published by the professional society most closely associated with your research. This may be the society associated with the premier journal in your discipline, or it could simply be an association that you belong to. The website for the society is probably online. Look over those ethics guidelines and think about how they apply to you and your work. Bring a copy of them to class. We will talk about how we teach (or fail to teach) ethics to our mentees. If you cannot find one, ask a senior colleague where it is, and if s/he doesn't know, ask why there isn't one. As a last resort, start drafting one yourself (and you might consider asking your societies why they don't have one).

➢ Reading: "*Nature's* Guide for Mentors"

Reflection and Notes

Case Study (Diversity): Is It Okay to Ask?

Last summer I worked with a fantastic undergraduate mentee. She was very intelligent and generated a fair amount of data directly relevant to a grant I am writing. I think that she had a positive summer research experience, but there are a few questions that still linger in my mind. This particular mentee was an African-American woman from a small town. I always wondered how she felt on a big urban campus. I also wondered how she felt about being the only African-American woman in our lab. In fact, she was the only African-American woman in our entire department that summer. I wanted to ask her how she felt, but I worried that it might be insensitive or politically incorrect to do so. I never asked. I still wonder how she felt and how those feelings may have affected her experience.

Case Study (Diversity): Language Barriers

I am a student in a very crowded lab. One summer, we hosted two students from Puerto Rico. The students were great—they worked hard, got interesting results, were fun to be around, and fit into the group really well. The problem was that they spoke Spanish to each other all day long. And I mean ALL DAY. For eight or nine hours every day, I listened to this loud, rapid talking that I couldn't understand. Finally, one day I blew. I said in a not very friendly tone of voice that I'd really appreciate it if they would stop talking because I couldn't get any work done. Afterwards, I felt really bad and apologized to them. I brought the issue to my mentoring class and was surprised by the length of the discussion that resulted. People were really torn about whether it is okay to require everyone to speak in English and whether asking people not to talk in the lab is a violation of their rights. Our class happened to be visited that day by a Norwegian professor and we asked her what her lab policy is. She said everyone in her lab is required to speak in Norwegian. That made us all quiet because we could imagine how hard it would be for us to speak Norwegian all day long.

Diversity: The Declaration of Independence

Mei-ling is a graduate student from China at a large R-1 institution. One summer, she is asked by her PI to mentor and undergraduate, Karen, who is on campus for an intensive, 8-week summer research experience. Karen is excited about being in this program and enthusiastic about doing research. She has no previous experience working in a lab. At the beginning of their work together, Mei-ling presented three experiments as options that Karen could do for her summer research project. Karen rejected all three and said she would like to come up with her own experiment for her 8-week project. After 3 days with no communication, Mei-ling selected one of the original three and suggested it would be best to just work on it in order to finish the project in time. Mei-ling trained Karen to use the techniques she needed for the project at which point Karen said she knew what she needed to do the work and would prefer to work on her own. Mei-ling checked in with Karen frequently to follow-up on how things were going and asked questions to see if Karen did understand the principles and processes of the study. Frequently, Karen's answers indicated a lack of understanding. Karen put in a lot of time at the lab, but did not want Mei-ling involved in her work. Mei-ling would schedule time to work on the project together to be sure that the process assigned for the project would work and could be completed within the 8-week period. Karen was frustrated and felt that the project would not be "hers" if Mei-ling worked on it too. Mei-ling asked Karen, "What are your expectations for me as a mentor?" Karen replied, "You're supposed to assist me. When *you* work on the project, you make *my* work a waste of time." Mei-ling was shocked and said, "You are being disrespectful."

Anne, the faculty PI for the lab, checked in with both Mei-ling and Karen a couple times over the 8-week mentoring experience. She knew about the conflict, and figured that as long as the project was completed things would be sorted out. At the end of the 8 weeks, Karen thanked Anne for the research opportunity and said she would be in touch to request letters of recommendation for graduate school. Mei-ling said she would never agree to mentor an undergraduate student for the summer research program again.

Multidisciplinary Research Mentor Training Seminar
Session 6
Ethics

Theme and Objectives

Ethics

Mentors play an important role in both teaching mentees about ethical behavior and modeling ethical behavior. Moreover, there are many ethical issues to consider when entering a relationship with a mentee based on the power dynamic that exists between mentors and mentees. Reflecting upon and discussing ethical behavior is an important part of becoming an effective mentor.

Learning Objectives for Ethics

Mentors will have the knowledge and skill to:

- Articulate the issues of ethics they need to discuss with their mentees
- Clarify the roles they play, both as teachers and role models, in educating mentees about ethics

Activities

Discuss ethics guidelines from professional societies
Case Studies: Research Ethics
Assignment: Summary paragraph of discussion about mentoring challenge with advisor or colleague

Participant Materials

Table tents
Copies of *Ethics* case study: *Tweaking the Data*
Copies of *Ethics* case study: *Intellectual Property*

Assignment for Next Session

Present a mentoring challenge to your own adviser/research mentor or another faculty member who you respect and discuss possible solutions. Write a summary of the discussion.

FACILITATOR NOTES

- Check-in: Any particular challenges or experiences participants would like to discuss that week.

- Discussion of professional societies' ethics guidelines (20 min)
  - ASK: Ask mentors to share the ethics statement for your field published by the professional society most closely associated with your research. Some possible guiding questions:
    - How do these guidelines apply to your work?
    - How do or can mentors teach these ethics to mentees?
    - What are good resources for teaching ethics?

- *Ethics* case studies: *Tweaking the Data*, and *Intellectual Property?* (25 min)
  - ACTIVITY (5 min): Distribute copies of case studies for participants to read and have them select which case to discuss first and second (and third, if time permits)
  - DISCUSS (20 min): Explore participants' reactions to the case study. Some possible guiding questions:
    - How can you teach a mentee good ethical behavior?
    - The entire scientific enterprise depends on trust (and the ability to repeat experiments) so what is the ethical responsibility of a mentee to keep a detailed notebook?
      - What is the responsibility of a mentor with respect to teaching a mentee how to keep a good lab notebook?
    - How do new researchers learn ethical practices in their discipline?
      - What is general and what is specific to the discipline?
    - Are there special issues for learning ethical practices in multidisciplinary research?
      - What are they?
    - What ethical issues can arise due to the power dynamic between a mentor and mentee?
    - How can a mentor's reaction to unexpected news motivate or influence a mentee to make good or bad ethical choices? What is the issue or point of conflict?

  - Some general questions for the ethics cases that may be useful:
    - Who are the stakeholders in this case (individuals, institutions, public)?
    - What are the facts? What assumptions are you making about the situation?
    - What are the consequences of the proposed course of action?
    - What other courses of action are possible? Which ones are preferable and why?
    - What, if anything, could have been done to prevent the situation?

- Assignment for next session (5 min)
  - Present a mentoring challenge to your own adviser/research mentor or another faculty member whom you respect and discuss possible solutions. Write a summary of the discussion.

Reflection and Notes

Case Study (Ethics): Tweaking the Data

John is mentoring an undergraduate in his lab, and has assigned her to collect data for one of the experiments in his dissertation. When the dataset is complete, he sits down to analyze it and finds his predictions completely disconfirmed. Dismayed, he calls her into his office and asks her to describe, in great detail, what she did when collecting the data. He wants to make sure that these anomalous results can't be more easily explained by mistakes in the lab. Their conversation lasts quite a while, but at the end he is still frustrated and puzzled by the data, and he sends her home so he can think about it some more.

Later, John is eating lunch in the cafeteria when he overhears his mentee talking to a friend of hers. "I think John is mad at me," she tells her friend, visibly upset, and describes their recent meeting. John is surprised to realize that his mentee took his questioning very personally. When John's mentee finishes venting, her friend replies, "If he's so mad, you probably did make a mistake somewhere. After all, he's the expert. Maybe you should tweak the data a little next time to keep him happy."

Case Study (Ethics): Intellectual Property?

It was summer, and Tim would finish his doctorate the following spring. He and his advisor, Professor Lovejoy, agreed that Tim had enough results for his thesis, so the coming school year would be devoted mostly to applying for jobs. However, Tim had another idea for a result he could possibly include in the thesis. He briefly described the new idea to Lovejoy, who decided it wouldn't be a major addition and wasn't all that interesting, so Tim should concentrate on writing up the existing results and applying for jobs. Tim took this advice to heart and did not resume working on the new idea, figuring he could save it for after graduation when the time was right.

Toward the end of the summer, Tim stopped by to see Lovejoy, who had a collaborator visiting, Professor Flanders. Tim asked about their project, heard a brief description, and returned home. Overnight Tim realized that the new idea he had mentioned to his advisor earlier in the summer could contribute to the project Lovejoy and Flanders were working on. The next day Tim told Lovejoy his thoughts. His advisor replied, more or less, “thanks but no thanks” saying different techniques had already been developed to obtain a slightly weaker result.

Tim graduated, moved on to a postdoc, and eventually read the published version of the work by Lovejoy and Flanders. To his shock, their paper developed the idea he had sketched to his advisor and included Tim’s stronger version of the result. There was no mention of Tim’s contribution, nor had Professor Flanders told him about the matter. Tim did not feel that he could confront his advisor because he still needed good letters of recommendation for future job applications. Was Tim wronged by Lovejoy, or was the shared idea “common property”?

Multidisciplinary Research Mentor Training Seminar
Session 7
Elements of Good Mentoring

Objectives

Mentors will:

- Explore and compare different approaches to mentoring
- Identify specific elements of their own approach to mentoring

Activities

Discussion of assignment
Creating a mentoring toolbox
Job scenario

Participant Materials

Table tents
Process Check-in worksheet

Assignment for Next Session

Bring 2 copies of the revised draft of your mentoring philosophy and/or your research mentoring compact to the next seminar session

FACILITATOR NOTES

- Check-in: Any particular challenges or experiences participants would like to discuss that week.

- Exploring approaches to mentoring (20 min)
  - ASK: Have each participant answer the following questions for the whole group:
    - What case did you present to your advisor/research mentor or other faculty member?
    - What did that person say?
  - DISCUSS: Explore more broadly what participants' answers show about the collective experience of mentoring. Some questions to guide your discussion:
    - What can we learn from other mentors?
    - Do you think other mentors are intentional about their approach to mentoring?
    - What effective mentoring practices have you observed from your own or other research mentors?
    - Are the general issues in research mentoring the same across disciplines or are there discipline-specific issues?

- Creating a mentor toolbox–applying what we have learned (15 min)
  - ACTIVITY: Have participants brainstorm answers to the following questions:
    - If you were giving advice to a new mentor on how to be effective, what would you tell that person?
    - If the new mentor asked how to do each thing listed, what would you say?

- Job scenario (15 min)
  - TELL: Provide the following scenario to participants:
    - You are applying for a position in your dream job.
    - You are told that mentoring students will be an important part of the job.
    - You are asked to describe your approach to mentoring and give a specific example of effective mentoring.
  - ACTIVITY: Have participants write down their thoughts about how they would answer and share their responses with the group.

- Assignment for next session (5 min)
  - Revised draft of your mentoring philosophy and/or "compact" you would distribute to your mentees working in your lab. Ask mentors to bring 2 copies to the next seminar session.

Reflection and Notes

Multidisciplinary Research Mentor Training Seminar
Session 8
Developing a Mentoring Philosophy

Objectives

Mentors will:

- Critically and constructively review their approaches to and experiences of mentoring relationships

Activities

Review mentoring philosophies and research mentoring compacts

Discuss opportunities to provide research mentor training to other researchers

Evaluate research mentor training seminar

Participant materials

Table tents

Copies of the "Reflecting on Mentoring" worksheet

FACILITATOR NOTES

- Check-in: Any particular challenges or experiences participants would like to discuss that week.

- Mentoring Philosophies (25 min)
  - ACTIVITY: Have participants swap mentoring philosophies and/or research mentoring compacts with each other and provide comments both in writing and verbally.
  - DISCUSS: Have participants share their feedback and reactions with the whole group.

- Reflecting on Mentoring Discussion (20 min)
  - ACTIVITY: Have participants answer the questions on the "Reflecting on Mentoring" worksheet.
  - DISCUSS: Explore participants' responses to the questions from the worksheet. The questions from the worksheet are:
    - Are there things that you learned in mentor training that did not make it into your philosophy?
      - What are they?
    - What are you going to use your mentoring philosophy for, if anything?
    - What will you do, specifically, the next time you mentor?
    - Reflect on your relationship with <u>your</u> mentor. How has this class affected your perception of that relationship?

- Application of the Research Mentor Training Seminar (10 min)
  - TELL: Be sure to share with participants that they are now qualified to provide research mentor training and can offer it at their future institutions if they so choose. They can obtain curriculum material at www.researchmentortraining.org
  - TELL: Encourage participants to use this training to their advantage in their professional careers. They should refer to this training, both their participation in it and their ability to teach it to others, in future job applications and grant proposals.

- Evaluation (5 min)
  - TELL: Let participants know they will be receiving a follow-up evaluation. A template evaluation instrument can be found in *Entering Mentoring: A Seminar to Train a New Generation of Scientists* available at *www.hhmi.org/grants/pdf/labmanagement/entering_mentoring.pdf*.

Reflection and Notes

Reflecting on Mentoring Worksheet

1) For your revised mentoring philosophy: Identify two or three things that you changed in your mentoring philosophy based on your experiences in this class.

2) Are there things that you learned in research mentor training that did not make it in to your philosophy? If so, what are they?

3) Specifically, how are you going to use your mentoring philosophy?

4) What will you do differently from now on when you mentor?

5) Reflect on your relationship with <u>your</u> mentor. How has this class affected your perception of that relationship?