Research Mentor Training: Building and Sustaining the Research Enterprise

Facilitating Entering Mentoring: Train-the-Trainers Workshop

Kelly Diggs-Andrews, Melissa McDaniels, Beronda Montgomery, Christine Pfund, and Christine Pribbenow

American Society for Microbiology, Michigan State University and University of Wisconsin-Madison

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The American Society for Microbiology
Research Mentor Training: Building and Sustaining the Research Enterprise

Workshop Leaders

**Kelly Diggs-Andrews**, PhD is a Mentoring Fellow with the American Society for Microbiology (ASM). Dr. Diggs-Andrews conducted diabetes and metabolism research during her doctoral training and completed a post-doctoral fellowship studying cognitive obstacles in a genetically predisposed tumor model both at Washington University in St. Louis. She received a Ruth L. Kirschstein National Research Service Award and Chancellor’s Diversity Graduate Fellowship to fund her dissertation research. She also contributed to numerous outreach and diversity initiatives at Washington University, including the formation of the Association of Black Biomedical Graduate Students (ABBGS), the Junior Scientist Institute (JSI), and the Young Scientists Program (YSP). Dr. Diggs-Andrews currently spearheads the National Science Foundation (NSF) co-sponsored ASM Leaders inspiring Networks and Knowledge (ASM-LiNK) initiative, a program to develop ASM’s mentoring capacity, to advance investigator-educator collaborations and interdisciplinary research, and to broaden participation of underrepresented individuals in science, technology, engineering, and math (STEM) fields.

**Melissa McDaniels**, PhD has been Assistant Dean of The Graduate School and Teaching Assistant Program Director at Michigan State University since January 2013. In 2012 and again in 2014, Dr. McDaniels co-taught (with Dr. Chris Pfund) the Research Mentor Training course through the CIRTL (Center for the Integration of Research, Teaching and Learning) Network. McDaniels has over 20 years of experience in graduate student and faculty development, undergraduate and graduate teaching and learning and organizational change. From 2008-2012, McDaniels served as Director of Michigan State University’s NSF ADVANCE Grant, where she spearheaded the institution’s efforts to diversify the faculty in STEM fields. Prior to 2008, she held full time positions at Northeastern University, Boston College, and National Geographic Society. She has also had the pleasure of consulting domestically and internationally, including Nelson Mandela Metropolitan University, Purdue University, MSU Center for the Scholarship of Teaching, and University of Wisconsin-Madison, on topics related to programmatic/learning assessment in higher education, graduate student research capacity development, and graduate student teaching development. The primary focus of McDaniels’ research is graduate student, postdoctoral and faculty professional development. She holds degrees from Michigan State University (Ph.D.), Boston College Graduate School of Education (M.A.), and University of Michigan (B.A.).

**Beronda Montgomery**, PhD completed doctoral studies at the University of California, Davis and was a National Science Foundation (NSF) funded postdoctoral fellow at Indiana University. She is an Associate Professor in the Department of Biochemistry and Molecular Biology at Michigan State University. Dr. Montgomery’s laboratory investigates the mechanisms by which organisms with limited mobility such as plants and cyanobacteria are able to monitor and adjust to fluctuations in their external environment. Dr. Montgomery’s scholarly efforts were recognized by her receipt of an NSF CAREER Award in 2007. In addition to her core research and teaching efforts, Dr. Montgomery is actively involved in efforts to promote the inclusion and success of individuals from groups underrepresented in the sciences. As a part of her efforts to promote research excellence and sustained mentoring of scientists, particularly those individuals from groups underrepresented in academe,
Dr. Montgomery is the steering committee chair of a new NSF-funded mentoring effort with the American Society of Microbiology (ASM). Her comprehensive efforts are to promote career competencies and increase diversity in both the natural sciences and in the professoriate in general.

Christine Pfund, PhD is a researcher with the Wisconsin Center for Education Research at the University of Wisconsin-Madison (UW). Dr. Pfund earned her PhD in Cellular and Molecular Biology, followed by post-doctoral research in Plant Pathology, both at University of Wisconsin-Madison. From 2003-2013, Chris served as the Associate Director of the Delta Program in Research, Teaching and Learning helping to train future faculty to become better more effective teachers. Chris is now conducting research with several programs across the UW campus including the Institute for Clinical and Translational Research (ICTR) and the Center for Women’s Health Research (CWHR). Her work focuses on developing, implementing, documenting, and studying a seminar to train research mentors across science, technology, engineering, mathematics and medicine (STEMM). She has co-authored a manual for facilitators of this seminar, Entering Mentoring, and co-authored several papers documenting the effectiveness of this approach. Currently, Chris is co-leading two studies focused on the impact of training on both mentors and mentees and understanding specific factors in mentoring relationships that account for positive student outcomes. Concurrently, Dr. Pfund is helping to lead a new study, Talking about Leaving Revisited which will investigate why rates of switching from STEM majors are largely unchanged despite efforts over the past 15 years to improve college science teaching.

Christine Maidl Pribbenow, PhD is an Associate Scientist at the Wisconsin Center for Education Research (WCER), University of Wisconsin-Madison. As a professional evaluator, she has worked on numerous programs to increase the representation of women and underrepresented minorities in STEM fields, and to improve the quality of teaching and learning in postsecondary institutions generally. Her research interests include the assessment of climate in departments and units in higher education institutions, work-life policies, the alignment of P-16 systems, and assessing teaching and learning at the undergraduate and graduate levels. She brings more than fifteen years of social science research experience to her work as a researcher and has authored or co-authored peer-reviewed papers, books and resource guides, technical reports, and survey instruments and rubrics. Dr. Pribbenow received her PhD from the Department of Educational Leadership and Policy Analysis at the University of Wisconsin–Madison in May 2000.

Building Capacity of Trained Facilitators and Reaching a Diverse Audience

Trained 120 facilitators via train-the-trainer workshops at national venues that focus on training of diverse scholars:

- UW Health Equity Leadership Institute
- Society for Advancement of Chicanos and Native Americans in Science (SACNAS)
- American Public Health Association
- Annual Biomedical Research Conference for Minority Students (ABRCMS)
- UW-Madison

Implementation of Facilitator Training to Disseminate Research Mentor Training for Diverse Scholars (R13GM106445, Co-PIs: Christine Pfund and Christine Sorkness)
The Roles of Research Mentors and Mentees

Principal Investigator (Faculty)

Post-doctoral researcher

Graduate Student

Undergraduate Researcher
<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
</table>
| 8:30 – 10:45 am | Introductions  
Mentor Training Workshop                                               |
| 10:45 – 11:45 am | Facilitator Training Workshop Overview  
Facilitation Basics  
Curriculum Overview                                                   |
| 11:45 – 12:45 pm | Individual Lunch and Break                                                |
| 12:45 – 2:00 pm  | Facilitation Practice                                                     |
| 2:00 – 2:15 pm   | Break                                                                    |
| 2:15 – 3:15 pm   | Facilitation Debrief  
Implementing the Curriculum                                               |
| 3:15 – 4:15 pm   | Draft a Mentor Recruitment and Implementation Plan  
Evaluation Measures of Research Mentor Training                          |
| 4:15 – 4:30 pm   | Workshop Evaluation                                                      |
Questions that will be addressed today:

- What is research mentor training?
- How do I facilitate research mentor training?
- How do I know if the training works?
- How can I make research mentor training happen on my campus?
Experiencing Research Mentor Training
The Roles of Research Mentors and Mentees

- Principal Investigator (Faculty)
- Post-doctoral researcher
- Graduate Student
- Undergraduate Researcher
Entering Mentoring 2\textsuperscript{nd} Edition

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<td>Articulating Your Mentoring Philosophy</td>
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Optimized for mentors across STEM engaged in mentoring undergraduate researchers, many of whom were graduate students and post-docs
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### Entering Mentoring 2nd Edition

#### Sessions

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Mentors will have the knowledge and skills to:

1. Learn about other mentors in the group and begin building a learning community
2. Reflect on group dynamics and ways to make the group functional
3. Establish ground rules for participation
4. Identify qualities of good research projects for their mentees
5. Prepare to establish effective research mentoring relationships with their mentees
Objective 1: Learn about other mentors in the group to begin building a learning community

Pair up and interview each other for 2 minutes each
• Write down facts about your partner’s work, research, and hobbies
• Answer these two training statements:
  1. I signed up for mentor training to ....
  2. The most important lesson I can learn is ...

Introduce your partner to the whole team (table)
Twist Playfully exaggerate 2 facts from your interview, except your partner’s name and training statements
Example: If your partner plays basketball, then say that (s)he taught Kobe Bryant and Michael Jordan how to dunk.
Objective 2: Reflect on group dynamics and ways to make the group functional

Constructive & Destructive Group Behaviors
(page 15)
Introduction and Learning Objectives (page 9)

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Optimized for mentors across STEM engaged in mentoring undergraduate researchers, many of whom were graduate students and post-docs.
Mentors will have the knowledge and skills to:

1. Provide constructive feedback
2. Use multiple strategies for improving communication (in person, at a distance, across multiple mentors, and within proper personal boundaries)
3. Engage in active listening
4. Communicate effectively across diverse dimensions including various backgrounds, disciplines, generations, ethnicities, positions of power, etc.
Participant Roles

“One”
“Two”
“Three”
Provide Constructive Feedback
Activity #1

Case Study: The Slob
(page 61)
A graduate student mentor was frustrated because her undergraduate student mentee was not running successful experiments. While the undergraduate student had great enthusiasm for the project, each experiment failed because of some sloppy error: forgetting to pH the gel buffer, forgetting to add a reagent to a reaction, or forgetting to turn down the voltage on a gel box. After a month of discussions, and careful attempts to teach the undergraduate student habits that would compensate for forgetfulness, the graduate student mentor was ready to give up. She spoke with her faculty adviser (the PI in the lab) and asked for advice, hoping that she could fix the problem.
The adviser offered to work with the undergraduate student mentee. When the undergraduate student walked into his office the next day, the faculty adviser said, “I hear you’re a slob in the lab. You gotta clean up your act if we’re going to get any data out of you.” Seeing the crushed and humiliated look on the student’s face, he quickly added, “I’m a slob too—that’s why I’m in here pushing papers around and not in the lab doing the hard stuff like you guys!”
Guiding Discussion Questions

• If you were the *mentee*, how would you feel?
• If you were the *mentor*, how would you feel?
• If you were the *faculty adviser*, how would you feel?
• If you were the adviser, how would you have handled this situation?
Strategies to Address Case Study: *The Slob*

- Mentors and PI need to work together
- Bring mentor and student together—mediate
- Address the problem sooner – should not have gone on very long
- Coach the graduate student to help them identify their role as a mentor
Objective 2

Communicate effectively across diverse dimensions
Activity #2

Brainstorming
Communication Strategies
### Activity #2

<table>
<thead>
<tr>
<th>Barrier to Effective Communication</th>
<th>Solutions to Overcome Barrier</th>
<th>Indications That Communication Has Improved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example: Lack of time to meet one-on-one</td>
<td>Frequent email, telecoms, or instant messaging chat time</td>
<td>Fewer misunderstandings and stalls in research progress</td>
</tr>
<tr>
<td>Power Differential</td>
<td>Social events, relaxed conversation, empathy, personal interactions</td>
<td>Mentee comes to the mentor with problems, talks with them</td>
</tr>
<tr>
<td>Different Cultures and Assumptions</td>
<td>Sharing meals, social events, read and educate ourselves, discuss science to open communication, use science as a common language, journal clubs and lab meetings</td>
<td></td>
</tr>
<tr>
<td>Lack of time</td>
<td>Routine, scheduled meetings with mentee and/or mentor, use electronic scheduling system to set up meetings, use a “check in”, shorter time meeting (15 minutes)</td>
<td></td>
</tr>
<tr>
<td>Lack of communication skills/understanding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitudes</td>
<td></td>
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</tr>
</tbody>
</table>
Objectives 3 & 4

Engage in active listening and use multiple strategies
What is Active Listening?

• Active listening is…
  – more than just paying attention
  – a communication skill that involves purposeful engagement with another attending to both verbal (what is said) and non-verbal (how it is said) content

• Active listening looks like…asking open ended questions, making summaries or paraphrases, and asking for clarification
Activity #3: Active Listening (Part 1)

- **5 minutes**
  - **Participant 1:** Share a current (previous) challenge (success) in his/her mentoring relationship(s).
  - **Participant 2:** Actively listen to Participant 1. Can ask questions where appropriate.
  - **Participant 3:** Observe Participants 1 and 2 and take note of body language and other verbal and non verbal behavior.
Activity #3: Active Listening (Part 2)

- 5 minutes
  - Participant 3: Provide feedback to both Participant 1 and Participant 2
Activity #3: Active Listening (Part 3)

• What did you learn from the exercise?

• What strategies did you come up with?
Learn about active listening:
- Pay close attention
- Can be active—taking notes, asking questions
- Difficult to stay focused on the other person— not about “me,” it’s about them
- Need to assess situation

Strategies:
- Taking notes
- Empathic responses, physical gestures
- Ask open-ended questions, probing
- Know what questions to ask, clarification questions
DEBRIEF AND BREAK
Learning to Facilitate Research Mentor Training
Who is here today participating in this Train-the-Trainers Workshop?
<table>
<thead>
<tr>
<th>Position</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Director/Supervisor</td>
<td>6</td>
</tr>
<tr>
<td>Professor</td>
<td>7</td>
</tr>
<tr>
<td>Associate Professor</td>
<td>5</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>6</td>
</tr>
<tr>
<td>Senior Lecturer</td>
<td>7</td>
</tr>
<tr>
<td>Researcher/Scientist</td>
<td>4</td>
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<tr>
<td>Post Doctoral Fellow</td>
<td>6</td>
</tr>
<tr>
<td>Graduate Student</td>
<td>11</td>
</tr>
<tr>
<td>USA</td>
<td>International</td>
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<td>------------------------------------------</td>
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</tr>
<tr>
<td>Alabama State University</td>
<td>Abia State University</td>
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<tr>
<td>Auburn University</td>
<td>Institute of Infectiology</td>
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<tr>
<td>Barry University</td>
<td>Fudan University</td>
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<tr>
<td>Forsyth Institute</td>
<td>Université de Montreal</td>
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<tr>
<td>Grady Memorial Hospital</td>
<td>Aveiro University</td>
</tr>
<tr>
<td>Harvard University</td>
<td>University of British Columbia</td>
</tr>
<tr>
<td>Michigan State University</td>
<td>Cairo University</td>
</tr>
<tr>
<td>Penn State University</td>
<td>University of Calabar</td>
</tr>
<tr>
<td>Sharp Grossmont Hospital</td>
<td>Coventry University</td>
</tr>
<tr>
<td>University of Michigan</td>
<td>University of Toronto</td>
</tr>
<tr>
<td>University of Massachusetts</td>
<td>Federal Ministry of Health</td>
</tr>
<tr>
<td>Novaritis Institute for Biomedical Research</td>
<td>Hawassa University</td>
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<tr>
<td>Novosibirsk TB Research Institute</td>
<td>Benson Idahosa University</td>
</tr>
<tr>
<td>Indiana State Department of Health</td>
<td>Anambra State University</td>
</tr>
<tr>
<td>Massachusetts Institute of Technology</td>
<td>Federal University of Technology</td>
</tr>
<tr>
<td>WA DOH Public Health Laboratories</td>
<td>Institute of Medical Microbiology</td>
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<td></td>
<td>Shanghai Jiao Tong University</td>
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<td></td>
<td>Fraunhofer Chile Research Foundation</td>
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<td></td>
<td>Institute of Tibetan Plateau Research</td>
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<tr>
<td></td>
<td>National Root Crops Research Institute</td>
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</tbody>
</table>
Who are you currently mentoring in a research context?

- Junior faculty: 7%
- Undergraduates: 31%
- Post-doctoral fellows: 28%
- Graduate students: 17%
- Medical students: 7%
- High school students: 7%
- Other: 7%
Small Group Facilitation Experience

- With Facilitator Training: 15%
- No Previous Training: 85%

Yes: 85%
No: 15%
Learning to Facilitate Research Mentor Training
What did you notice the workshop facilitators doing to help foster discussion this morning?

What other strategies could they have used?
Facilitation Challenges and Solutions

What can go wrong when facilitating a group?

- People disagreeing (conflict)
- Dominate
- No one talks
- Technology failures
- “Know It all” Person
- No focus

For facilitation basics, see pages 117-120.
Facilitation Challenges and Solutions

What are strategies for dealing with challenging group dynamics?

- **Conflict** = separate conflicting parties, work in different groups
- **Dominate** = engage other members of the group; give everyone a voice
- **No one talks** = use silence; call on people; recruit risk takers
- **No focus** = set a goal; ask if everyone knows what/why we are doing an activity; give explicit instructions

For facilitation basics, see pages 117-120.
Roles of a Facilitator

- Make it safe
- Keep it constructive and positive
- Give all participants a voice
- Make the discussion purposeful
- Be intentional and explicit
- Transition group smoothly from one activity to another
- Give group members functional roles and responsibilities

Most importantly, remember that your role in the seminar is *not* to teach others how to mentor, *but rather to guide them as they learn how to mentor better from one another.*
Roles of a Co-facilitator

- Support the lead facilitator in all the previous roles
- Note taker
- Time keeper
- Watch room to facilitate full participation
- Trade off role as lead facilitator
- Note resources when raised in discussion
- Facilitate small group conversations if the larger group is broken up into subgroups
Curriculum Overview:
Mentor Training Adaptation

**HHMI**
undergraduate

**NSF**
undergraduate

**NIH**
postdoc & jr faculty

**NIH**
graduate

**Entering Mentoring:**
(http://www.researchmentortraining.org/)

**Mentor Training for Clinical & Translational Researchers:**
(https://mentoringresources.ictr.wisc.edu/)
Entering Mentoring 2nd Edition

Optimized for mentors across STEM engaged in mentoring undergraduate researchers, many of whom were graduate students and post-docs

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</table>
Please purchase your own lunch and return to this room by 12:45pm
Practice Facilitation Activity

- Engage in small group activities from the curriculum with your practice facilitator (20 min)
- You will need your books to refer to the participant materials
- Provide constructive feedback to facilitator and discuss alternative facilitation approaches (10 min)
- Repeat with another activity and new facilitator
- One of the primary workshop facilitators will keep you on track and on time
<table>
<thead>
<tr>
<th>Curriculum</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
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</thead>
<tbody>
<tr>
<td><strong>Activity A</strong> (20 min)</td>
<td>Expectations Chapter 2 (pgs 32-40)</td>
<td>Independence Chapter 7 (pgs 94-95)</td>
<td>Ethical Behavior Chapter 8 (pgs 108-109)</td>
</tr>
<tr>
<td></td>
<td>Activity #2: Reviewing Compacts</td>
<td>Activity #1: Defining Independence</td>
<td>Activity #2: Case Studies</td>
</tr>
<tr>
<td>Facilitator</td>
<td>Izard, Jacques</td>
<td>Callaghan, Amy</td>
<td>Glover, William</td>
</tr>
<tr>
<td><strong>Activity B</strong> (20 min)</td>
<td>Equity &amp; Inclusion Chapter 5 (pgs 68-69)</td>
<td>Equity &amp; Inclusion Chapter 5 (pg 70)</td>
<td>Expectations Chapter 2 (pgs 32-40)</td>
</tr>
<tr>
<td></td>
<td>Activity #3: Implications of Diversity Research</td>
<td>Activity #4 Case Study: Is It Okay To Ask?</td>
<td>Activity #2: Reviewing Compacts</td>
</tr>
<tr>
<td>Facilitator</td>
<td>Pond, Leslie</td>
<td>Jha, Prabhat</td>
<td>Lazazzera, Beth</td>
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The ability to take an answer – take a key word – and relate ideas together – synthesize – important skill but takes practice!

Having it laid out helps – open-ended questions are helpful

If the questions are there don’t fit the institution, you can change it! Make the training yours!

How idealized is this situation? How does it work real-time?

Getting practice – sometimes you get an answer that isn’t the question you ask – what do you do then?!?!
Does Research Mentor Training Work?
Curriculum Adaptation: Entering Mentoring Curriculum


Mentor Training for Clinical & Translational Researchers: [https://mentoringresources.ictr.wisc.edu/](https://mentoringresources.ictr.wisc.edu/)
Overview of Randomized Trial to Test Effectiveness of Mentor Training Curriculum

**Entering Mentoring**
- Curriculum adapted for clinical and translational researchers

**Training Implementation**
- Trained facilitators administered curriculum to 16 sites across the country and in Puerto Rico

**Evaluation**
- Tested the effectiveness of the curriculum via a randomized controlled trial

Jan 2010 - Aug 2011
## Curriculum Adaptation: Final Published Version

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<td>Maintaining Effective Communication (90 min)</td>
</tr>
<tr>
<td><strong>Session 2</strong></td>
<td>Aligning Expectations (75 min)</td>
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<td></td>
<td>Assessing Understanding (45 min)</td>
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<tr>
<td><strong>Session 3</strong></td>
<td>Addressing Equity and Inclusion (60 min)</td>
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<td></td>
<td>Fostering Independence (60 min)</td>
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<tr>
<td><strong>Session 4</strong></td>
<td>Promoting Professional Development (90 min)</td>
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<td></td>
<td>Articulating a Mentoring Philosophy and Plan (30 min)</td>
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</table>
Training Implementation: Mentoring Trial Sites (n=16)
Training Implementation: Participant Recruitment

Inclusion criteria for Mentors:
- Current research mentor of qualifying mentee

Inclusion criteria for Mentees:
- Conducting clinical and translational research ≥ 50%
- Target groups:
  1. NIH Mentored Career Development Awardees (e.g., KL2/K12, K08, K23)
  1. Post doctoral fellows
  2. Clinicians and clinical fellows
  3. PhD students
Recruited 283 mentor/mentee pairs across 16 sites

Mentor and Mentee Baseline Interviews (MCA) N=566

Mentors Randomized

Mentors Allocated to Control Group N=139

Mentors Allocated to Training Group N=144

Training Implemented (6-14/site)

Mentor and Mentee Follow-Up Interviews (MCA) N=552; 98%

Mentor Post-Training Surveys

Jan 2010

July- Oct

Sept 2010 – Feb 2011

Aug 2011

= Implementation

= Assessment
Study Population
N=283 Mentors

Career Stage
- Professor: 30% in Control, 32% in Intervention
- Associate Professor: 12% in Control, 12% in Intervention
- Assistant Professor: 58% in Control, 56% in Intervention

Gender
- Male: 45% in Control, 35% in Intervention
- Female: 55% in Control, 65% in Intervention
Study Population
N=283* Mentors

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>N</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>257</td>
<td>(90.8)</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>20</td>
<td>(7.1)</td>
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<tr>
<td>Black/African American</td>
<td>6</td>
<td>(2.1)</td>
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<tr>
<td>Chinese</td>
<td>9</td>
<td>(3.2)</td>
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<tr>
<td>Asian Indian</td>
<td>7</td>
<td>(2.5)</td>
</tr>
<tr>
<td>Other Asian</td>
<td>5</td>
<td>(1.8)</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
<td>(2.1)</td>
</tr>
</tbody>
</table>

*Respondents could choose more than one category
The most common profile for a mentor is a 50 year old white male professor with 15 years of mentoring experience.
Study Population
N=283 Mentees

Control N=139

Intervention N=144

Career Stage
- Assistant Professor: 24%
- Associate Professor: 4%
- Postdocs/Fellows: 21%
- Scientist: 4%
- Other Trainee: 6%

- Assistant Professor: 47%
- Associate Professor: 36%
- Postdocs/Fellows: 34%
- Scientist: 4%
- Other Trainee: 6%
Study Population
N=283 Mentees

Control N=139
- Male: 59%
- Female: 41%

Intervention N=144
- Male: 58%
- Female: 42%
Study Population
N=283* Mentees

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>N</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>208</td>
<td>(74.0)</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>32</td>
<td>(11.4)</td>
</tr>
<tr>
<td>Black/African American</td>
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<td>(6.8)</td>
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<tr>
<td>Chinese</td>
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<td>(5.0)</td>
</tr>
<tr>
<td>Asian Indian</td>
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<td>(7.1)</td>
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<tr>
<td>Other Asian</td>
<td>16</td>
<td>(5.7)</td>
</tr>
<tr>
<td>Other</td>
<td>21</td>
<td>(7.5)</td>
</tr>
</tbody>
</table>

*Respondents could choose more than one category

The most common profile for a mentee is a 36 year old white female who is an assistant professor.
Recruited 283 mentor/mentee pairs across 16 sites

Mentor and Mentee Baseline Interviews (MCA) N=566

Mentors Randomized

Mentors Allocated to Training Group N=144

Training Implemented (6-14/site)

Mentor and Mentee Follow-Up Interviews (MCA) N=552; 98%

Mentor Post-Training Surveys

Mentor Post Training Survey
N=128

1. Effectiveness of the training sessions
2. Self-reported skills gains
Mentor Satisfaction with Training
N=128

Was the 8-hour training a valuable use of your time?
- Yes: 88%
- No: 12%

Would you recommend the sessions to a colleague?
- Very Likely: 45%
- Likely: 45%
- Unlikely: 6%
- Very Unlikely: 4%

Mentor Skills Gains (n=124)

Before After

- Communicating Effectively
- Establishing Expectations
- Assessing Understanding
- Addressing Diversity
- Fostering Independence
- Professional Development

Recruited 283 mentor/mentee pairs across 16 sites

Mentor and Mentee Baseline Interviews (MCA) N=566

Mentors Randomized

Mentors Allocated to Control Group N=139

Mentor and Mentee Follow-Up Interviews (MCA) N=552; 98%

Training Implemented (6-14/site)

Mentor Post-Training Surveys

= Implementation

= Assessment

Training Evaluation: Baseline Interview Schedule

- Conducted with mentors and mentees (n=566, 283 pairs) in person by trained research assistants at each site
  - Close-ended survey
  - MCA (Mentoring Competency Assessment)
**Mentoring Competency Assessment (MCA) 26 items**

<table>
<thead>
<tr>
<th></th>
<th>1 Not at all Skilled</th>
<th>2</th>
<th>3</th>
<th>4 Moderately Skilled</th>
<th>5</th>
<th>6</th>
<th>7 Extremely Skilled</th>
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</thead>
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<tr>
<td>Effective Communication</td>
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<td>Aligning Expectations</td>
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</tr>
<tr>
<td>Assessing Understanding</td>
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<tr>
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<td>Addressing Equity &amp; Inclusion</td>
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<td></td>
</tr>
<tr>
<td>(2 items)</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fostering Independence</td>
<td></td>
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<td></td>
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<tr>
<td>(5 items)</td>
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<tr>
<td>Promoting Professional Development</td>
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<td></td>
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</tr>
<tr>
<td>(5 items)</td>
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</tbody>
</table>

Training Evaluation: Post Interview Schedule

- Conducted with mentors and mentees (n=552, 98% retention rate) via phone by staff at UW Madison
  - Mirrors baseline but also includes:
    - Retrospective assessment of skills
    - Qualitative section
      - Mentors asked if they changed their behavior in each of the six competencies since baseline
      - Mentees asked if noted changes in their mentors’ behavior in each competency since baseline
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working with mentees to set clear expectations of the mentoring relationship—BEFORE</td>
<td>Not at all Skilled</td>
<td>Moderately Skilled</td>
<td>Extremely Skilled</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Working with mentees to set clear expectations of the mentoring relationship—NOW</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accurately estimating your mentees’ level of scientific knowledge—BEFORE</td>
<td>Not at all Skilled</td>
<td>Moderately Skilled</td>
<td>Extremely Skilled</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accurately estimating your mentees’ level of scientific knowledge—NOW</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td></td>
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</tr>
</tbody>
</table>

Mentor Behavioral Change

• Content analysis used to code qualitative ‘stages of change’ with inter-rater reliability of 98.7%

• Coded across 4 stages of change
  – No change
  – Awareness
  – Intent to Change
  – Implemented Change

• Each mentor assigned to the highest stage of change noted in responses

Mentor Behavioral Change
N=141; 3 months post training

**Intervention**
- No change: 87%
- Awareness: 8%
- Intent: 3%
- Implemented: 2%

**Control**
- No change: 47%
- Awareness: 10%
- Intent: 1%
- Implemented: 1%

The pie charts above illustrate the distribution of behavioral change among participants in the intervention and control groups, with the intervention group showing a higher percentage of no change compared to the control group.
IMPLEMENTING THE CURRICULUM:
GETTING STARTED AT YOUR INSTITUTION
Getting Started at Your Institution:
Mentor Training Implementation Plan

1. Who will be your target mentors for training?

2. What are the career stages of the mentee with whom these mentors work?

3. What format will your training take (8 one-hour sessions, 4 two-hour sessions, all day workshop, shorter workshop on certain topics)?

4. When would you implement the training?

5. How many mentors would you hope to train in your first round of implementation?

For additional support, go to
www.researchmentortraining.org
mentoringresources.ictr.wisc.edu
6. What recruitment strategies will you use?

7. Who would facilitate/co-facilitate the training?

8. What resources could you leverage to support implementation ($$, admin help, etc.)?

9. How will you know if your training has been effective?

10. Are there barriers or challenges to overcome to implement training at your institution?

11. What else do you need to get started?

For additional support, go to
www.researchmentortraining.org
mentoringresources.ictr.wisc.edu
Learning Goals for Undergraduates

Part 1: Students will find a research mentor, write a research project proposal, and begin research.

Part 2: Students will make significant progress on their research project, present their findings in a public venue, and write a mini-grant proposing the next phase of their research.
Resources to Support Implementation

Available Curricula
Build Your Own Curricula
Implementation and Recruitment Guides
Resources by Stage of Relationship
Evaluation Instruments and Links

www.researchmentortraining.org
https://mentoringresources.ictr.wisc.edu/
Improving Research Mentoring Relationships: Two Websites for Resources and Training Curricula

Two web-based resources for mentorship development have been created at UW Madison to disseminate resources for mentors and mentees, including research mentor training curricula.

http://researchmentortraining.org/

This website provides:

- Training curricula for the mentors of undergraduates across STEM, including:
  - Astrophysics
  - Biology
  - Chemistry
  - Engineering
  - Field Biology
  - Math
  - Multidisciplinary
  - Physics
  - Psychology
- Option to preview and choose materials to ‘build your own’ curriculum

Contact the Delta Program, info@delta.wisc.edu for information on local trainings

http://mentoringresources.ictr.wisc.edu

This website provides:

- Training curricula for junior faculty, post docs, and graduate students in the health sciences, including ability to ‘build your own’
- Information on best mentoring practices across the four major stages of mentoring relationships
- Instruments & centralized data collection for the evaluation of mentoring relationships and mentor training efforts

Contact Stephanie House, house2@wisc.edu for more information
Possible Formats

• Think about:
  – Length of program, on-line/in-person, stand-alone or integrated (e.g. summer research program), credit-bearing/non-credit, required/not-required, partners (BE CREATIVE!)

• Examples:
  – Full-day workshop, workshop series, brown-bag lunch session, course/seminar, part of broader professional development program.
Ask yourself:

Who will you train (which mentors)?

What will motivate mentors to participate?
Recruitment Strategies

• Effective mentoring saves time and is more rewarding
• Evidence indicates research mentor training is effective
• Even experienced mentors learn strategies for more effective mentoring from the training
• Federal funding agencies are calling for evidence-based mentor training and the use of Individual Development Plans (IDPs)
Draft an Implementation Plan

- What recruitment strategies will you use?
- How many mentors would you hope to train in your first round of implementation?
- When would you implement?
- Who would facilitate/co-facilitate the training?
- What resources could you leverage to support implementation ($$, admin help, etc.)?
- Will you offer open-enrollment training and/or training that is linked to specific program(s)?
- How will you know if your training has been effective?
- What else do you need to get started?
Evaluation of Implementation and Mentor Training

When you implement mentor training at your institution, who will be affected?

What will you want to know about the effects of training on each of these groups?
Evaluating the implementation of research mentor training at your institution

Facilitator Survey:
- Training implementation
- Effectiveness of the training
- Perspective about being a facilitator of the training
- Demographic information
Evaluating the implementation of research mentor training at your institution

Mentor Surveys:
Original *Entering Mentoring* survey: mentor effectiveness scale

*Mentoring Competency Assessment* (MCA): self-reported gains in 6 mentoring competencies
Evaluating the implementation of research mentor training at your institution

Mentee Surveys:
Undergraduate Research Student Self Assessment (URSSA): self-reported learning gains, science identity, motivation, career plans

Classroom/Summer Undergraduate Research Experiences (CURE/SURE): self-reported learning gains, science identity, career plans

Original Entering Mentoring survey: mentor effectiveness scale

Mentoring Competency Assessment (MCA): assessment of mentor competencies in 6 areas
Evaluating the implementation of research mentor training at your institution

How will your institution, department and program be changed due to the training?

How will you know? What will you measure?

What is already in place that you could use to assess change?
Evaluation Resources

Mentor Training Instruments and Links for MCA:
https://mentoringresources.ictr.wisc.edu

Entering Mentoring:
https://researchmentortraining.org

Undergraduate Research Student Self-Assessment (URSSA):
https://www.colorado.edu/eer/research/undergradtools.html

Classroom/Summer Undergraduate Research Experience (SURE/CURE):
http://www.grinnell.edu/academics/areas/psychology/assessments
Question and Answer
Acknowledgements

**UW-Madison (past and present)**

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- Implementation of Facilitator Training to Disseminate Research Mentor Training for Diverse Scholars (R13GM106445, Co-PIs: Christine Pfund and Christine Sorkness)
Workshop Evaluation

Please complete the workshop evaluation and leave on the table before you leave.

Thank you!
Pick Up Your Certificate of Completion

Certificate of Completion

presented to

Workshop Participant

for attending

Research Mentor Training: Building and Sustaining the Research Enterprise

May 17, 2014

Christine Pfund, PhD
Co-Editor, Entering Mentoring Series
Researcher, University of Wisconsin-Madison

Beronda Montgomery, PhD
Chair, NSF/ASM-LINK Steering Committee
Associate Professor, Michigan State University