

Building Capacity for Education Scholarship Among Clinical Educators in the Health Professions: A Best Evidence Medical Education Systematic Review of the Scope and Impact of Interventions

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Background

The launch of the Best Evidence Medical Education Guides in 1999 reflected a growing desire among health professions educators for an educational practice founded on evidence rather than dogma, rhetoric, or fashion. A key element of this endeavor is the generation of evidence by health professions educators; however, few of them encounter the training required to generate evidence that meets the criteria of scholarship, particularly as Glassick, Huber, and Maeroff (1997) operationalized the term, and therefore in keeping with the notion of *best evidence*. In response, the field is devoting an increasing amount and type of resources to endow its members with skills for education scholarship. The form and the impact of these efforts have not been surveyed, though such a synthesis could provide useful guidelines for practice. That is the purpose of this study. Our objectives are to i) identify reports of interventions to build capacity for education scholarship of discovery and research among health science educators, ii) create a typology of these efforts, which categorizes them by educational objectives and learning activities; and iii) examine the evidence on their respective impact. We will position the review in a conceptual framework, synthesize representative studies, and outline our methodology. We begin by clarifying three terms that frame our study: *education scholarship*, *clinical educator*, and *research capacity building*.

Education scholarship: The first Best Evidence Medical Education Guide presents a discussion of what counts as evidence, and it lists several things including professional experience, judgment, and educational principles (Harding, Grant, Buckley, & Hart, 1999). Atop the list exemplifying best evidence, are several types of

research, and the term education research is employed repeatedly throughout the rest of the guide to identify the grounds for an evidence-based education practice. The authors of the subsequent 18 BEME guides cemented this understanding of evidence through their inclusion and exclusion decisions. Therefore, education research, in its various forms, is the activity that concerns us in this review, and our question concerns the manner in which health professions educators are being prepared to conduct education research.

The current discourse on scholarship took form in Boyer's (1990) seminal work. Briefly, Boyer argued that the quality of higher education is jeopardized by a system that rewards academics unambiguously for their research, and ambiguously for their teaching, continuously pulling the astute academic away from the latter. To correct this, he recommended conceptualizing much of what academics do in their professional roles as forms of scholarship, provided that it was conducted appropriately (See Glassick et al. for the criteria of "appropriate").

Boyer identified four forms of scholarship—the scholarships of teaching, integration, application, and discovery. The last of these he noted was "what is meant when academics speak of research." Therefore, in keeping with Boyer's influential work, and identifying the domain that concerns us, the proper term for the focus of our study is the scholarship of discovery in health professions education. Henceforth, we will index this term with the more economical *education scholarship*.

Clinical educators: A term is also required to mark the special population that concerns us. An appropriate term will foreground the distinguishing characteristic

of this group, which is their three intersecting roles. The first role is academic, and it is this status that provides the impetus and the resources to conduct research.

Promotion is, to varying extents, attached to research productivity, and resources such as time and training are provided by the academic's organization. The second role is clinician, which is significant, because it designates someone who's training has specialized them for responsibilities other than education research, and because it designates someone who has competing professional responsibilities. And third because it designates them as personally immersed in the context and setting to which health professions education research is applied. In the literature that concern us, authors use terms such *physician educator, pharmacist educator, and nurse educator*. Referring to the members of this group collectively, we will use the term *clinical educator*.

Research capacity building: There two ways in which existing interventions have not been synthesized in this area. First, conventional reviews have not been undertaken, and second, there has been little interest in positioning interventions in broader literatures. Classifying these efforts connects designers and researchers to data, models, learning theories, and contexts for interpreting the outcome of their interventions. Two ways to frame the efforts to prepare clinical educators for education research are *faculty development* and *research capacity building*. Here, we argue briefly that the more appropriate of the two is the broader framework of research capacity building.

Faculty development, as explained in BEME Guide no. 8 (Steinert, Mann, Centeno, Dolmans, & Spencer et al., 2006), is an organized effort to help faculty

members become proficient in each of their demanding professional roles.

Researcher is central among these roles, so the topic of our review--equipping clinical educators for educational research--is squarely in the scope of faculty developers.

However, enhancing clinical educators' capability to produce sophisticated educational research involves segments of the university beyond faculty, educational objectives beyond enhanced research skills, and interventions beyond training. An illustration of this point is provided in a study by Goldzmid, Zibrowski and Watling (2008). They showed that training in education research techniques did not differentiate physicians who were prolific educational researchers, whereas the provision of protected time for research did. Thus it is not only the development of individual faculty members, their research skills, and their productivity that we will consider in this review.

Trostle (1992) offered the following germinal definition of *research capacity building*: "a process of individual and institutional development which leads to higher levels of skill and greater ability to perform useful research" (p. 2). This definition not only maintains *faculty development* as an important aspect of research-capacity building (RCB) but also expands the definition to other processes and groups that are also essential to the undertaking. Two additional qualities of RCB make it an attractive way to conceptualize the current review. First, the underlying goal of RCB efforts, across contexts, is to advance evidence-based practice. Second, these efforts admit many forms of research, but favor research on

practice by practitioners. Both of these qualities are consistent with the underlying ends and means of education research by health sciences educators.

Connecting our topic to the literature on RCB reveals a provisional typology of interventions, outcomes, and impacts with which we can classify the reports that are relevant to our synthesis. Below, we sketch the boundaries of that typology as it is portrayed in some representative studies.

Interventions: Skills training is an intervention common to most RCB efforts, and its implementations span the spectrum of approaches to adult learning. Equally common is the provision of modest financial resources in the form of bursaries, infrastructure support (e.g., data analysis software, personal computers, research assistant salaries), and small seeding grants. Some institutions commit to research centers employing research facilitators, project managers, and experienced researchers; thus offering supervision, mentoring, and opportunities for networking. Equally common is the provision of protected time or, more generously, fellowships. Another important organizational intervention is the explicit inclusion of education research activity in clinical educators' job descriptions. This list of interventions is partial, but it includes those that appear most frequently in the RCB literature (Cooke, 2005; Jameson & Vermeersch, 2012; Libereto, Brimblecombe, Ritchie, Ferguson, & Coveney, 2011).

Objectives of the interventions: The objectives of these interventions include imparting foundational research skills to clinical-educators (skills such as reviewing literature, designing studies, collecting and interpreting data, disseminating results, and managing projects) (Holden, Pager, Golenko, & Ware, 2012), increasing

research productivity (Magesa, Mwape, & Mboera, 2012), fostering a culture of research (Holden, Pager, Golenko, & Ware, 2011), removing barriers to research (Moore, Krozier, & Kite, 2012), and creating networks of researchers (Louise, 2011).

Outcomes of the interventions: Much of the writing in this domain involves advocating, conceptualizing, or describing efforts to build capacity for research among health care providers. However, there are evaluations of RCB efforts. A common metric for gauging the impact of these interventions is research productivity using traditional measures such as per capita peer-reviewed articles, presentations, and grants; impact factors for sources of dissemination; and size of research networks. Some authors argue that it is unrealistic to expect novice researchers to develop visibly on such metrics, especially during the abbreviated observational time frames of evaluations. Therefore, they gauge the impact of RCB efforts by tallying number of people trained or research projects completed, the impact on clinical educators' careers or their attitudes toward research, and, importantly, changes in the attitudes of others to clinical educators' research (Gadsby, 2011; Kira, Glover, Bullen, Viehbeck, 2011). Of this body of studies, the greatest number collect self-report data of participant satisfaction (e.g. Rosser, Goodwin, & Sequin, 2010), though some investigators have employed control groups and objective tests of knowledge, skills, and attitudes (Corchon, Portillo, Watson, & Saracibar, 2011; Holden et al., 2012).

Since at least the early 1970s, clinical educators have conducted research that serves as the foundation for an evidence-based practice. Those in the dual role of clinical-educator have realized that their educational practice, like their clinical

practice, should also be evidence-based, and they have been conducting investigations that guide their decision-making. Fortunately, individuals, teams, and institutions have recognized the need to support this complicated endeavor, and they have been experimenting with various interventions. In this study, we will review and synthesize the results of these interventions.

Scoping Search

In order to gauge the scope of the available literature, we conducted a pilot scoping search. We initially identified over 5000 titles, of which there is a range of 30-100 relevant articles depending on the sensitivity and specificity of inclusion criteria used. However, despite this large body of literature, we were unable to find a synthesis of the impact of these various interventions in relation to research capacity building. Several studies described interventions including Offices of Education, Teaching Scholars Programs, Mentorship, Peer Writing Groups, Research Forums, Small Grants and Formal Instruction. These papers describe outcomes that include knowledge acquisition, research participation, publications, grants, self-assessments, collaborations and conference presentations (Albanese, Horowitz, Moss, and Farrell, 1998; Beckman, Lee, & Ficalora, 2008; Goldszmidt, Zibrowski, & Watling, 2009; Gruppen, 2008; 2004; Frohna, Hamstra, Mullan, & Gruppen, 2006; Steinert, McLeod, Liben, & Snell, 2008).

Objective

The research question for this study is: what is the scope and impact of interventions that are meant to build capacity for education scholarship of discovery and research among clinical educators in the health professions. By *impact* we mean the effect or the influence that interventions have on their intended stakeholders. We imagine this will overlap with Guskey's (2002) familiar typology of outcomes of professional development interventions (i.e., participant reaction, learning, organizational support and learning, use of new knowledge and skills, and outcomes). We will conduct a systematic review of the literature to identify reports of such interventions, document their objectives and assess their impact. The aim of this study is to synthesize this material to guide and inform those responsible for faculty development, resource allocation and future program development in research capacity building for educational research among health science educators.

Methods

Interventions: Based on Trostle's (1992) definition, a *research-capacity building* intervention will include processes of individual and institutional development that lead to higher levels of skill and ability to perform sophisticated scholarship of discovery and research, such as:

- Fellowships
- Bursaries
- Certificates of educational research

- Teaching Scholars Programs
- Offices of educational research
- Initiative to build or expand research networks
- Research facilitators
- Mentorship
- Peer writing groups
- Peer mentoring groups
- Small grants
- Research forums
- Removal of barriers to conduct educational research
- Formal instruction
- Master's programs relevant disciplines
- Infrastructure support (e.g., data analysis software, personal computers, research assistant salaries)
- Bestowal of protected time for research
- Efforts to include research activity in clinical-educators' job descriptions
- Positioning faculty in a larger education research centre

Our literature search may uncover other types of interventions with the goal of research capacity building.

Objectives of the interventions: We will develop a typology to classify the desired outcomes of the interventions, which will begin with the following provisional list:

- Skills training (reviewing literature, designing studies, collecting and interpreting data, disseminating results, and managing projects)
- Fostering a culture of research
- Removal of barriers to research
- Creating networks of researchers

Outcomes: Our outcome measures will be changes in the capacity of an individual or organization to conduct educational research or skills or processes that contribute to this capacity. This will include:

Changes in Products of Scholarship:

- Research productivity
- Per capita or frequency of
 - Peer-reviewed articles
 - Conference presentations
 - Number of research projects completed
 - Grants
- Impact factors for sources of dissemination

Change in behaviour around Scholarship:

- Collaborations
- Research Participation
- Size of research networks

Change in knowledge (e.g. knowledge acquisition scores)

Change in attitudes/perceptions

- Confidence self ratings
- Comfort self ratings
- Changes in the attitudes of others to clinical educators' research
- Impact on clinical educators' attitudes toward research

Learner reaction/satisfaction

Other relevant outcomes

- Number of people trained
- Impact on clinical educators' careers

Inclusion and exclusion criteria:

	Inclusion Criteria	Exclusion Criteria
Population	Physicians Nurses Pharmacists Dentists Veterinarians Dieticians Clinical Psychologists Other Allied Health Professionals	Non-Health Professionals
Intervention	Fellowships Bursaries Certificates of educational research Teaching Scholars Programs Offices of educational research Initiative to build or expand research networks Research facilitators Mentorship Peer writing groups Small grants Research forums Removal of barriers to conduct educational research	

	<p>Formal instruction</p> <p>Master's programs relevant disciplines</p> <p>Infrastructure support (e.g., data analysis software, personal computers, research assistant salaries)</p> <p>Bestowal of protected time</p> <p>Efforts to include research activity in Clinical-educators' job descriptions</p>	
Outcomes	<p>Changes in Products of Scholarship:</p> <ul style="list-style-type: none"> Grants Publications Conference Presentation <p>Change in behaviour around Scholarship:</p> <ul style="list-style-type: none"> Collaborations Research Participation <p>Change in knowledge (e.g. knowledge acquisition scores)</p> <p>Change in attitudes/perceptions (Confidence self ratings / Comfort self ratings)</p> <p>Learner reaction/satisfaction</p> <p>Other relevant outcomes (as per text)</p>	
Research Design	<p>Studies which provide primary data for any of the outcomes listed above, including (but not limited to) the following designs:</p> <ul style="list-style-type: none"> Randomized controlled trials Non-randomized control trials Before and after studies Interrupted time series Qualitative or mixed method studies 	<p>Studies that do not report an outcome including:</p> <ul style="list-style-type: none"> Needs assessments Prevalence studies Opinion Papers, commentaries, letters, editorials
Language	English language (Morrison A et al., 2009)	Articles not available in English

Search Sources and Strategies:

We aim to include any study that provides primary data for any of the outcomes listed above.

The search strategy will use a combination of subject headings and free-text keyword searching. Each database search strategy will be adapted to match the appropriate subject headings used by that database (if applicable). In order to not miss relevant studies, search strategies will be modified as necessary to reflect content differences in health, education, and interdisciplinary databases.

The following health databases will be included:

- Medline (1946 – present)
- EMBASE (1980 – present)
- CINAHL
- PSYCinfo
- Cochrane Library

The following education/interdisciplinary databases will be included:

- ERIC
- Scopus

An example search for Ovid Medline is outlined below:

Faculty/Education	AND Research Capacity Building Interventions	AND Research or Scholarship
exp Education/ or Teaching/	capacity building.mp. or Staff Development/	Research/ Publishing/

<p>or “medical education”.mp. or “clinical education”.mp. or “teaching”.ti.</p> <p>OR</p> <p>(exp Health Personnel or exp Students, Health Professions/ or exp Faculty/ or “clinical faculty”.mp. or (faculty or researcher*).ti.)</p> <p>AND</p> <p>(education or teaching).mp. or ed.fs.</p>	<p>or exp Inservice Training/ or financial support/ or research support as topic/ or exp training support/ or Financing, Organized/ or Mentors/ or peer group/ or (writing group* or peer group* or mentor* or social network*).ti,ab. or (master* adj3 medical education).mp. or (staff development or faculty development or teaching scholar*).ti,ab. or (office* adj3 education).mp. or fellowship*.ti. or Program Evaluation/ or Program Development/</p>	<p>(research* or scholarship or scholarly).ti,ab.</p>
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Limits: English language, human, 1970 – present

In addition, we will hand screen the reference lists of all included studies and any relevant reviews. We will also conduct a separate citation search on Web of Science looking forward for studies that cite any of the included articles. We will contact authors of relevant studies to determine if they know of any unpublished, recently published, or ongoing studies relevant to the review. Further we will review grey literature in the field of health education to identify any relevant studies (e.g. recent conference proceedings for major health professions education conferences, Google Scholar etc.).

Study Selection Process

The titles and abstracts of the studies obtained following our search will be independently screened by two reviewers to exclude those that obviously do not meet the inclusion criteria or address the question under study.

The full texts of the remaining studies will be retrieved and a study inclusion form derived from the BEME coding template will be applied to them to filter for relevant studies. This will be done independently by two reviewers, and any disagreements that arise will be resolved through discussion, or with the aid of the third reviewer as required.

A copy of the intended inclusion form is appended.

Data extraction and quality assessment

The resultant eligible papers will undergo coding using a refined electronic BEME coding sheet for data extraction. The data extraction sheet will extract the following information:

- Author's objective
- Structured intervention
- Comparator
- Primary and secondary outcomes
- Study design
- Characteristics of the study group

A copy of the intended data extraction form is appended.

Quality assessment of studies will be evaluated using validated tools devised by The Cochrane Effective Practice and Organization of Care (EPOC) Group (<http://www.epoc.cochrane.org/en/handsearchers.html>) to determine the strength of study findings.

To ensure accuracy and consistency of data extraction, a sample of 20% of the articles will be randomly selected for checking by a second reviewer. Quality assessment will be performed independently by two reviewers. Any discrepancies between the two reviewers will be resolved by a third party and if there is extensive discrepancy, the data extraction and quality assessment coding processes will be re-evaluated.

Data Synthesis and Analysis

It is anticipated based on this review group's previous experience with systematic reviews in the medical education literature that the data obtained may be too heterogeneous to be combined for quantitative statistical meta-analysis. We will approach our analysis in an iterative and responsive fashion as we continue through the data extraction process and evaluate relevant studies. If there are data of sufficient homogeneity to combine (e.g., similar interventions, comparisons, outcomes, and study designs), we will follow standard methods for meta-analysis (www.cochrane-handbook.org). If quantitative synthesis is not appropriate we will conduct a qualitative synthesis of the evidence, using procedures such as those

outlined by Ogawan and Malen (1991) for synthesizing multi-vocal bodies of literature. Several of the steps of this approach to literature reviewing overlap with traditional approaches, but there are alternatives means of synthesis. Briefly, these approaches treat individual articles like cases in a case study, and they are interrogated using methods common to grounded theory. Recurrent topics are identified, new articles are compared and contrasted with existing ones, themes take shape, and provisional results are evaluated along criteria that comprise trustworthiness (Lincoln & Guba, 1984). We will develop evidence tables detailing study design and study population characteristics; interventions and comparisons; and, results and conclusions for the pre-specified outcomes

Project timeline

Activity	Timeline
Protocol submitted to BEME for review	Early May 2012
Conduct electronic database and hand searches	Late May 2012 (2 weeks)
Completion of screening titles, abstracts and relevant full text articles	June 2012 (2 weeks)
Piloting coding sheet	Mid June 2012 (2 weeks)
Coding of studies completed	July 2012 (4 weeks)
Data Analysis complete	Mid August (2 weeks)
Data Synthesis and initial draft of manuscript	August-September 2012 (6-8 weeks)

Conflict of interest

Nil.

Review team expertise

Rabia A Ahmed, MD, FRCPC: Dr. Ahmed is an Assistant Professor and consultant in infectious diseases at the University of Alberta. She is currently enrolled in this University's Teaching Scholars Program.

Ameer Farooq, BSc: Mr. Ameer Farooq is a second year medical student and summer studentship recipient. He has earned a degree with honors in Physiology and Developmental Biology.

Anna E. Oswald, BMSc, MD, MMed, FRCPC: Dr. Oswald is an Assistant Professor, consultant rheumatologist, and course-coordinator for the undergraduate musculoskeletal medicine course for preclinical medical students at the University of Alberta. She has a Masters in Medical Education degree from the University of Dundee. She is a Clinician Educator for the Royal College of Physicians and Surgeons of Canada. She has co-authored a systematic review on problem-based learning and has been the team lead for a BEME on musculoskeletal Clinical Skills, a BEME on Audience Response Systems and is in the process of completing a third BEME on Team Based Learning.

Dale Storie, MLIS, MA : Mr. Storie is Public Services Librarian at the John W. Scott Health Sciences Library, University of Alberta, and library liaison to the Faculty of Medicine and Dentistry and the School of Public Health. In addition to providing searching support for many systematic reviews produced at the University of Alberta, he is also the librarian instructor for a Public Health Sciences course on Systematic Reviews.

Lisa Hartling, MSc, PhD Assistant Professor, Department of Pediatrics

Dr. Hartling is Director of the Alberta Research Centre for Health Evidence and Director of the University of Alberta Evidence-based Practice Center. In this role she oversees approximately 20 staff in the production of systematic reviews, health technology assessments, and methodological research for evidence synthesis. She is a reviewer with The Cochrane Collaboration (Acute Respiratory Infections, Anesthesia, Injury, Wounds, Heart, and Infectious Diseases Groups). She has co-authored more than 30 systematic reviews. She has also co-authored a BEME on musculoskeletal Clinical Skills, a BEME on Audience Response Systems and is in the process of completing a third BEME on Team Based Learning.

Liam Rourke, PhD: Is an Associate Professor with the University of Alberta. He has joint appointments as the Director of Medical Education Research in the Department of Medicine and Director of Education Scholarship in the Faculty of Pharmacy and Pharmaceutical Science. In both positions his role is to support clinical educators' engagement in education research. Liam's PhD is in Educational Psychology, and his dissertation, which was supported by a Doctoral Fellowship from the Social Science and Humanities Research Council (SSHRC), was an interpretive exploration of adults working toward their Master's degrees online. The study was awarded Research Project of the Year by the Canadian Association of Distance Education. He has published several reviews of educational research including *Learning in Communities of Inquiry: A Review of the Literature* which received the Journal of Distance Education's Article of the Year Award. Liam currently holds two

SSHRC Standard Grants through which he explores socialization to scholarship in online doctoral programs in the health professions.

References

Albanese, M., Dottl S., & Nowacek, G. (2001). Offices of research in medical education: accomplishments and added value contributions. *Teaching and Learning in Medicine*, 13(4), 258-67.

Beckman, T. (2009). Experience with a medical education research group at the Mayo Clinic. *Medical Teacher*, 31(6), 518-521.

Cooke, J. (2005). A framework to evaluate research capacity building in health care. *BMC Family Practice* 2005, 6:44.

Corchon, S., Portillo, M., Watson, R., & Saracíbar, M. (2011). Nursing research capacity building in a Spanish hospital: an intervention study. *Journal of Clinical Nursing*, 20(17-18), 2479-2489.

Gadsby, E. (2011) Research capacity strengthening: donor approaches to improving and assessing its impact in low and middle-income countries. *Int J Health Plan Mgmt*, 26, 89–106.

Glassick CE, Huber MT, Maeroff GI. *Scholarship Assessed: Evaluation of the Professoriate*. San Francisco, CA: Jossey—Bass, 1997.

Goldzmidt, M., Zibrowski, E., & Watling, C. (2009). Fostering education scholarship: the mentored research group. *Medical Education*, 43(11), 1084-1085. doi: 10.1111/j.1365-2923.2009.03497.x

Frohna, A., Hamstra, S., Mullan, P., & Gruppen, L. (2006). Teaching medical education principles and methods to faculty using an active learning approach: the University of Michigan Medical Education Scholars Program. *Academic Medicine*, 81(11), 975-978.

Holden, L., Pager, S., Golenko, X., & Ware, R. (2011). Validation of the research capacity and culture tool: measuring RCC at individual, team, and organization levels. *Australian Journal of Primary Health*, 18(1), 62-67.

Holden, L., Pager, S., Golenko, X., & Ware, R. (2012). Evaluating a team-based approach to research capacity building using a matched-pairs study design. *BMC Family Practice*, 13(16), doi:10.1186/1471-2296-13-16.

Louise, J. (2011). *International collaboration in health science research: manna, myth, and model*. (Doctoral dissertation, University of Adelaide). Available online: <http://digital.library.adelaide.edu.au/dspace/handle/2440/67015>

Jamerson, P., & Vermeersch, P. (2012). The role of the nurse research facilitator in building research capacity in the clinical setting. *J Nurs Adm*, 42(1), 21-27.

Kira, A., Glover, M., Bullen, C., & Viehbeck, S. (2011). Publications as an indicator of increased tobacco control research productivity (Quality and Quantity) in New Zealand. *Nicotine and Tobacco Research*, 13(6), 474-478.

Liberato, S., Brimblecombe, J., Ritchie, J., Ferguson, M., & Coveney, J. (2011). Measuring capacity building in communities: a review of the literature. *BMC Public Health*, 11(850). doi:10.1186/1471-2458-11-850

Lincoln, Y., & Egon, G. (1985). *Naturalistic Inquiry*. Thousand Oaks, CA: Sage.

Louise, J. (2011). *International collaboration in health science research: manna, myth, and model*. (Doctoral dissertation, University of Adelaide). Available online: <http://digital.library.adelaide.edu.au/dspace/handle/2440/67015>

Magesa, S., Mwape, B., & Mboera, L. (2012). Challenges and opportunities in building health research capacity in Tanzania: a case of the National Institute for Medical Research. *Tanzanian Journal of Health*, 13(5).

Moore, J., Krozier, K., & Kite, K. (2012). An action research approach for developing research and innovation in nursing and midwifery practice: building research capacity in on NHS foundation trust. *Nurse Education Today*, 32(1), 39-45.

Morrison A., Moulton K., Clark M., Polisen J., Fiander M., Mierzwinski-Urban M. et al. (2009). *English-language restriction when conducting systematic review-based meta-analyses: Systematic review of publish studies* Canadian Agency for Drugs and Technologies in Health.

Ogawa, R. T., & Malen, B. (1991). Towards rigor in reviews of multivocal literatures: Applying the exploratory case study method. *Review of Educational Research*, 61(3), 265-286.

Rosser, W., Godwin, M., & Seguin, R. (2010). Family medicine research capacity building. Five-weekend programs in Ontario. *Can Fam Physician*, 56, e94-100.

Steinert, Y., McLeod, P., Liben, S., & Snell, L. (2008). Writing for publication in medical education: the benefits of a faculty development workshop and peer writing group. *Medical Teacher*, 30(8), e280-285.