PERSPECTIVE

Cultivating Medical Education Research Mentorship as a Pathway Towards High Quality Medical Education Research

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The lack of effective and consistent research mentorship and research mentor training in both undergraduate medical education (UME) and graduate medical education (GME) is a critical constraint on the development of innovative and high quality medical education research. Clinical research mentors are often not familiar with the nuances and context of conducting education research. Clinician-educators, meanwhile, often lack the skills in developing and conducting rigorous research. Mentors who are not prepared to articulate potential scholarship pathways for their mentees risk limiting the mentee's progress in early stages of their career. In fact, the relative paucity of experienced medical education research mentors arguably contributes to the perpetuation of a cycle leading to fewer well-trained researchers in medical education, a lack of high quality medical education research, and relative stagnation in medical education innovation. There is a path forward, however. Integration of doctoral-level educators, structured inter-departmental efforts, and external mentorship provide opportunities for faculty to gain traction in their medical education research efforts. An investment in medical education research mentors will ensure rigorous research for high quality innovation in medical education and patient care.

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The recent report from the Institute of Medicine (IOM)[1] calling for finance reform for graduate medical education based its findings on evidence within medical education, while simultaneously acknowledging that there was a limited amount of such evidence. In response, Asch & Weinstein[2] noted that the paucity of medical education research and funding for such research "reflects a systematic lack of research investment in an area of health care that we believe deserves better." However, inadequate funding is only one aspect of the complex problem of increasing the quality and quantity of medical education research (MER). To cultivate the high quality MER that can support critical decision-making, medical education must focus on the development of highly qualified MER mentors.

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NEED FOR MEDICAL EDUCATION RESEARCH MENTORS

Research mentors are critical to the success of junior investigators engaging in medical education or clinical research.[3], [4] Residents and junior faculty need research mentors to help them develop their research skills and to encourage them to establish the link between theory and practice.[4] This research mentoring relationship is even more critical for female and minority novice investigators, for whom effective mentoring can have exponential effects on their willingness to engage in research.[4] Not surprisingly, having a research mentor has been identified as a strong indicator to publishing and obtaining grants.[5] Yet, mentors also help junior investigators navigate "hidden rules" of scholarship[6] and identify pathways towards development.[7] "Unless you already have significant research experience," writes Chin et al.[6] to junior investigators, "you will not go far without a good mentor."

While the need for mentorship is similar among both novice clinical researchers and novice medical education researchers, there are nuanced differences between clinical research and MER, such that the translation of clinical research skills into MER is not direct.[8] While all research should be guided by core principles, the application of those principles will necessarily be different given the focus of scholarship related to discovery and teaching.[7], [9], [10] For example, in MER, *constructs* frequently serve as primary outcomes, which require clear definition and valid measurement. Creation of survey instruments "on-the-fly", as is frequently done, is woefully inadequate. Traditional training in clinical research focuses largely on study design and statistical analyses to aid in study interpretation, but seldom even touch on the complex science of questionnaire construction and validation.

Mentorship relies on the ability of mentors to align their expectations with the expectations of their mentees and cultivate mentees' development.[11] Fundamentally, all research mentors should provide clarity to the development of an appropriate research question, and help navigate the inherent challenges associated with design, implementation, and

interpretation. However, a clinical research mentor is likely to interpret these challenges differently than a mentor experienced in MER. Where clinician researchers may be adept at understanding the relationship between basic science and patient outcomes, they are likely poorly equipped to make that same association between educational interventions and patient outcomes. This does not imply that these associations will be realized, but rather, that a trained medical education researcher will know how to investigate these associations and will be more likely to develop innovations that either directly or indirectly improve patient care. For example, simulation training and development of mastery learning has had clear impacts on patient care, and promotes the concept of educational research as translational science.[12] While clinical research mentors may have a wealth of experiences, they may not be able to align their expectations, nor fully cultivate the skills of junior medical education researchers. Thus, just as there are specific limitations in the application of clinical research knowledge to MER, there are also limitations in how effectively a clinical researcher can mentor a novice medical education researcher.

Importantly, novice medical education researchers may be unaware of the various types of scholarship or opportunities for MER, and this lack of knowledge has been identified as a significant barrier to scholarly activity.[13] Mentors who are not prepared to articulate potential scholarship pathways for their mentees risk limiting the mentees' progress in early stages of their careers. In addition, mentors outside the field of medical education often do not have access to the same support networks and key stakeholders to develop collaborative relationships across institutions and organizations.[6]

Medical educators without specific expertise in MER may not possess the necessary knowledge or experience to serve as a mentor to novice medical education researchers. The relative paucity of experienced MER mentors arguably contributes to the perpetuation of a cycle leading to fewer well-trained researchers in medical education, a lack of high quality MER, and relative stagnation in medical education innovation.[2]

WHY AREN'T THERE MORE MEDICAL EDUCATION RESEARCH MENTORS?

Many institutions view medical-educators as "teachers" and clinical researchers as "researchers," which may be because promotion committees are variably prepared to recognize a career path for faculty primarily engaging in MER, who blur the line between the "mutually exclusive" career pathways of the clinician-educator and clinician researcher.[14, 15]

In fact, while there is great variability in the defined role of the clinician-educator, there is solidifying agreement that this role includes a component of educational scholarship, which may be research but is also presentations, workshops and educational products, such as curricula or evaluations.[16, 17] This encompassing definition ensures that clinician-educators are appropriately recognized for their myriad of contributions. However, nearly half of a group of General Internal Medicine Chairs surveyed still reported that peer-reviewed publications were "most or very important" in the promotion decisions of these faculty.[17] Among this same group, 60 % responded that research mentorship was a resource that was not available for clinical-educators or was something that faculty sought on their own. Thus, while clinician-educators are encouraged to have a diverse portfolio of scholarship, research and publications are still prime promotion currency, despite lack of mentorship.

The call from Levinson and Rubenstein,[18] who noted the need to develop medical education researchers among clinical faculty is still relevant. They called for efforts of formal training, dedicated research time, and external funding to cultivate these experts in MER. Such medical education researchers, they noted, would be needed to drive innovation, promote discovery, and advance rigorous examination of educational practices. Mentorship is a key element for cultivating an education research environment,[19] and lack of mentorship stifles it.

To wit, the Netherlands has seen a boom in MER activity in the past two decades, ranking fifth in countries with the most publications and first in most publications per capita.[19] In reflection of that growth, Jaarsma et al.[19] point to a series of factors that have cultivated this rich education research environment, including local advocacy for MER at each institution in the form of a chair in medical education, specific professional development opportunities in education research for junior faculty, a culture of inter-institutional collaboration, and a specific Ethical Review Board just for MER.

In the United States, however, most clinician educators develop skills ad hoc in assessment, feedback, and teaching within and after their residency training programs, but rarely receive such rich environmental support or mentorship to accomplish MER. In the last 10–15 years, there has been an increase in opportunities for medical educators to pursue additional training. Many institutions have established fellowship programs in medical education or medical educator academies, but most focus on the development of leadership skills and emphasize the improvement of teaching skills over MER training, while only providing a supportive role for educational research efforts.[20–22] These programs use terms like "strengthen", "promote", and "foster" in relation to teaching and innovation, while "encouraging" scholarship. This may only be a semantic difference, but language is powerful. In fact, fellowship programs are often designed to develop skilled teachers, whereas mentorship and scholarship are not necessarily considered core competencies for a medical educator.[23, 24] For those who do receive training in MER, they may not have the additional time or access to mentor their colleagues.

Interested clinician educators may pursue master's degrees in medical education, but often do so through online courses for a variety of reasons, including lack of access to mentors.[25] Individuals interested in pursuing doctorate degrees in medical education are limited even further, with only a handful of programs in existence in the U.S.[26] Certainly, if clinician educators had the opportunity for dedicated time to obtain an advanced degree, doctoral programs in medical and health professions education would likely offer the best opportunity for mentoredresearch.[26] Graduate training, particularly at the doctoral level, builds in a component of rigorous research,[26] appropriate for education research mentorship, and these programs will go far to provide new opportunities and expectations for novice medical education researchers. There is some concern that despite efforts to train medical education researchers, the lack of mentorship in the field may be self-reinforcing; clinician educators with access to mentors do not report being mentored as often as clinician-researchers.[27], [28] Still, MER is gaining traction around the world,[29] and concerted effort to find mentors is necessary.

THE PATH FORWARD

Though mentorship for medical education researchers is variable across institutions, there is light on the horizon. In fact, there are many opportunities that, with a small investment, have a great return at the institutional level. One opportunity for improved mentorship is to employ a PhD-educator. PhD-trained educators are increasingly joining the medical education system in a variety of positions on clinical and university campuses, to cultivate rigorous education and education research. A recent list on the Job Board for the Society for Directors of Research in Medical Education (http://www.sdrme.org/positions.asp) showed seven available positions, with six requiring a master's or doctoral degree in education. These educators, trained in areas such as educational psychology, higher education, or education research, provide a great resource for MER mentorship, and bring a unique set of skills to mentor clinician-educators in components of education research.

Second, inter-departmental collaboration should be encouraged to create a recognized forum for mentorship and collaboration in MER. Drawing on examples such as The Academy at Harvard Medical School (http://hms.harvard.edu/departments/academy), or Duke AHEAD at Duke University School of Medicine (http://medschool.duke.edu/faculty/duke-ahead), institutions can harness the power of a critical mass of medical education researchers to engage in institutional initiatives, cultivate educational innovations, and mentor junior faculty. Significantly, these programs have explicit goals and objectives related to MER as an integral part of the curriculum, which make them an ideal model to pursue in the development of a robust cadre of medical education researchers with the skills to serve as future mentors.

More locally, program directors and core faculty can encourage residents and junior faculty to seek external mentorship for research when they are unable to provide it themselves. The annual conferences for organizations supporting MER (e.g., AAMC Med Ed Meeting; American Education Research Association, Division I; or the Association for Medical Education in Europe) attract rigorous education researchers who may have similar interests, and may be willing to provide guidance to a junior investigator.

Alternatively, a curriculum in MER can be implemented. The School of Medicine at Georgetown University leads the way in taking medical education scholarship to the next level with its MER scholar track. This program consists of an explicit, longitudinal curriculum, and supports the concept of educational research as translational science, through an understanding that "innovative medical education methods are needed to provide exemplary patient care." (https://som.georgetown.edu/academics/merst)

At the GME level, several residency programs are transitioning from a resident-as-teacher to a true clinician-educator track with explicit goals and objectives related to MER, such as a pilot clinician educator track within a psychiatry residency that has an explicit expectation to produce quality scholarly work.[30] More recently, the internal medicine residency at Beth Israel Deaconess Medical Center has developed a clinician educator track to "master (the) skills necessary to investigate educational topics and disseminate scholarly work."[31] Although this program is just beginning, graduates have been highly satisfied and consider it to be a significant improvement over previous resident-as-teacher programs.

Creating adequate career paths for clinician educators to become education research mentors is necessary in order to encourage progress in medical education. Developing highly trained researchers ensures mentorship for continued high quality MER, necessary for robust innovations in medical education and patient care.

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