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Collaboration Through a Pandemic: A Virtual Inter-Institutional Collaborative Faculty Mentoring Training Workshop Model

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Mentoring of graduate students and postdoctoral scholars is an integral part of training at research institutions. Mentoring scholarship has rapidly evolved over the last two decades, elucidating the need for shifts in mentor/mentee relationships, including the need for mentor training. The University of Maryland, Baltimore and the University of Maryland College Park combined mentoring workshops based on an established curriculum. Workshops were offered to faculty at different institutions in the Maryland system growing out of a need from the National Science Foundation Alliances for Graduate Education and the Professoriate (NSF AGEP) Promise Academy Alliance. The authors share the model they developed as well as the benefits and challenges of the inter-institutional approach.

Introduction/Background

Research institutions strive to produce new knowledge by investigating phenomena, experimentation, and analysis. What is key to the continuation of this production of knowledge is training the next generation of investigators, namely, doctoral students and postdoctoral

scholars (trainees), as part of the academic life cycle. The traditional approach to mentorship training is the apprenticeship model, where the faculty primary investigator (P.I.) serves as the singular advisor and/or mentor to the trainee, providing academic, professional, and career development instruction or advice. In this form of training, the trainee relies heavily on the P.I. as a role model, often learning how to mentor implicitly rather than explicitly and being the receiver of information rather than being in a dynamic mentor-mentee relationship. This dyadic interaction in a mentoring relationship means the mentor is expected to provide all the support functions of mentorship, including psychosocial support, career support, career guidance, skill development, and sponsorship (National Academies of Sciences, Engineering, and Medicine [NASEM], 2019). Given the responsibilities most mentors face, including research, teaching, and various forms of service, having the bandwidth to meet these varying needs, often with multiple mentees, is largely unrealistic.

In more recent years, academic mentoring has been influenced by professional associations such as the Association of American Medical Colleges (AAMC), National Postdoctoral Association, and the National Academies. In 2008, the AAMC Group on Graduate Research, Education, and Training (GREAT) and the AAMC Council of Faculty and Academic Societies (CFAS) created the "Compact Between Biomedical Graduate Students and Their Research Advisors" as a means to increase transparency and clarify expectations for trainees and research advisors. In addition, the GREAT group published *The Appropriate Treatment of Research Trainees* (AToRT) document in 2021, which provides guidance on best practices in training graduate students and postdoctoral scholars and ways to address inappropriate treatment. The intent for these guiding documents is to enhance the effectiveness of mentoring for students and postdocs, particularly to increase the retention of underrepresented populations in the academy (NASEM, 2019; Pitt et al., 2022).

The National Postdoctoral Association (NPA) beginning in 2009 has published several documents relating to postdoctoral scholars' role in the academy and how they can be appropriately supported throughout their career through involvement with the ADVANCE-PAID grants from the National Science Foundation (NSF). In 2013, the NPA received funding through the Elsevier Foundation and published the resource book *From Ph.D. to Professoriate: The Role of the Institution in Fostering the Advancement of Postdoc Women* (Ehm & Phillips, 2013). This effort was followed up in 2015 with the "Advancing Postdoc Women Guide-

book" (Huang, 2015), funded by the NSF. Both publications point to the essential nature of effective mentorship in retention and career advancement of postdocs. The most recent publication, in 2017, *Parents in the Pipeline: Retaining Postdoctoral Researchers With Families* (Lee et al., 2017), discusses the pressures of parenting while in an academic career, which often causes strains on researchers and leads to their departure from academia. All of these documents point to the need for enhanced institutional policies, such as mentorship training, having a paid parental leave policy, and the like, so that postdocs do not feel the intended or unintended pressure to return to work prematurely as well as the importance of high-quality mentorship in creating supportive environments.

Over the past decade, funding agencies such as the National Institutes of Health (NIH) and the National Science Foundation have increasingly focused on the importance of effective mentoring relationships and mentor training and mentoring plans as components of grant proposals. An NIH working group involved in the *Changing the Culture to End Sexual Harassment Report* (2019) called for the institutions to be held "accountable to exceed the standards set by their peers and continuously strive to set a higher bar to create safe, diverse, and inclusive scientific workplaces" by supporting mentor training for faculty, either through funding or by direct implementation (p. 33). This report referenced many of the recommendations outlined in the NASEM report and highlighted the need for the development and evaluation of leadership and mentoring training programs.

Effective Mentoring and Institutional Best Practices

The Science of Effective Mentoring in STEMM (2019) report drew on prior research around mentoring and advising in science, technology, education, math, and medicine (STEMM). While the focus is on the STEMM disciplines, many of the report's findings are applicable to other disciplines, including the social sciences, humanities, and education. These best practices run parallel and often overlap with the issue areas highlighted in the Center for the Improvement of Mentored Experience in Research's (CIMER) *Entering Mentoring* curriculum. The NASEM report identified key factors for effective mentoring and recommendations for mentors as well as for institutions. The major themes outlined for mentors when engaging with mentees included providing psychosocial and career support, establishing and maintaining trust, creating and communicating clear expectations, recognizing and responding

to varying identities, and encouraging multiple mentors. Mentors are also encouraged to self-reflect on their mentoring practices as well as engage in continued education surrounding mentoring best practices. In addition to making recommendations for mentors, the report also included recommendations for institutions. Some of the institutional recommendations included creating systems to provide feedback, reward effective mentorship, support multiple mentors, and engage evidenced based approaches to mentorship. Other institutional recommendations focus on policy and funding approaches, including utilizing a standard definition of mentorship, mitigating negative mentorship experiences, providing funding agency support for mentorship, and supporting scholarship on specific aspects of mentorship and mentoring.

CIMER's curriculum is evidence based and focuses on enhancing understanding of effective approaches to mentoring. It highlights the importance of specific mentoring areas, including enhancing effective communication, creating and aligning expectations, assessing understanding of mentees, addressing equity and inclusion, fostering independence, promoting professional development, and upholding ethics. We (the authors) aimed to address current evidence-based best practices recommendations through inter-institutional and interdisciplinary collaboration.

Mentor Training Collaboration

Faculty mentors of graduate students and postdoctoral scholars frequently learn how to mentor from their own apprenticeship when they themselves were mentees as PhD students and postdoctoral scholars (NASEM, 2019; Pfund et al., 2012). Because most faculty mentors for graduate students and postdoctoral fellows have not received formal training in mentoring, missteps that occur in these mentoring relationships may not result from bad intentions, but rather a lack of mentoring training that would accelerate best mentoring practices and give mentors the tools to enhance their mentoring relationships. While there has been a national movement for formal mentor training to address the common pitfalls that can occur in mentoring, many mentors still report not being aware of these resources (NASEM, 2019).

To address these gaps and create accelerated learning around best mentoring practices, the Office of Postdoctoral Scholars (OPS) at the University of Maryland, Baltimore School of Medicine (UMSOM) and the Office of Postdoctoral Affairs (OPA) at the University of Maryland

College Park (UMD) developed separate mentor training workshops for postdoctoral fellows, graduate students, and faculty. During the COVID-19 pandemic in 2020, in a collaboration initiated by an NSF-funded Alliances for Graduate Education and the Professoriate (AGEP) PROMISE Academy Alliance (APAA), our offices combined efforts to create virtual collaborative inter-institutional mentoring training workshops for faculty at both institutions and for other faculty affiliated with the NSF AGEP PROMISE Academy Alliance. In this article, we will discuss the faculty mentor training workshops that have been offered at UMSOM and UMD that are based on CIMER, how these workshops coalesced from our APAA collaboration, how we moved to virtual delivery due to COVID-19 pandemic, how we designed the workshops, and how we harnessed a virtual format to best meet the needs of the faculty participating in these mentoring workshops.

Mentoring Workshops

The mentoring training workshops were based on *Entering Mentoring* workshops developed by CIMER. These evidence-based workshops engage participants in guided and facilitated discussions on important areas of mentoring relationships to foster more effective outcomes for both the trainee and the mentor (Rogers et al., 2020). Both authors completed the mentor facilitator training. These facilitator training sessions provide an overview and hands-on training focusing on effective mentoring practices for mentors and how to best facilitate discussions.

In the workshops, mentors have the opportunity to engage with various approaches to mentoring, examine case studies, explore potential responses to real world scenarios/situations, and discuss with other mentors how to address challenging situations. The workshops cover communicating effectively, setting expectations, assessing understanding, addressing equity and inclusion, promoting independence, and continuing professional development (Pfund et al., 2012). By engaging these essential topics in an active learning environment, faculty mentors can develop a more mindful mentoring experience that builds upon their previous mentoring experiences. Additionally, sharing of experiences in these workshops is encouraged so that input can be given by the group to address challenging mentoring situations. Having faculty participants who come from differing backgrounds, with varying years of experience, and holding diverse points of view further enriches the workshops. The workshop trainers also can share materials to help enhance mentoring relationships, such as Individual

Development Plans and Mentoring Compacts. It should be noted that those trained to become facilitators in *Entering Mentoring* don't need to be experts in mentoring, because this is a facilitated conversation (Pfund et al., 2012). We found that our experiences in working with and hearing concerns of graduate students and postdoctoral scholars along with being trained in mentoring training workshops by CIMER were helpful for facilitating these discussions.

Genesis of the Collaboration

As part of an initiative to enhance mentoring experiences for graduate students and postdoctoral scholars, mentoring training workshops at UMSOM and UMD were held separately before the collaboration. At UMD, several faculty members and administrators were trained through the National Research Mentoring Network - Committee on Institutional Cooperation Academic Network (NRMN-CAN) mentoring conferences between 2017-2019. The trained faculty were asked to return to their units and provide training opportunities to their faculty. The administrators chose to facilitate the training to postdoctoral scholars through the Center for the Integration of Research, Teaching, and Learning (CIRTL), and it was initially offered as a 12-week online CIRTL course. Subsequently, the first workshop-style courses were offered as two half-day sessions.

At UMSOM, one administrator was introduced to the *Entering Mentoring* program at the National Postdoctoral Association meeting in 2016. Then in 2017 they spearheaded facilitating faculty mentoring training workshops for UMSOM based on the Mentor Training for Clinical and Translational Researchers (Pfund et al., 2012), which is one of the many discipline specific mentoring workshops offered by CIMER focusing on science, technology, engineering, mathematics, and medicine (Pfund et al., 2012). Subsequently, graduate student and postdoctoral fellows' workshops were added in 2018 because these trainees often mentor junior researchers in the lab. Additionally, these workshops can support these mentees to manage their own research mentoring relationships with their P.I.s. The format for the workshops at UMSOM has evolved. Initially launched as six one-hour sessions, they moved to a half-day workshop prior to the collaboration with UMD in 2019.

Collaborative Model for Mentoring Training

In 2019, the authors joined the leadership team for the Maryland AGEP Promise Academy Alliance (APAA.) This NSF-funded program

was developed to assist underrepresented postdoctoral fellows with transitioning into the professoriate at participating schools within the University of Maryland System. As part of initiating a professional development program for the Maryland APAA fellows, it was recognized that an important element of the mentees' training was their interactions with the research mentor. Along with this realization and the move to more virtual learning during the COVID-19 pandemic, we identified an opportunity to offer these important mentoring training workshops jointly through a virtual platform.

Format of the Collaborative Mentoring Workshops

We offer the collaborative mentoring training workshops in four 90-minute sessions once a week for four consecutive weeks (see Figure 1). We found that having time between sessions allows for more reflection on the topics. To accommodate various schedules, we offer the workshops once in the fall, once in the spring, and once again in the summer. We cap the registration for each of these sessions at 30 participants so that everyone can participate in the discussions. The CIMER mentoring training program encourages customization of the program based on the needs of the population. We continue to tailor the program based on feedback we have received from faculty participants as well as adapting to a changing mentoring environment. For example, as more mentor relationships moved to virtual mentoring due to the pandemic, it became more important to talk about how to communicate effectively and interact with mentees in remote settings (Chang et al., 2020: Pfund et al., 2021; Tetzlaff et al., 2022). We also include important current mentoring topics based on current events to raise faculty awareness and jump-start discussions on areas that may be impacting their mentees in their labs (Doyle et al., 2021; Morin et al., 2022; Pfund et al., 2021).

Figure 1
UMB/UMD Collaborative Faculty Mentoring Workshops Sessions

Session 1: Introduction and Effective Communications	**Session 2:** Aligning Expectations and Assessing Understanding	**Session 3:** Addressing Equity and Inclusion	**Session 4:** Supporting Independence and Promoting Professional Development

Virtual Mentoring Workshops

Much as the COVID-19 pandemic forced many mentoring relationships that had been in-person to go remote (Chang et al., 2020; Pfund et al., 2021), it also changed the way the faculty mentoring training workshops were offered. In moving to a virtual platform we wanted to ensure that we maintained interactive discussions, which are essential to this training. To achieve interactivity, we open the workshop series with an icebreaker that helps participants learn more about one another as well as about the facilitators. If there are under 20 participants, one icebreaker we have found particularly insightful is "What is the story of your name?" This type of question provides the participants to share as much (or as little) as they would like about their background. We also created shared slides so that one facilitator can type responses or themes offered during discussions, which substituted for whiteboards that were used in person. This virtual space encouraged discussion and also helped with the flow of the workshops because participants could more easily refer to what had already been mentioned.

We have developed additional icebreaker activities so that sessions could begin with participants sharing about areas that were relevant to the topics of the training. We found that these interventions and making participation an explicit expectation by posing questions were effective in creating an interactive environment in a virtual setting. Moving the mentoring training workshops online allowed for more participation as well as increased interactions between faculty from different campuses. It also created a space where faculty could network and learn from the experiences of those outside of their field and institution.

Faculty from both UMD and UMSOM as well as those from other schools and campuses within the University of Maryland System participated in the workshops. In addition, some faculty outside UMSOM and UMD who are involved in the NSF-funded AGEP Promise Academy Alliance participated to see if this is a model that they would like to implement for their faculty on their campuses. This extended participation was made possible by the online synchronous training format. While recently classes and trainings have been moved back to in-person on our campuses, we are planning to continue offering the workshops online to eliminate the need for travel and promote scheduling convenience. Additionally, we believe that the cross-talk between disciplines, among faculty at multiple stages in their careers, and with the diversity of experiences and views on mentoring represented helps participants to realize how mentoring cultures can vary.

In addition to collaboratively offering mentoring workshops for faculty, we have expanded collaboration to postdoctoral fellows and graduate students on our campuses. We have also been invited to present to postdoctoral fellows and graduate students that serve as mentors in the Louis Stokes Alliance for Minority Participation program at the University of Maryland Baltimore County. The workshops for postdoctoral fellows and graduate students are designed from a trainee's rather than a mentor's perspective so that the experience can be applicable even for those who aren't currently serving in mentoring roles.

Discussion

Over 193 faculty have participated in the mentoring training workshops to date, and 143 of these individuals have participated in the virtual collaborative faculty mentoring workshops (see Figure 2). Overall, the response we have received has been very positive. Having faculty from diverse backgrounds and at different professional experience levels has been beneficial. More experienced faculty bring the longevity of their experience to the interaction, whereas junior faculty bring their recent experience as trainees. The goal is that from these interactions, faculty will create connections with each other and form groups to discuss mentoring issues in the future.

Figure 2
Number of Faculty Participating in the Collaborative Virtual Mentoring Workshop Series

Session/Year	*Number of Participants*
Summer 2022	47
Spring 2022	10
Fall 2021	43
Summer 2021	18
Spring 2021	25

Several benefits have accrued from the collaborative, virtual, inter-institutional faculty mentoring training model. One benefit is that we have two co-facilitators rather than a single facilitator. When designing each section, we actively select which facilitator leads a given a topic and which facilitator does more group management. During each session we switch frequently between who is the facilitator and who is the moderator of the Zoom room. Benefits of the virtual modality include the chat function and other Zoom management features. For example, we use blank PowerPoint slides as whiteboards in which we document aspects of the conversation so all the participants can view them. Additionally, our combined expertise, which encompasses different viewpoints and backgrounds as well as different institutional environments, enriches our ability to facilitate the discussions. Other benefits of the virtual model are increased ability to accommodate faculty schedules as well as faculty being able to join from different geographic locations. Additionally, cross-talk between faculty in different disciplines and institutions enriches the conversations.

One drawback of this type virtual collaborative mentoring training workshop model is the need to be proactive in encouraging participation in a virtual environment. While we strive for active discussions from all participants, we know that some faculty joining may not be willing to participate for a number of reasons. We have mitigated this challenge by using Zoom breakout rooms for small-group conversations in every workshop session and by having periods of time where faculty need to share individually with the entire the group using a call-out or a round robin model.

Multiple areas are under consideration for future developments and innovations. One need is to expand offerings. We are currently a team of only two, yet because of the sensitive nature of the discussion topics and the use of personal sharing, the workshops cannot be recorded. Thus, having additional people at our institutions with expertise in mentorship training would allow us to expand the frequency and timing of the workshops to accommodate increasing demand.

Given that effective mentoring is a lifelong learning process, it would be useful to offer follow ups or other opportunities wherein faculty interact with other faculty after the foundational workshops to address their mentoring concerns. Therefore, a second future direction under consideration is having additional workshops and activities that build upon the mentoring training workshops. We are considering adding stand-alone mentoring enrichment workshops to discuss important mentoring topics in more detail and build upon the CIMER-based

mentoring workshop. Topics under consideration include conflict resolution, the Myers-Briggs Type Indicator, team dynamics, more in-depth and focused conversations around equity, diversity and inclusion (EDI) initiatives to create touch points for faculty to enhance their mentoring practice through continuing development, and acknowledging that effective mentoring should be continually informed throughout the course of one's professional experience.

A future project is to conduct formal IRB studies on outcomes of the workshops with a pre-test and post-test of faculty participants to assess the impact of their participation in the virtual, inter-institutional, collaborative workshop model. We also plan to look at the effects on mentees of mentors who have taken mentoring training workshops and compare their mentoring experiences with a control group of mentees whose mentors have not undergone mentoring training.

There has been recent national attention regarding the mentoring environments that trainees inhabit and the impact of these environments on the trainees themselves (AAMC, 2021; Gewin, 2022; NASEM, 2019). Thus, offering mentoring training workshops to accelerate best mentoring practices and moving away from the apprenticeship model may help retain doctoral students in academia. With institutions placing increased emphasis on the importance of mentoring relationships and creating a foundation for best practices, workshops like these could help move the needle by addressing negative areas and facilitating more positive spaces.

The combined virtual model of mentoring training workshops based on CIMER's *Entering Mentoring* model has increased our capacity to reach more faculty, created cross-talk between our campuses and disciplines on mentoring norms, and helped suggest future directions that we could pursue in mentoring training. We believe this collaborative virtual mentoring training workshop model can be implemented at other institutions to help create a more mindful mentoring practice for faculty, graduate students, and postdoctoral scholars. We encourage readers to consider how this model can be implemented on their own campuses.

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