

Improving Mentoring Relationships in Science: Mentors Need Mentors

Dr Christine Pfund



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Dr Christine Pfund is a researcher at the University of Wisconsin-Madison, USA. With a strong network of colleagues and collaborators, her work focuses on developing, implementing, documenting, and studying interventions to optimise research mentoring relationships across science, technology, engineering, mathematics, and medicine. Read on to discover how the success of these initiatives has resulted in the development of a national network of mentors in the USA.

Mentors in Science

Mentors play a critical role in developing the careers of junior scientists. A good mentor inspires, encourages, and supports their mentee. This commitment is especially important for those from traditionally underrepresented groups in science who typically receive poorer quality mentoring than their non-minority peers.

The benefits of mentoring are clear. Mentored graduate students are more likely to publish their research and report greater career satisfaction. Benefits have also been identified for mentors themselves, including increased productivity, sense of fulfilment, and refinement of leadership and other key skills, in addition to their existing subject-specific expertise.

Unfortunately, in some cases, the mentor-mentee relationship is unsuccessful, resulting in a detrimental impact on the happiness and motivation of both parties. This circumstance may be due to a lack of training and support offered to mentors; despite its critical importance, mentors typically learn by example, trial and error, and peer observation.

Dr Christine Pfund at the University of Wisconsin-Madison (UW), along with her colleagues and collaborators, places particular focus on optimising the mentoring relationships that occur in the research context. Currently, this team is leading several national programs based at the UW, including the National Research Mentoring Network (NRMN) and the Center for the Improvement of Mentored Experiences in Research (CIMER). By using evidence-based curricula and approaches to foster the persistence and success of a diverse group of trainers, mentors, and mentees, the team focuses on aligning expectations and strengthening communications for mentoring relationships.

The team has also developed a strong, collective scientific foundation for research mentor and mentee training that includes both face-to-face and online delivery across a variety of disciplines and career stages. Indeed, their work is supported by a convincing track record of success in creating, implementing, publishing, and rigorously investigating interventions for scholars from diverse groups and their mentors.



Dr Pfund leading a mentor training workshop'



Drs Pfund, Sorkness, Byars-Winston and colleagues at the University of Wisconsin-Madison

UW Madison as a National Mentor Training Hub

The National Institutes of Health (NIH) is supporting the Diversity Program Consortium (DPC) to develop new approaches to engage and support researchers from populations which are underrepresented in biomedical sciences. Due to the established

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Dr Pfund and two NRMN Master Facilitators discussing ways to improve mentor training curricula

national reputation of Dr Pfund and her colleagues in the field of mentorship, the University of Wisconsin-Madison (UW) became a national hub for research mentor and mentee training for the National Research Mentoring Network (NRMN), part of the DPC.

The NRMN aims to provide all researchers, regardless of their position or background, access to evidence-based mentorship, professional development, and networking opportunities. The main aims of the project in its first phase were to: 1) increase access to mentoring across career stages; 2) improve mentoring relationships through training; 3) increase access to research resources and career development, and 4) promote the value of mentoring. As a nationwide project, the overarching goal is to assist in the development and expansion of a diverse, high-quality biomedical workforce.

As one of the NRMN Principal Investigators, Dr Pfund and the NRMN team developed training materials for both mentors and mentees with a focus on attributes known to impact mentee persistence, including cultural awareness. The team also assembled a group of 32 Master Facilitators who have collectively trained over 6000 mentors across the country. Starting in July 2019, Dr Pfund will launch the NRMN Coordination Center, which will support eleven NRMN research projects and a resource center to catalyse long-term potential across the collective. Dr Pfund and colleagues have also been involved in building capacity for training beyond NRMN, teaching others to implement evidence-based mentor and mentee workshops, and to further extend the reach of the initial programme.



Dr Pfund and the NRMN Master Facilitators

Additional Training for Mentors and Mentees

Dr Pfund and the team are actively involved with other training programs, both at UW and at other institutions, aimed to establish, foster, and promote effective mentoring relationships at a broader level. For example, at UW, they lead mentor and mentee training efforts at the Institute for Clinical and Translation Research and are part of efforts to optimise the mentorship training provisions for graduate students, post-doctoral trainees, and

junior faculty for this and other programs. As part of their work, the team is also developing and testing new training modules and assessment tools.

Dr Pfund also directs the Center for Improvement of Mentored Experiences in Research (CIMER; www.cimerproject.org) at UW. Here, the focus is on the development, implementation, and evaluation of mentor and mentee training using theoretically grounded, evidence-based, and culturally-responsive training interventions and investigations. One element of this work involves making evidence-based curricula available to the public. Another element is the development of a platform which can be used to assess researchers' mentoring experiences both in mentor and/or mentee training as well as in their mentoring relationships.

As part of their national efforts through CIMER, Dr Pfund and colleagues are implementing and testing an integrated mentor-mentee training package in partnership with the Howard Hughes Medical Institute as part of the prestigious Gilliam Fellowships for Advanced Study. Gilliam scholars engage in an evidence-based session at their annual meetings to support effective and proactive navigation of their mentoring relationships. Mentors of the Gilliam scholars engage in a full year of culturally responsive mentor training which includes face-to-face meetings, online modules, and other resources, all with the aim of fostering an environment where mentors can learn and support their peers.

How and Why Do Mentoring Relationships Work?

It is important to understand how and why mentoring relationships work from a solid theoretical perspective. Dr Pfund and colleagues have investigated several frameworks to inform future practice. These conceptual frameworks consider, for example, what factors are associated with academic persistence and career attainment. They provide a means of understanding the relationships between these factors and experiences, such as mentoring. Social cognitive career theory is one framework that helps explain these factors as potential mechanisms underlying key factors in motivation to reach a specific career goal.

Other frameworks of importance to Dr Pfund and the team include science identity development and social negotiation. These frameworks aim to explain how an individual adopts his/her professional identity and social capital. However, to advance the science of mentorship and understand what works for whom and in what context, more research is needed to determine the most appropriate metrics for assessing mentors, mentees, and mentoring relationships. This question requires further research, and is one of the goals of the NIH Diversity Program Consortium.

Research is also needed to understand the process by which evidence-based approaches in mentoring, such as Entering

Mentoring, are disseminated and implemented on a national scale. A recent article by the UW team, led by Kim Spencer and colleagues, describes the approach the team used for national scale-up. Using these approaches, the team has trained more than 600 facilitators nationwide. The majority of these facilitators went on to implement mentor training for more than 4000 other researchers.

It is important to also note that barriers still exist to implementing research-mentor training. These can include a lack of support and resources, including training materials, personnel for planning and organising training, dedicated time for training, and a lack of confidence in implementation. However, outcomes from facilitator training sessions have revealed that having attended, delegates report more confidence and preparedness, and also reported that the opportunity to develop connections with other delegates was invaluable.

Key Findings

When asked what the key findings of current and past projects were, Dr Pfund identified the following take-home messages:

1. Mentor and mentee training interventions can improve the knowledge and skills of both mentors and mentees, and improve the effectiveness of mentoring relationships.
2. Despite evidence supporting the importance of mentoring, it remains unclear which mentoring relationships have the most impact. What specific factors best account for key outcomes in mentoring success? Critically, mentoring relationships do not occur in isolation – they are inherently woven into the social and cultural contexts of individuals and their academic institutions.
3. Facilitator training/train-the-trainer workshops are a demonstrably effective means of national dissemination and capacity-building.
4. Critical factors, known to impact mentees persistence and development in their careers, can be incorporated into mentor and mentee training. In this way, mentors and mentees are better able to address these factors in their relationship(s).

We can clearly see how the work of Dr Pfund and her colleagues benefits all – mentors, mentees, and the scientific workforce more generally. As Dr Pfund notes, 'Mentoring is known to be a critical factor in the satisfaction, productivity, and advancement of researchers across career stages.'

By building, improving, and evaluating the relationships between mentors and mentees, this work is playing a critical role in shaping the success of research establishments from local to national levels within the USA, with potential for application even further afield.



Meet the researcher

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Dr Christine Pfund is a Senior Scientist at the Wisconsin Centre for Education Research at the University of Wisconsin-Madison (UW). She is also director of the Centre for the Improvement of Mentored Experience in Research (CIMER) at UW, one of the principal investigators of the National Research Mentoring Network (NRMN). Dr Pfund completed a PhD and post-doctoral projects at UW and served as the Associate Director of the Delta Program in Research, Teaching, and Learning and the Co-Director of the Wisconsin Program for Scientific Teaching for more than a decade. Dr Pfund's work is conducted in collaboration with an established network of colleagues and collaborators, focusing on the development of mentor-mentee relationships across several academic disciplines. Currently, Dr Pfund is co-leading multiple 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. She is a member of the National Academies committee that recently published the consensus report and online guide, The Science of Effective Mentorship in STEMM.

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FURTHER READING

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