Mentoring Graduate Students
A Seminar for the MSU Division of Engineering Research
Dr. Katy Luchini Colbry
October 1, 2019
Welcome

Dr. Katy Luchini Colbry
email: colbryka@msu.edu

Assistant Dean, Graduate Student Services
College of Engineering, Michigan State University

Master Facilitator
NRMN / CIMER

Director of Engineering Futures
Tau Beta Pi Association

Chairperson, Graduate Studies Division
American Society for Engineering Education
Seminar Goals

Increase Awareness of Mentoring Research and Resources

- What is Mentoring?
- Why is it Valuable?
- National Research Mentoring Network (NRMN)
- Center for the Improvement of Mentored Experiences in Research (CIMER)

Explore Practical Strategies to Improve Mentoring

- Discuss different factors that impact mentoring relationships
- Explore techniques for aligning expectations and building trust in mentoring relationships
- Describe ways to communicate effectively in mentoring relationships
What is Mentoring?

A collaborative learning relationship that proceeds through purposeful stages over time and has the primary goal of helping mentees acquire the essential competencies needed for success in their chosen career.

It includes using one’s own experience to guide another through an experience that requires BOTH personal and intellectual growth and development.

Pfund et al, AIDS and Behavior, 2016; McGee, AIDS and Behavior, 2016
Which is “Mentoring”? 

1. I think it's a good idea for you and Dr. Carpenter to both go to the APS conference this year.

2. I need you to go to the APS conference to represent our research group.

3. Given your latest thoughts about what you want to do next year, what do you think are the benefits and drawbacks of going to the APS conference this year? What do you think is best for you?

4. If you go to the APS conference, I can arrange for you to meet a friend of mine, who has been looking for someone with your skills for a collaboration.
Which is “Mentoring”?

1. **ADVISING:** I think it's a good idea for you and Dr. Carpenter to both go to the APS conference this year.

2. **SUPERVISING:** I need you to go to the APS conference to represent our research group.

3. **MENTORING:** Given your latest thoughts about what you want to do next year, what do you think are the benefits and drawbacks of going to the APS conference this year? What do you think is best for you?

4. **SPONSORING:** If you go to the APS conference, I can arrange for you to meet a friend of mine, who has been looking for someone with your skills for a collaboration.
Research Shows Many Benefits of Strong Mentoring

- **Enhanced self-efficacy**

- **Desire to pursue a Ph.D or M.D/Ph.D.**
  (McGee and Keller, 2007)

- **Persistence**
  (Sambunjak et al, 2010; Alberta et al, 2001; Solorzano 1993)

- **Research productivity**
  (Steiner et al, 2002; Wingard et al, 2004)

- **Higher career satisfaction**
  (Schapira et al, 1992; Beech et al, 2013)

- **Enhance recruitment of underrepresented students into research-related career pathways**
  (Hathaway et al, 2002; Nagda et al, 1998)
Can Strong Mentoring Skills be Taught?
**Significance:** The first RCT to assess the effectiveness of a formal mentor training program implemented and tested at 16 Academic Health Centers in the U.S.

*Academic Medicine* 2014;89(5):774-782

**Training Mentors of Clinical and Translational Research Scholars: A Randomized Controlled Trial.**


**PURPOSE:** To determine whether a structured mentoring curriculum improves research mentoring skills.

**CONCLUSIONS:** This RCT demonstrates that a competency-based research mentor training program can improve mentors' skills.
NRMN is a nationwide consortium of biomedical professionals and institutions collaborating to provide all trainees across the biomedical, behavioral, clinical and social sciences with evidence-based mentorship and professional development programming that emphasizes the benefits and challenges of diversity, inclusivity and culture within mentoring relationships, and more broadly the biomedical research workforce.

Supported by the NIH U54 GM119023
Center for the Improvement of Mentored Experiences in Research (CIMER)

CIMER: Providing resources for organizations and institutions to improve research mentoring relationships

Effective research mentoring relationships are critical to developing the next generation of researchers. Learn how to improve these relationships at all career stages and promote cultural change that values excellence in research mentoring as a critical aspect of diversifying the research workforce.

Who are we?
Researchers and practitioners dedicated to improving research mentoring relationships among all career stages of post-secondary researchers.

What do we do?
CIMER faculty and staff investigate approaches for improving research mentoring relationships for organizations and institutions. We develop, implement and evaluate mentor and mentee training and materials.

News

UW–Madison Researchers Contribute to NAS Report on Undergraduate Research Experiences

A National Academies of Sciences committee whose members include CIMER's Janet Branchaw
Seminar Goals

Increase Awareness of Mentoring Research and Resources
- What is Mentoring?
- Why is it Valuable?
- National Research Mentoring Network (NRMN)
- Center for the Improvement of Mentored Experiences in Research (CIMER)

Explore Practical Strategies to Improve Mentoring
- Discuss different factors that impact mentoring relationships
- Explore techniques for aligning expectations and building trust in mentoring relationships
- Describe ways to communicate effectively in mentoring relationships
Case Study: Seeing the Forest Through the Trees

One of my graduate students just can’t see the forest for the trees. In my lab we deal with large and complex datasets. When he generates such a dataset, he will analyze it with every statistical tool he can find. It’s like he sends his data through a meat grinder! Then, when he writes a paper draft or presents his work in lab meetings or at a conference, he spends far too much time talking about the statistics and not enough time talking about what the results mean. I’m just really struggling with how to make him understand that there is more to science and engineering than statistics!
Let’s Reframe the Mentoring Relationship

It is critical to keep in mind that effective mentoring is less about what a mentor or mentee “gives” to you and more about how the two of you can collaborate to meet each other’s needs, deliver products to sponsors, and grow the intellectual enterprise of your research group.
## Elements for Effective Research Mentoring Relationships

<table>
<thead>
<tr>
<th>Skills</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disciplinary Research Skills</td>
<td>Knowledge, Techniques, Responsible conduct of research</td>
</tr>
<tr>
<td>Interpersonal Skills</td>
<td>Listening actively, Aligning expectations, Building trust</td>
</tr>
<tr>
<td>Culturally-Focused Skills</td>
<td>Promoting inclusion, Reducing bias and stereotype threat</td>
</tr>
<tr>
<td>Psychosocial Skills</td>
<td>Providing motivation, Developing a sense of belonging</td>
</tr>
<tr>
<td>Sponsorship Skills</td>
<td>Fostering independence, Promoting professional development</td>
</tr>
</tbody>
</table>
Research Mentoring Relationships

MENTOR

MENTOR/MENTEE

MENTEE

Principal Investigators (Faculty)

Junior Faculty/Post-doctoral researchers

Graduate/Medical Students

Undergraduate Researchers
Building Trust: Establish Ground Rules

Make implicit expectations visible to everyone
  • What are our expectations for ourselves? For others?

Address concrete concerns
  • When do meetings start? What happens if you’re late?
  • What is your preferred communication method?

Consider broader issues
  • What behaviors enhance mentoring relationships?
  • What behaviors detract from mentoring relationships?
Building Trust: Aligning Expectations

Effective mentor-mentee relationships require a **shared understanding** of what each person expects from the relationship.

Problems between mentors and mentee often arise from misunderstandings about expectations.

**Expectations change over time** so it is critical to regularly reflect on and communicate about expectations.
Effective Communication...

...occurs when information is both shared and understood
...builds trust and fosters relationships
...helps the speaker communicate needs and goals
...helps the listener understand and participate in solutions
Effective Communication: Mentoring Compacts

• What are Mentoring Compacts?
  • A written document used to articulate expectations between mentors and mentees
  • Differs from an Individual development Plan (IDP) which focused on short and long-term career plans;
  • Focused on expectations for the working relationship on a daily or weekly basis
  • Compacts vary in their format and level of detail

• Why are Mentoring Compacts Valuable?
  • Provides written documentation of expectations which can be revisited and revised over time
  • Serves as a shared reference point for regular progress reviews
  • Makes invisible expectations, visible
  • Levels the playing field among mentees
Effective Communication: 3x3 Updates

Email your mentor each week with a BRIEF update

- What did you accomplish?
- What questions or challenges arose?
- What are your plans for next week?

Use bullet points and brief, but complete, phrases

Limit each section to not more than three items

- If needed, you can provide more detail afterwards

Send the emails every week, even if you get no response!
Example: 3x3 Update

Hi, Dr. Colbry –

Here’s a quick summary of what I did the week of January 14. Please let me know if you have any questions.

   – Sarah

Accomplishments

- Completed experiments 1 and 2
- Ordered replacement parts for the experimental rig
- Drafted poster abstract for APS student poster competition

Questions/Challenges

- The rig broke after experiment 2, so I had to push the plans for experiment 3

Plans for Next Week

- Draft extended abstract for APS conference, focusing on last semester’s results
Seminar Goals

Increase Awareness of Mentoring Research and Resources
- What is Mentoring?
- Why is it Valuable?
- National Research Mentoring Network (NRMN)
- Center for the Improvement of Mentored Experiences in Research (CIMER)

Explore Practical Strategies to Improve Mentoring
- Discuss different factors that impact mentoring relationships
- Explore techniques for aligning expectations and building trust in mentoring relationships
- Describe ways to communicate effectively in mentoring relationships
Questions? Resources? Training?

colbryka@msu.edu
https://nrmnet.org
https://cimerproject.org
https://www.egr.msu.edu/graduate/mentoring