Needles and Haystacks: Finding Funding for Medical Education Research

Larry D. Gruppen, PhD, and Steven J. Durning, MD, PhD

Abstract

Medical education research suffers from a significant and persistent lack of funding. Although adequate funding has been shown to improve the quality of research, there are a number of factors that continue to limit it. The competitive environment for medical education research funding makes it essential to understand strategies for improving the search for funding sources and the preparation of proposals. This article offers a number of resources, strategies, and suggestions for finding funding. Investigators must be able to frame their research in the context of significant issues and principles in education. They must set their proposed work in the context of prior work and demonstrate its potential for significant new contributions. Because there are few funding sources earmarked for medical education research, researchers much also be creative, flexible, and adaptive as they seek to present their ideas in ways that are appealing and relevant to the goals of funders. Above all, the search for funding requires persistence and perseverance.

The lament over the paucity of funding for medical education research (MER) is long-standing and persistent. Two decades ago, recommendations for improving the quality of MER recognized the lack of funding as a serious problem.[1] Subsequently, the positive association between study quality and funding levels was documented empirically by Reed and colleagues,[2] demonstrating that funding above $20,000 had a moderately large effect on study quality (effect size [d] = 0.4). Nonetheless, the funding problem continues to plague the field, with recent reports that two-thirds of published studies in MER are not funded by outside institutions and that those that are funded are still seriously underfunded.[3] Indeed, many proposed solutions for improving the quality of MER, such as more complex studies with multiple institutions, and sophisticated measurement and research designs,[4] would also increase the price tag for such studies and exacerbate the funding problem.

L.D. Gruppen is professor, Department of Learning Health Sciences, University of Michigan Medical School, Ann Arbor, Michigan.

S.J. Durning is professor, Department of Medicine, Uniformed Services University of the Health Sciences, Bethesda, Maryland.

Correspondence should be addressed to Larry D. Gruppen, Department of Learning Health Sciences, 219 Victor Vaughan House, 111 E. Catherine St., Ann Arbor, MI 48109-2054; telephone: (734) 936-1662; e-mail: lgruppen@umich.edu.

The State of Funding for MER

This lack of funding creates a negative feedback loop whereby the quality of MER suffers from lack of funding, but increased funding is only likely to arrive if the research demonstrates its value, which it cannot do because of quality limitations. This negative feedback can be seen in criticisms that MER does not demonstrate direct benefits for patient outcomes,[5,6] which cannot be demonstrated without significant research funding. Similarly, MER grants rarely reimburse indirect expenses for administrative overhead and often require matching funds from the applicant institution. As a result, some medical school departments refuse to even accept such grants, with chilling effects on MER quality.

In spite of the lack of funding, journals and conferences devoted to MER have proliferated over the past two decades. To some degree, this phenomenon reflects the fact that MER is, relative to biomedical research, fairly "easy" to do.[7] No special laboratory facilities are needed; randomized controlled trials, which are the gold standard for research in biomedicine, may not even be appropriate for many medical education studies[8]; and much MER is done without adequate training in research skills (although this is changing rapidly[9,10]). The result has been far too many "convenience studies" that are poorly designed, inadequately powered, and theoretically empty. That this also erodes the quality and perceived value of the resultant research should be obvious.

Not only the field, but also the individual researcher, suffers from this lack of funding. If one has identified medical education as a significant part of one's career path, it is often difficult to gain recognition for the value of that work if one doesn't receive extramural funding. Lack of funding also directly impacts capacity for work. External funding helps protect the time of investigators to devote more attention and care to their research. It also enables the recruitment of specialized expertise in measurement, study design, or data analysis. Funding can provide for larger sample sizes, multi-institutional collaborations, and longer-duration studies. A lack of funding hampers all of these things and leaves the prospective medical education researcher vulnerable to the ever-growing demands for clinical productivity. Although good MER can and has been done without formal grant funding, we suspect that faculty use of their departmental resources and their own "spare" time is not a sustainable model.

We believe that the lack of funding for MER is the result of the persistence of several arguments of questionable defensibility. Education and, by extension, educational research is often seen as the responsibility of the individual schools (e.g., "that's why they charge tuition") rather than the larger society. It is part of the quality improvement process in which every medical school is expected to engage to maintain accreditation.[11]

Education (and educational research) is torn by debates about whether it is a private or public "good,"[12,13] which impacts the willingness to fund research on something that has ambiguous value for the public rather than the individual. It is significant that education in science, technology, engineering, and mathematics (STEM) disciplines receives much greater federal funding from the National Science Foundation than medical education receives from the National Institutes of Health (NIH). This reflects the differing perceptions of society about the balance between public and private good represented in medicine and the STEM disciplines.

Further, the potential benefits of improved education are likely to manifest themselves over a broad set of outcomes and competencies (e.g., increased medical knowledge, better interpersonal communication, improved understanding of systems-based practice[14]) that do not manifest themselves in knowledge about specific diseases. This sets MER at variance with the current, disease-focused structure of most funding agencies, such as the NIH.

Regardless of the causal dynamics, the funding for MER is limited in number of sources and in amount. The result is enormous competition for the limited funding available. Indeed, many MER grants are as competitive as NIH grants. For example, the Stemmler Fund awards between one and three grants annually from approximately 50 applications for a funding rate of less than 6% (based on data from the Stemmler Web page[15] and from Spector[16] compared with the 21% overall success rate for NIH grants[17]).

Looking in the Right Haystack

Although daunting, the search for funding "needles" is important and potentially rewarding. To begin, one should first identify a haystack that may contain such needles. This search is challenging because MER encompasses such a large array of problems. A brief overview of the studies published in a single recent issue of a major MER journal reflects research on educational innovations, health care workforce, professional identity, defining and assessing competencies, educational leadership, health care economics,

feedback, international health care, and candidate selection, among many others. The diversity of MER topics means that there are many sources for potential funding, although few are directed specifically at MER.

Public granting agencies, such as the NIH[18] and the Agency for Healthcare Research and Quality[19] (Table 1), have very broad and comprehensive research portfolios, generally larger budgets, targeted requests for research proposals, and regular grant review cycles. Private foundations, in contrast, are often much smaller and tend to focus their resources on specific problems or issues and may accept proposals throughout the year. Funders also vary in the scope of the problems in which they are interested. Some are specifically concerned with international health issues, whereas others may concentrate on a local community. Specialty societies may have small educational grants programs that are restricted to members of that specialty. Some funders are interested in research on education generally, whereas others focus their attention on specific types of learners (e.g., residents or physicians in practice).

There are a few funding sources specifically intended for medical education, such as the Stemmler Fund,[15] the Association for Medical Education in Europe,[20] and the Association of American Medical Colleges national and regional Groups on Educational Affairs.[21] Other funders will often consider MER proposals as part of their larger portfolio of funding priorities. Corporate funding may also be possible through corporate philanthropic foundations or directly with the company.

The American Medical Association's recent Accelerating Change in Medical Education[22] offered $11 million in a competitive grants program to transform the way physicians of the future are trained. This is an interesting example of funding for MER because it highlights the team-based nature of MER (grants were given to 10 schools rather than to individual investigators). Such large amounts of money for MER are rare. Much more common are small grants programs that may be available through professional associations and societies or through the medical school or university.

These can be excellent sources for startup funding and preliminary data that can be leveraged into more competitive applications for large grants from national sources.

A growing number of online databases and clearinghouses can facilitate the search among these disparate organizations (Table 2). Many institutions support a health sciences library and informationists who can be invaluable for finding these search resources and providing guidance on their effective use. Many databases allow saved searches and weekly e-mail alerts based on these searches to facilitate monitoring of new funding opportunities. However, many of these excellent resources require subscription fees and are accessible only to members of institutions that pay for subscriptions.

Finding the Needle

There are, of course, numerous resources available online, in print, and in workshops for ways to improve grant applications, plan studies, administer awards, sell ideas, and almost any other aspect of the funding search process. Most institutions have similar resources, guidance, and support. To supplement these, we offer several suggestions to improve the likelihood of finding a needle that the authors have garnered from numerous successful and unsuccessful attempts.

Before the proposal

Be adaptable. There are two logical strategies for guiding the search for MER funding. One is to develop a clearly stated research program around a specific idea and search for a funder who will support that research. The converse strategy is to first search for a funder who is willing to invest in a general area of interest and then develop a research program that addresses the funder's goals and priorities. Although we have pursued both of these strategies, we believe it is more common (and more effective) to combine these extremes, working from both the researcher's specific interests and the funder's priorities to craft a proposal that enables the researcher to advance his/her research program while also providing useful and valued research results to the funder. This middle strategy requires researchers to maintain a broad perspective on their domain of interest and not become too narrow in determining how they can study it. It

Table 1

Partial Listing of Sources of Funding for Medical Education Research

Resource	URL	Comments
Stemmler Fund	http://www.nbme.org/research/stemmler.html	Provides support for research or development of innovative assessment approaches that will enhance the evaluation of those preparing to, or continuing to, practice medicine
Arnold P. Gold Foundation	http://humanism-in-medicine.org	Works with health care professionals in training and in practice to instill a culture of respect, dignity, and compassion for patients and professionals
Robert Wood Johnson Foundation	http://www.rwjf.org	Fosters environments that promote health and on improving how health care in America is delivered and paid for, and how well it does for patients and their families
Josiah Macy Jr. Foundation	http://macyfoundation.org	Dedicated to improving the health of the public by advancing the education and training of health professionals
Association for Medical Education in Europe	http://www.amee.org/awards-prizes/research-grant-award-programme	Promotes scholarship in health care professions education to advance knowledge and best practices in education as well as to build a community of scholars working in the field
Association of American Medical Colleges	https://www.aamc.org/members/gea/	Advances medical education and medical educators through faculty development, curriculum development, educational research, and assessment in undergraduate, graduate, and continuing medical education
W.K. Kellogg Foundation	https://www.wkkf.org	Works with communities to create conditions for vulnerable children so they can realize their full potential in school, work, and life. Guided by the belief that all children should have an equal opportunity to thrive
Spencer Foundation	http://www.spencer.org	Supports high-quality investigation of education through its research programs and strengthening and renewing the educational research community through its fellowship and training programs and related activities
Centers for Disease Control and Prevention	http://www.cdc-cafunding.org	Supports research and education projects in a broad spectrum of health professions and emphasizes public health problems
United States Agency for International Development	http://www.usaid.gov/	Partners with a variety of organizations to support and implement a wide range of development programs around the world
Agency for Healthcare Research and Quality	http://www.ahrq.gov	Supports a wide variety of research to improve the quality, effectiveness, accessibility, and cost-effectiveness of health care
Fogerty International Center	http://www.fic.nih.gov/	Supports global health research, building partnerships between health research institutions in the United States and abroad, and training the next generation of scientists to address global health needs
Health Resources and Services Administration	http://www.hrsa.gov	Provides grants to improve and expand health care services for underserved people
National Institutes of Health	http://www.nih.gov	Supports a wide range of biomedical and clinical (and sometimes educational) research through various institutes
U.S. Department of Veterans Affairs	http://www.va.gov/finance/policy/gms.asp	Funds research on the health care of U.S. military veterans, including quality assurance and improvement innovations

also requires diligence in searching for potential funding sources and creativity in translating the goals of the funder into questions that also fit the researchers' domain of interest.

Bundle MER with other research projects. Even when a grant proposal is for a biomedical or clinical study, it may be feasible to include MER as a component or ancillary study. For example, a large NIH center (P) grant in diabetes or Alzheimer's disease may provide opportunities for the study of educational questions related to patient empowerment, provider decision making, or team training. Training grants (F and T programs in the NIH) and career development awards are particularly well aligned with educational studies of the training process or curricular initiatives. The growth of translational and team science also lend themselves to MER on group interactions, communication, and the dissemination of innovations. This strategy for funding MER works even if the educator is a member of a collaborative team, rather than the principal investigator. Indeed, a medical educator brings valuable expertise to the larger project and may be able to pursue special MER in the context of the larger biomedical initiative.

Develop research skills. Interesting and important ideas are necessary but not sufficient for getting funded. Rigorous, fundable research requires sophistication in research design, methodologies, data-gathering quality, and analytic procedures. Many hopeful researchers have experience as "consumers" of MER, but they are now seeking to become "producers" of that research.[23] This is a shift that often requires some level of additional education through local institutional workshops or courses, programs such as the Association of American Medical Colleges Medical Education Research Certificate program,[24] or, optimally, through master's and PhD degree programs in health professions education.[9,10]

Table 2
Partial Listing of Research Funding Databases for Medical Education Research

Database	URL	Comments
Grants.gov	http://www.grants.gov/web/grants/search-grants.html	Provides a centralized location for federal funding opportunities. Contains information on over 1,000 grant programs. This resource centralizes funding announcements that are difficult to find in individual agencies.
Pivot (formerly known as Community of Science)	http://pivot.cos.com (requires institutional or individual subscription)	Provides access to funding opportunities globally. It is not limited to educational research.
SPIN (Sponsored Programs Information Network)	http://infoedglobal.com (requires institutional or individual subscription)	Primarily targets institutions of higher education and currently contains information from more than 2,500 different sponsors.
Foundation Directory Online	https://fconline.foundationcenter.org (requires institutional or individual subscription)	Provides a comprehensive database for finding foundation support. Includes records for 100,000 grant makers and over 500,000 grants. Updated weekly.

Be prepared. Opportunities for funding appear from surprising directions and at unpredictable times and provide only the briefest of lead time for a proposal. Starting a research proposal from nothing is seldom feasible in such situations, so it is necessary for medical education researchers to be ready to take advantage of these serendipitous opportunities. This means having ideas clearly in mind, collecting references and related work that could be useful, having pilot data or preliminary studies that can demonstrate the ability to do the research, and maintaining a network of potential collaborators and consultants.

While writing the proposal

Investigate the funder. It is important to find out what other projects the funder has funded as an indication of their interests. Contacting a previous recipient of a grant from that funder can be valuable for understanding the application process and particular requirements. It is unwise to ask for more money than the agency can realistically provide—excessive budget requests are easy to reject. Similarly, asking for funding for costs that are not permitted suggests that the researcher has not read the instructions or guidelines from the funder. Although not all funders have the staff available to respond, it is generally very helpful to call the agency to explore interest in one's idea. Program officers at the NIH are prime examples of people who will help by providing feedback on research ideas and how these ideas fit the goals of the institute. Some funders do this through letters of intent, but even then, a quick conversation with a representative of the funding agency can be invaluable in saving time and effort if the research idea does not fit the agency priorities and can help focus the study to make it a better fit.

Build a research team. Writing a funding proposal is difficult and time-consuming work. Sharing that work with colleagues makes it much more palatable and likely improves its quality. Collaborators can help watch for funding opportunities, provide complementary areas of expertise, supply access to a broader professional network, and offer encouragement when proposals get excoriated by reviewers. International collaborations can be especially powerful in some contexts.

Be relevant. It is important to know what the funder is interested in and highlight how one's research addresses that problem. This may be done by framing a larger research interest in terms of a specific problem. For example, a larger interest in how practitioners become aware of and adopt new innovations may fit within the current spread of electronic medical records and how this technology might influence the dissemination of innovations. Similarly, for any funder, it is important to identify a practical problem for the application of one's larger research topics. Most funders are more interested in solving a problem than in basic and theoretical study in education (e.g., understanding the problem). However, the importance of a solid theoretical or conceptual framework cannot be diminished. Among other things, theory provides a framework for describing and untangling complex social and educational phenomena and is essential to advancing our understanding. Theory development may not be feasible as the primary purpose of many grants, but it can and should be considered as one of the subsidiary aims of the project. Examples of using theory and targeting larger MER interests include exploring clinical reasoning with contemporary theory and biologic methods, sleep and decision making, and well-being.

Submit high-quality work. Unfortunately, too many applications for scarce funding have the obvious hallmarks of being assembled at the last moment. They contain misspellings, missing sections, conflicting information, and editorial comments that were not removed. Submitting an unpolished proposal is largely a waste of time for the investigator, reviewers, and funders. This being said, the best can be the enemy of the good, and the paralysis of perfection will prevent the completion or submission of a proposal, which is equally ineffective. The competitive nature of MER funding means that a researcher needs to do everything possible to ensure quality research. This starts with a clearly stated research question, substantiated by a theoretical framework and built on prior research and literature. Multi-institutional collaborations are often beneficial for ensuring that results are not too specific to a single setting.

Think big. Although any study can be constrained by issues such as location, subjects, or time, it is important to convince the funder that the study addresses a larger problem that will have implications for others and make a difference. Fundamental questions about education can still be addressed even in small studies. Communicating the larger questions is facilitated by a concise and pithy "elevator speech"—a brief, carefully crafted verbal or written description of the essential question and the study.

Get peer review before the peer review. Although most researchers consider the feedback provided by grant reviewers to be useful as formative feedback for another submission, it is almost always better to get feedback before submitting a proposal.

This saves time, reduces the need for resubmission, and improves the odds of getting accepted. Even one critical review from a colleague can be enormously helpful in pointing out unfounded assumptions, jargon and confusing terms, lapses in logic, and various other deficiencies. Getting multiple reviews only increases the benefits.

Describe the investigator's prior work.

Although many funders are interested in novel approaches to problems, they also want to be assured that the researcher can do what is promised in the proposal. Toward this end, documenting prior research productivity, related prior studies, and pilot data that the investigator already has can improve the odds of funding. If the applicant's record is relatively modest, it can be helpful to collaborate with a colleague with more research productivity who can provide some of this credibility.

After the proposal: Persistence

Thomas Edison's description of genius as "1% inspiration and 99% perspiration" applies to seeking MER funding as well. Getting funded on the first submission is extremely rare. When the inevitable rejection happens, it is critically important to take the reviewers' feedback seriously—even when their comments reflect biases, misunderstandings, and flawed logic. These comments reflect how well the proposal communicated the investigator's argument and are invaluable for revising the proposal for resubmission. Anyone pursuing MER funding must be prepared to submit and resubmit, perhaps multiple times.

Concluding Remarks

In summary, finding the needle of MER funding requires considerable effort and time. The haystacks are scattered about the fields, and there are many others searching for the same needles. Finding the needle is facilitated by knowing what it looks like, searching systematically, and using all the tools and strategies of grantsmanship available, but most of all by persistence. The difficulty of the search is compensated for by the benefits that accrue from finding that needle—it can change one's career.

Funding/Support: None reported.

Other disclosures: None reported.

Ethical approval: Reported as not applicable.

References

1 Wartman SA. Research in medical education: The challenge for the next decade. Acad Med. 1994;69:608–614.
2 Reed DA, Cook DA, Beckman TJ, Levine RB, Kern DE, Wright SM. Association between funding and quality of published medical education research. JAMA. 2007;298:1002–1009.
3 Reed DA, Kern DE, Levine RB, Wright SM. Costs and funding for published medical education research. JAMA. 2005;294:1052–1057.
4 Dauphinee WD, Wood-Dauphinee S. The need for evidence in medical education: The development of best evidence medical education as an opportunity to inform, guide, and sustain medical education research. Acad Med. 2004;79:925–930.
5 Chen FM, Bauchner H, Burstin H. A call for outcomes research in medical education. Acad Med. 2004;79:955–960.
6 Whitcomb ME. Research in medical education: What do we know about the link between what doctors are taught and what they do? Acad Med. 2002;77:1067–1068.
7 Gruppen LD. Is medical education research "hard" or "soft" research? Adv Health Sci Educ Theory Pract. 2008;13:1–2.
8 Norman G. RCT = results confounded and trivial: The perils of grand educational experiments. Med Educ. 2003;37:582–584.
9 Tekian A, Harris I. Preparing health professions education leaders worldwide: A description of masters-level programs. Med Teach. 2012;34:52–58.
10 Tekian A. Doctoral programs in health professions education. Med Teach. 2014;36:73–81.
11 Liason Committee on Medical Education. LCME accreditation standards. 2015. http://www.lcme.org/publications.htm#standards-section. Accessed September 3, 2015.
12 Commonwealth Fund Task Force on Academic Health Centers. Training tomorrow's doctors: The medical education mission of academic health centers. 2002. http://www.commonwealthfund.org/~/media/Files/Publications/Fund%20Report/2002/Apr/Training%20Tomorrows%20Doctors%20%20The%20Medical%20Education%20Mission%20of%20Academic%20Health%20Centers/ahc_trainingdoctors_516%20pdf.pdf. Accessed September 3, 2015.
13 Labaree DF. Public goods, private goods: The American struggle over educational goals. Am Educ Res J. 1997;34:39–81.
14 Accreditation Council for Graduate Medical Education. ACGME outcome project. 2000. acgme.org. Accessed April 2, 2015.
15 Stemmler Fund. http://www.nbme.org/research/stemmler.html. Accessed September 3, 2015.
16 Spector Y. Information analyst, National Board of Medical Examiners. Personal communication with Larry D. Gruppen. March 26, 2015.
17 National Institutes of Health. NIH Research Portfolio Online Reporting Tools. Grants: Applications, awards. success rates, and total funding, by institute/center, mechanism, activity code, and funding source. 2015. http://report.nih.gov/success_rates/. Accessed September 3, 2015.
18 National Institutes of Health. http://www.nih.gov. Accessed September 3, 2015.
19 Agency for Healthcare Research and Quality. http://www.ahrq.gov. Accessed September 3, 2015.
20 Association for Medical Education in Europe. http://www.amee.org/awards-prizes/research-grant-award-programme. Accessed September 3, 2015.
21 Association of American Medical Colleges. Group on Educational Affairs. https://www.aamc.org/members/gea/. Accessed September 3, 2015.
22 American Medical Association. Accelerating Change in Medical Education. http://www.ama-assn.org/sub/accelerating-change/index.shtml. Accessed September 3, 2015.
23 Albert M. Understanding the debate on medical education research: A sociological perspective. Acad Med. 2004;79:948–954.
24 Gruppen LD, Yoder E, Frye A, Perkowski LC, Mavis B. Supporting medical education research quality: The Association of American Medical Colleges' Medical Education Research Certificate program. Acad Med. 2011;86:122–126.