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ORIGINAL CONTRIBUTION

Beyond the CLAIM: A comprehensive needs assessment strategy for creating an Advanced Medical Education Research Training Program (ARMED-MedEd)

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Abstract

Background: The health professions education (HPE) landscape has shifted substantively with increasing professionalization of research and scholarship. Clinician educators seeking to become competitive in this domain often pursue fellowships and master's degrees in HPE, but there are few resources for the continuing professional development (CPD) of those who seek to continue developing their scholarly practice within HPE. Acknowledging the multiple players in this landscape, the authors sought to design a new "beyond beginners" HPE research program using a novel needs assessment planning process.

Methods: The authors developed and conducted a new three-phase, five-step process that sets forth a programmatic approach to conducting a needs assessment for a CPD course in HPE research. The five steps of the CLAIM method are: Competitive analysis, Literature review with thematic analysis, Ask stakeholders, Internal review by experts, and Mapping of a curriculum. These steps are organized into three phases (Discovery, Convergence, and Synthesis).

Results: Over a 12-month period, the authors completed a comprehensive needs assessment. The CLAIM process revealed that longitudinal digital connection, diverse and in depth exposure to HPE research methods, skills around scholarly publishing, and leadership and management of research would be beneficial to our design.

Conclusions: The CLAIM method provided scaffolding to help the authors create a robust curriculum that adopts a scholarly approach for developing a HPE research course. This needs assessment methodology may be useful in other CPD contexts.

KEYWORDS

education research, faculty development, health professions education, health professions research, medical education, needs assessment, program development

INTRODUCTION

High-quality health professions education programs are essential in preparing the spectrum of learners from pipeline programs through continuing professional development (CPD) or continuing medical education courses. The field of medical education has progressed rapidly in recent years, calling for increased quality of scholarship.[1] For educators and clinicians alike, skills and competencies are dynamic. Clinical skills for trainees and those in active practice are increasingly thought of as competencies that must first be acquired and then maintained and updated.[2] Whereas for many faculty members, *clinical* competence is achieved through the rigors of training and maintained through the CPD process, *academic* competence is a separate construct altogether. It is reasonable to envision a parallel educational model for academic faculty in the field of health professions education and research. Just as a graduate of an internal medicine residency program devotes additional years of training to become a pulmonologist, so is it necessary for a future education scholar to dedicate a discreet training interval to master knowledge and practice under mentorship to achieve expertise. The emergence of master's programs,[3] fellowships,[4-6] and formal faculty development programs[7-9] in this area suggests that this skill set is increasingly important.

The specialty of emergency medicine (EM) was recognized as the 23rd medical specialty by the American Board of Medical Specialties in 1979, and over the ensuing 30 years, researchers and organizations devoted time and resources to develop research skills, funding mechanisms, mentorship, and networking in emergency care research.[10] In 2012, the *Academic Emergency Medicine* Consensus Conference assembled experts and thought leaders to create a roadmap for the advancement of education research in EM, including the development and implementation of training programs.[4-6] Despite the significant progress that has been made since the Consensus Conference,[1] a coordinated effort is needed to strengthen the foundation for the future success of Health Professions Education research.

The Society for Academic Emergency Medicine (SAEM) offers Advanced Research Methodology Evaluation and Design (ARMED), a course for aspiring basic science, clinical, and translational researchers. In 2019, a task force was convened by the organization to develop and implement a sister course, ARMED Med Ed, aimed at those seeking expertise in health professions education research.[1] Whereas researchers will seek to join a scholarly conversation,[11] education scholars must similarly evaluate both existing literature *and* previous educational innovations in order to build upon what others have done before. Glassick defined the need for adequate preparation as one of the key markers of scholarship, which includes understanding prior work in a field before seeking to build upon it.[12] In Kern's *Six Steps of Curriculum Development*,[13] it is recommended that curriculum development starts with two different types of needs assessment: (1) a general needs assessment that originates from prior literature (and is often combined with some sort of problem isolation activity); and (2) a specific, targeted needs assessment, which focuses more on your specific context and the requirements of key stakeholders that will be subject to your curriculum.

Developing new courses in the continuing professional development arena can be even more complex and challenging. Considering the demonstrated limitations of self-assessment,[14] accreditation standards for the maintenance of competence within our profession and discipline require those creating new CPD activities to engage in the assessment of both *perceived* and *unperceived* needs.[15-18] Perceived needs are often synonymous with needs that individuals are able to identify, due to self-identified gaps or personal interests for development. Unperceived needs are needs that practitioners may not have the ability to identify on their own, with many suggesting that this type of needs identification may need to be informed by multiple sources, such as competency assessments or performance feedback.[19-21] Few papers have provided CPD developers with clear guidance on mapping the needs of their end users.[18,22,23,24]

This article details the comprehensive, stepwise needs assessment process that the developers of the SAEM ARMED MedEd course conducted in order to determine the curricular needs for an advanced medical education research methodology course. While labor intensive, we deemed this process a necessary step in designing a course that aimed to advance the science of education research by providing targeted training to emerging scholars. This article outlines our needs assessment process, which incorporated preexisting programs, literature, current stakeholder perceptions, expert consultation, and

METHODS

Based on Kern's model of curriculum development,[13] it is essential that those designing courses engage in a thorough needs assessment. In our approach, we specifically drilled down upon the first two steps: the general needs assessment and the specific needs assessment. There are few guiding papers on how to effectively conduct needs assessments in the CPD space. Therefore, we developed the following 5-step process: 1. **C**ompetitive analysis, 2. **L**iterature review with thematic analysis, 3. **A**sk stakeholders, 4. **I**nternal review by experts, and 5. **M**apping of a curriculum (CLAIM). These steps were conducted in three phases (Discovery—which contains steps 1 & 2; Convergence—which contains steps 3 & 4; and Synthesis—which includes the final step). The paired steps (1 & 2, 3 & 4) are conducted in parallel within each phase (Figure 1).

Phase 1: Discovery

Step 1—Competitive analysis

A competitive analysis is a strategy to identify and assess existing offerings in the space. We created a list of cross-disciplinary faculty development courses that were available nationally as well as those offered by our specialty societies that were known to the investigatory team. We sought input from other faculty development experts within our networks (e.g., vice chairs of education,[25] heads of faculty development units) to identify additional programs we may have missed. For each program, we reviewed the website and reached out to its leadership team to determine the structure, format, and topics. We collected data on specific topics covered, delivery model (e.g., in-person, longitudinal online), and novel approaches for each program.

Step 2—Literature review with thematic analysis

Concurrently, we conducted a structured literature search of Google Scholar and PubMed from inception to July 30, 2019 for faculty development programs in medical education. Search terms included: medical education AND research, medical education AND scholarship. We also utilized several social media calls via Twitter to crowd-source and identify additional articles, in line with new practices in the literature for triangulating literature in a domain.[26-32] Finally, we consulted numerous medical education experts within our specialty to identify any papers we may have missed.

Peer-reviewed articles were included if they described or evaluated formal faculty development programs in medical education. In teams of two, we reviewed each paper and identified key topics and structures utilized in each program. Two people then performed thematic analysis to identify trends in programs, using a coding structure to generate a list of themes based on the provided articles.

Phase 2: Convergence

Step 3—Ask stakeholders

Based upon the data obtained from steps one and two, we created a survey that aimed to assess stakeholders' ratings of

FIGURE 1 Depicts the five steps within three phases of the CLAIM curriculum needs process: Phase 1 is Discovery and contains two steps (1. Competitive analysis, 2. Literature review with thematic analysis). Phase 2 is Convergence and contains two steps (3. Ask stakeholders, 4. Internal review by experts). Phase 3 is Synthesis and contains one final step (5. Mapping of a curriculum)
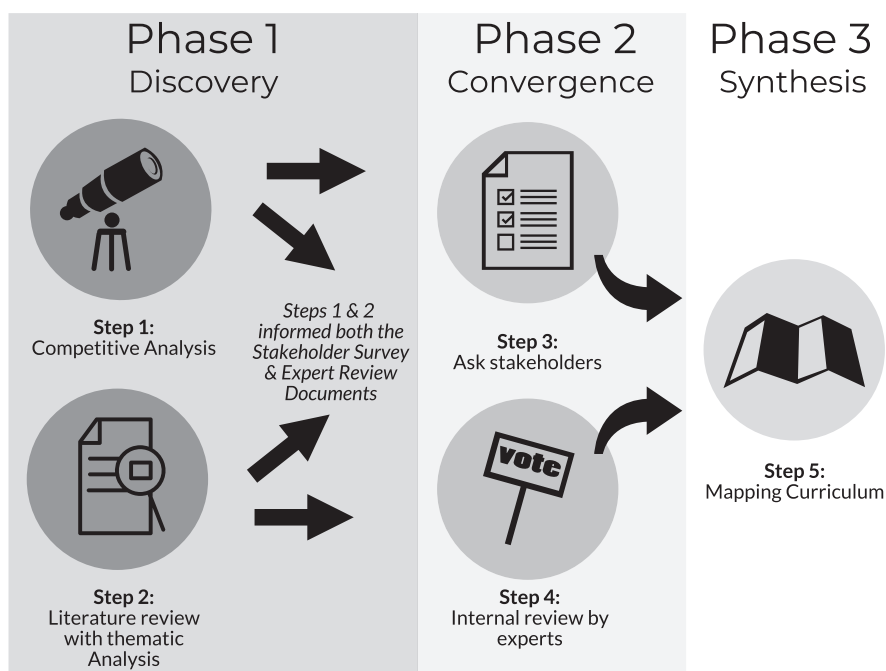
medical education topics, research and scholarship skills, and teaching methods. See Supplemental Digital Content (Supporting Information) for a copy of our survey. The survey also asked participants to provide their current academic rank and prior medical education experience. We aimed to use this as one part of a broader programmatic needs assessment, and therefore sought to recruit roughly 50 scholars in our potential stakeholder group to comment upon priorities. This was approximated based on our general impression of the number of scholars who may be of interest in this "beyond beginner" course in medical education research and scholarship, since our society's education journal (AEM Education and Training) has a reviewer list of 263 people. We estimated that a rough response rate of 20% of these reviewers (53 respondents) would represent adequate sampling of our target population since many of the reviewers are later in their career and/or part of our present course development team.

Survey items were developed based on content identified from the competitive analysis, literature, and expert review to optimize content validity. The study team reviewed the survey together to maximize response process validity, and the survey was piloted on members of the SAEM ARMED MedEd task force and revised for clarity and brevity. Differing stakeholder groups may have unique needs, so we believed it was important to include multiple stakeholders.[22,33,34] The survey was distributed to potential stakeholders on February 11, 2020 to March 13, 2020 via our national society's member listserv and openly on their social media channels.

Additionally, we engaged with key stakeholder groups (SAEM Board of Directors) overseers of our design group in order to secure approval for the details of the course as well as funding for a planned grant award (SAEM Foundation) for program participants.

Step 4—Internal review by experts

Concurrently with step 3, we created a Google Document where we mapped out the various topics from steps 1 and 2. We asked all of the experts in the ARMED MedEd task force to review all the topics from the first two steps (competitive analysis and the thematic analysis of the literature) to vote on the importance of each topic and the preferred teaching modality (e.g., live workshop experience versus asynchronous or web-based content). We then asked all the task force participants to internally review the various topics to make two types of recommendations: (1) best modality for teaching a particular content and (2) potential speakers, with the direction that we were seeking a diverse faculty.

Phase 5: Synthesis

Step 5—Mapping of a curriculum

Based upon the information from steps 1 through 4, we created a curricular grid. We discussed the sequence and basic structure of

each session, as well as identifying more potential speakers and session leaders in this phase to fill gaps in our curricular plan left empty throughout the prior steps.

Analyses

All simple descriptive statistical analyses were conducted using Microsoft Excel (Microsoft Corp.). For the thematic analysis in Step 2, we used an interpretive description[35] (considered a generic qualitative analysis method[36]) to organize themes within the data found in the literature.

RESULTS

Step 1. Competitive analysis

A list of faculty development courses was identified by the authors and other faculty development experts. These programs, including the structure, format, and topics, were reviewed and are described in Table 1.

Step 2. Literature review with thematic analysis

Our literature search revealed several important themes. First, there is an apparent need for formalized training in education scholarship.[37-46] Deliberate training in education scholarship positively impacts career development of individuals and the institutional environment through enhanced scholarly productivity, grant funding, awards, and promotions.[47] This training should include how medical education research differs from clinical or other types of research.[48] In addition to training in education theory, research designs, selection of outcomes, and data analysis, specific attention should be paid to qualitative methods, program evaluation, and curricular innovations, as these are prevalent in medical education.[4,26,49,50,51] We also identified scholarly writing, familiarity with the publication process, including peer review techniques, and venues available for publication of medical education scholarship.[11,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70]

Lack of funding was identified as a barrier to conducting high-quality research, so it is important to provide training in grant writing and identify sources of funding.[51,71,72,73] Individuals face additional barriers to performing education scholarship including lack of protected time, expertise, mentorship, and networks of collaborators.[44,51,68,69,70,71,74,75,76] Programs that enjoy success have broad stakeholder support, financial sustainability, research support and infrastructure, ongoing appraisal of participant needs, and adherence to educational best practices.[41,44,70] This evidence suggests that deliberately incorporating these findings into faculty development programs will augment results. A variety of methods were used for faculty development program delivery including online and

TABLE 1 Competitive analysis of continuing professional development opportunities for learning about medical education research and scholarship

Type	Name of program	Brief description of features
Workshops	Wilson Centre Ateliers	Intensive, multi-day workshops, tailored to experience level, on education topics including research methods and instructional delivery.
	Australia and New Zealand Clinician Educator Network	Single day, interprofessional conference for medical educators in acute care specialties based on a collaborative framework to promote communities of practice.
Certificate courses	American College of Emergency Physicians (ACEP) Teaching Fellowship	1 year faculty development fellowship to develop effective medical educators. The program includes 2 weeks of intensive in-person instruction combined with asynchronous work guided by a mentor.
	Harvard Macy Educators Course	1 year faculty development course consisting of 2 weeks of intensive in-person instruction focused on the science of learning, teaching skills, curriculum design, and leadership in education.
	Medical Education Research Certificate (MERC) Scholars Program	1–2 year faculty development course in education research methods that consists of six half-day didactic workshops and a mentored, group, education research project.
	Medical Education Research Certificate (MERC) Program at the Council of Residency Directors (CORD) in Emergency Medicine Scholars Program	Same as the above course; however, this course takes place adjacent to the CORD Emergency Medicine meeting.
	Society of Academic Emergency Medicine Advanced Research Methodology Evaluation and Design (ARMED) Course	9 month course, designed for junior faculty, on research methods and grant writing. The course consists of in-person and virtual monthly workshops.
Diploma program	Royal College Area of Focused Competence for Clinician Educators	Competency-based program to train effective clinician educators in key areas of education including learning theory, curriculum development, assessment.
Longitudinal programs	Academic Life in Emergency Medicine (ALiEM) Faculty Incubator	1 year faculty development program for emergency medicine educators that includes the establishment of a virtual community of practice. The program provides advanced training in medical education and scholarship through monthly workshops.
	ALiEM Social Media and Digital Scholarship Fellowship	1 year apprenticeship based program in social media and digital scholarship that includes a mentored individualized project. The program is not currently active.
	CanadiEM Digital Scholars Program	1 year apprenticeship-based program designed for residents, consisting of asynchronous didactic modules and longitudinal mentorship in digital scholarship.
	Society for Simulation in Healthcare (SSH) Virtual Scholars program	1 year program to provide training in simulation research and scholarship, consisting of in-person and virtual educational sessions and longitudinal mentorship.

TABLE 1 (Continued)

Type	Name of program	Brief description of features
Master's programs related to health professions education	University of Illinois at Chicago (UIC) Masters in Health Professions Education (MHPE)	Executive style, master's level program in health professions education with flexible format options to include onsite and virtual settings. Courses include assessment, teaching & learning, curriculum design & program evaluation, and research methods.
	Johns Hopkins Master of Education in the Health Professions	Online Masters of Education program that typically requires 2–5 years to complete. The program offers specialization in leadership and research.
	University of California at Los Angeles (UCLA) Masters of Arts in Education	1 year traditional Masters of Arts in Education program that allows for dedicated focus in social research methods.
	Maastricht University MHPE	2 year, part-time Master of Health Professions Education program to prepare students for a career in health professions education and research.
	University of Michigan MHPE	Competency-based, modularized Masters of Health Professions Education designed to provide training in theories of teaching and learning, teaching practice, assessment and evaluation, research and scholarship, and leadership.

in-person activities utilizing various models and frameworks.[77-79] Successful programs are able to adapt to learner needs and are flexible in delivery modalities. A summary of the literature results explaining our identification method and the main outcomes is available in Appendix 1.

Step 3. Ask stakeholders

We were able to obtain 71 responses to our stakeholder consultation survey, which was above our intended target ($n = 53$). A survey to assess stakeholders' perceived needs for medical education topics and skills was distributed to the SAEM listserv and broadly shared on social media. Our stakeholders identified perceived needs for skill and topic development. The most frequently indicated topics were mixed methods study design, qualitative methods, and assessment and program evaluation methods (Table 2). The most valuable skills to support research and scholarship success were how to obtain funding for medical education, strategies for publishing in medical education, selecting publication venues, and how to proceed with little to no funding for medical education scholarship. Stakeholders identified creating buy-in with colleagues and bosses, running a medical education research lab, being a good mentor, and leading the research team as the most valuable interprofessional and collaborative skills.

Step 4. Internal review by experts

The results of our internal expert review of session topics and preferred teaching modalities can be found in Table 3. Topics span the breadth of study design and research methods common to medical education scholarship, as well as strategies for obtaining research

funding, publishing in academic journals, and disseminating education content via social/digital media.

Step 5. Mapping of a curriculum

Based on the results of our stepwise needs assessment, we established a final curriculum map for the course (Appendix 2). The map is organized by content area and describes the intended format and specific learning objectives for each session.

DISCUSSION

Our CLAIM process allowed us to complete a rigorous, programmatic needs assessment, which informed our ultimate CPD program design. The CLAIM process revealed that longitudinal digital connection, diverse and in-depth exposure to HPE research methods, skills around scholarly publishing, and leadership and management of research would be beneficial to our program design. This method may be useful to others in CPD planning of other events.

Despite the widespread acknowledgement of the importance of needs assessments in curriculum development, there are few published descriptions of needs assessments for faculty development efforts. In this paper, we have described a rigorous five-step approach to needs assessment for a national subspecialty advanced research methods course which incorporates CLAIM. This course was imagined, supported, and funded by a national specialty association and arose from the society board's 2018 strategic planning process. The vision was novel and aspirational—to create a specialty-wide CPD program that provides advanced training to EM education researchers with an overarching goal of advancing the science of EM education research. With reverence for the unique opportunity and

TABLE 2 Stakeholder needs assessment results

Stakeholder-identified needs	Percentage % (very and somewhat useful responses/total respondents)
Useful topics for education scholars	
Mixed methods design	84% (59/70)
Assessment/performance studies	80% (57/71)
Qualitative methods	80% (56/70)
Program evaluation methods	73% (52/71)
Reviews and knowledge synthesis (scoping, systematic, metaanalysis, etc.)	69% (49/71)
Survey methods	66% (47/71)
Innovation scholarship	66% (47/71)
Observational design	58% (41/71)
Experimental design	54% (38/71)
Differentiating medical education research/scholarship from clinical research	42% (30/71)
Useful skills required for successful research and scholarship	
Funding for medical education scholarship (e.g., funding sources)	81% (57/70)
Strategies for publishing in medical education journals (i.e., understanding editorial processes etc.)	74% (52/70)
Selecting possible publication venues	69% (48/70)
How to proceed with little-to-no funding in medical education scholarship	69% (48/70)
How to write for medical education journals (e.g., the mechanics of writing a manuscript)	66% (47/71)
Digital and innovative knowledge translation (podcasts, blogs, etc.)	61% (43/70)
Developing a niche in medical education	51% (36/70)
Time management for the successful education scholar	47% (33/70)
Traditional knowledge translation (abstracts, presentations, etc.)	43% (30/69)
Career planning	35% (24/69)
Interpersonal skills and collaboration topics/skills	
How to create buy-in with colleagues/bosses	83% (59/71)
How to run a medical education research lab (human resources, managing personnel, funding, etc.)	77% (55/71)
How to be a good mentor	70% (50/71)
How to lead a research team	70% (50/71)
Group mentorship (i.e., understanding the mechanics of how to conduct a group for mentorship purposes)	61% (43/71)
How to form a research team/network	59% (42/71)
How to connect with other to create research networks	52% (37/71)
How to cultivate a good mentor in education scholarship	48% (34/71)
How to become a community of practice	44% (31/71)
How to be a good research team member	38% (27/71)

potential impact of this program, we sought to develop and apply a needs assessment approach that would optimize the future program's ability to improve the participants' scholarship and meaningfully advance our field. This approach may be built upon and applied to other faculty development efforts.

Although there are many commentaries and reflections on needs assessments,[19,80,81] there are few worked examples of a programmatic approach to conducting a needs assessment for developing a CPD course. Many reported needs assessments tend to focus on data collection from single sources such as surveys, although these have become increasingly complex over time.[16,18,82] Recently, novel approaches have been applied to conduct more holistic needs assessments for local groups by triangulating needs via multiple sources of information and using multiple methodologies, including design thinking.[22,34] However, for multicenter or national-level CPD courses, it is unclear how one might proceed in determining the needs of multiple potential stakeholders across many institutions.

Our CLAIM approach provides a stepwise procedure that utilizes a programmatic approach to conducting a needs assessment that integrates multiple sources of information into one strategic approach

TABLE 3 Proposed curriculum map for ARMED-MedEd

Session topic	Format	Learning objectives
Experimental/quasi-experimental designs (RCTs, cohort studies, etc.)	3-h workshop	• Describe 6 types of experimental designs that are effective in MedEd (RCT, cohort studies, case-control studies, pre-/post-studies, generalizability studies, rating studies [ICC]) • List the pros/cons of the 6 experimental designs in MedEd • Select and defend the choice of a specific study design.
Observational study designs	2-h workshop	• Describe four types of observational designs that are effective in MedEd (Database studies [especially of assessment data], Open data review [doing work on publicly available data], opportunistic before/after studies [COVID19 responses to EMConf], Twitter analysis) • List the pros/cons of the 4 experimental designs in MedEd • Select and defend the choice of a specific study design.
Qualitative research methods	3-h workshop	• Discuss the epistemic differences between qualitative and quantitative approaches (constructivist vs. post-positivist) • Describe at least 4 approaches to qualitative methods (Grounded Theory, Phenomenology, Ethnography, Generic Qualitative Methods) • Explain key elements of coding, analysis, and markers of rigor
Survey research methods	2-h workshop	• Describe key facets of survey development and design • Describe when to use a survey. • Troubleshoot common problems with surveys • List pitfalls that they can avoid when designing surveys.
Assessment/performance studies	2-h workshop	• Describe two key assessment validity paradigms (Kane & Messick) and how to operationalize these in studies. • Compare and contrast Kane & Messick's frameworks. • List key areas of recent innovation around learning analytics (predictive algorithms) and qualitative comment content review (NLP)
Program evaluation methods	2-h workshop	• Understand the core theories and related approaches that govern rigorous program evaluation • Describe list key program evaluation frameworks, including: Kirkpatrick, Realist, Logic Model, outcomes-based program evaluation, qualitative (including participant-driven) • Identify differences between research & program evaluation • Discuss evaluation theory • Match program evaluation methods to different scenarios.
Innovation scholarship	1-h didactic	• Describe innovation scholarship and Pasteur's quadrant • Articulate the difference between innovation work and program evaluation • Identify at least three journals that are welcoming of innovation work
How to write for medical education journals (including responding to reviewers)	2-h panel discussion	• Describe key steps to successfully publishing a manuscript in a MedEd journal. • Discuss their difficulties with the peer review process. • Participate in a peer review process with a colleague. • Respond to peer reviews in an effective manner.
Strategies for publishing in medical education journals	1-h panel discussion	• Identify key insights from journal editors about pitfalls and pearls for publishing in Health Professions Education
Selecting possible publication venues for your work	Podcast panel discussion	• Discuss the Journal Abstract/Name Estimator (JANE) • Articulate how to "profile" a journal • Discuss Predatory Journals • Review the pros/cons of Open Access
Funding for medical education	Webinar panel—recorded on YouTube Live	• Grants and how to approach them—MedEd vs. Health Services • Profiling grants–what should you look for • Understanding review processes and the variability between granting agencies

TABLE 3 (Continued)

Session topic	Format	Learning objectives
How to proceed with little-to-no-funding in medical education	Podcast panel discussion	• List 3 strategies to proceed with health profession education research without major funding (e.g. crowd-sourcing, self-funding, rostering volunteers).
Digital & innovative knowledge translation	Webinar panel discussion	• List three key formats that are increasingly encouraged by journal editors and granting agencies to disseminate your research after publication (infographics, podcasts, blogs) • Construct acceptable posts (tweets, Facebook post, LinkedIn Post) for social media • Construct an infographic for their most recent study
Differentiating MedEd research/scholarship from clinical research	Webinar panel discussion	• Describe overlaps and differentiators between clinical research and health professions education research • Outline pitfalls for which early career researchers in health professions education research often succumb
Reviews and knowledge syntheses	Webinar panel discussion	• Overview of types of reviews and knowledge syntheses that are available • Match type of review or synthesis to the type of study question

for a national curricular development in the CPD arena. While there are some novel strategies such as multiphase online surveys[16,17,18,82] that attempt to discern wider needs of a group, we propose and describe a five-step proposition that increases the rigor of prior approaches, allowing curricular designers to build upon prior work (via the competitive analysis and literature review), engage stakeholders (by asking them in the form of surveys or other end-user consultation techniques), then filter these complex findings via internal expert review, and finally map these needs into a curriculum.

Future research should assess the effectiveness of this course and compare it with other faculty development courses. Additionally, studies should evaluate the efficiency and effectiveness of this comprehensive needs assessment model with other models. Finally, researchers should determine which components of the needs assessment are of highest utility and how best to engage end-users in this process.

Next steps

This needs assessment informed the development of the curriculum for the SAEM ARMED MedEd course, which will launch in Spring 2021. The completion of our needs assessment coincides with the emergence of the COVID-19 global pandemic, which has necessitated the conversion of planned in-person course activities to virtual session.[83,84] However, these adaptations have been made with our stakeholders' needs as a foundational priority. Iterative assessment of ongoing needs in a virtual learning community will inform future curriculum revision.

Limitations

Our study has several limitations. First, since we targeted clinician educators in the field of EM it is unclear if needs may differ for those in other specialties. Additionally, the survey response rate was approximately what we had hoped (our target was 53, and we

received 71), though within our specialty there are a limited number of education scholars who would be looking for "beyond beginner" content—and therefore, we approximate that our survey reached a representative sampling of this based on the number of experienced, regular contributors to our society's education journal. Finally, while we performed a comprehensive literature search with dual assessment and expert consultation, it is possible that we may have missed a relevant study that was not identified by our search or was published after the search was conducted.

CONCLUSIONS

We present a novel approach to conducting a needs assessment procedure to design an international course for those interested in advanced health professions education research. Our CLAIM method involved five unique steps (Competitive analysis, Literature review, Ask stakeholders, Internal review by experts, and Mapping), which represents a programmatic approach to discerning the needs for diverse stakeholders while also balancing this with the wisdom of experts and acknowledging the prior work of others. We hope that our programmatic needs assessment approach may help other curriculum designers to apply more robust methods to more effectively aggregate the complex needs within the CPD space.

CONFLICT OF INTEREST
Drs. Chan and Gottlieb report teaching honoraria from the ALiEM, LLC for their work on the Faculty Incubator program. Drs. Lawson

and Santen reports that their institution has received special funding from the American Medical Association. Drs. Chan and Clarke report funding for their work from the University. Dr. Chan has received funding from the Canadian Association of Emergency Physicians, Royal College of Physicians and Surgeons of Canada, and the PSI Foundation.

AUTHOR CONTRIBUTIONS

TC and MG drafted the outline of the paper. All of the authors contributed to collecting and analyzing the data. All of the authors contributed to content development. All of the authors contributed to writing and gave final approval to the manuscript.

ETHICS

Hamilton Integrated Research Ethics Board granted exemption for this study.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

APPENDIX 1.

An annotated listing of our literature review with original source for paper

Citation	Main summary points	Identified by
Baldwin CD, Levine HG, McCormick DP. Meeting the faculty development needs of generalist physicians in academia. Acad Med 1995;70(1 Suppl):S97–103.	• Perceived needs of faculty include a more in depth understanding of their academic activities, networking and collaboration, and greater autonomy regarding their time and duties.	Google Scholar
Bandiera G, Leblanc C, Regehr G, Snell L, Frank JR, Sherbino J. Education scholarship in emergency medicine part 2: supporting and developing scholars. CJEM 2014;16(Suppl 1):S6–S12.	• Emergency medicine can make education scholarship a priority by providing training for emerging scholars and support for scholarship via mentorship, protected time, and operational resources. • Leaders should consider developing defined positions for education scholars within departments and institutions. • Education scholarship should be promoted among EM trainees to permit them to consider this academic path.	Google Scholar

Citation	Main summary points	Identified by
Bertram A, Yeh HC, Bass EB, Brancati F, Levine D, Cofrancesco J Jr. How we developed the GIM clinician-educator mentoring and scholarship program to assist faculty with promotion and scholarly work. Med Teach 2015;37(2):131–5.	• The Clinician-Educator Mentoring and Scholarship Program (CEMSP) was created to in an effort to support educators in scholarly pursuits and career advancement and demonstrated positive outcomes. • Important elements of the program include salary supported program leadership, a research coordinator, and statistical support.	Google Scholar
Bhanji F, Cheng A, Frank JR, Snell L, Sherbino J. Education scholarship in emergency medicine part 3: a "how-to" guide. CJEM 2014;16 (Suppl 1):S13–8.	• Steps for innovation and associated scholarship include: 1. Problem identification and general needs assessment, 2. Needs assessment, 3. Development of goals and objectives, 4. Development of instructional methods, 5. Implementation, 6. Evaluation and feedback, 7. Dissemination of findings	Google Scholar
Blanchard RD, Artino Jr AR, Visintainer PF. Applying clinical research skills to conduct education research: important recommendations for success. JGME 2014;6(4):619–622.	• Education research is complex and while there are similarities between education research and clinical research, there are also important differences. • Educational, behavioral, cognitive, and sociocultural theories play an important role in education research.	Tony Artino (@mededdoc) via Twitter
Brown GM, Lang E, Patel K, McRae A, Chung B, Yoon P, Dong S, Blouin D, Sherbino J, Hicks C, Bandiera G, Meyers C. A National faculty development needs assessment in emergency medicine. CJEM 2016;18(3):161–82.	• Faculty participate in bedside teaching, small group instruction, large group instruction, rounds presentations, supervision of medical trainees, educational leadership activities, curriculum or simulation development, participation in journal clubs, and activities related to social accountability. • Research training is an identified faculty development need.	PubMed
Bryan B, Church HR. Twelve tips for choosing and surviving a PhD in medical education - a student perspective. Med Teach 2017;39(11):1123–1127.	• Provides strategies for success for those considering a PhD in education including what to expect, where to find resources, and how to select a question or domain of focus.	Reuben Schmidt (@____) via Twitter
Chan TM, Gottlieb M, Fant AL, Messman A, Robinson DW, Cooney RR, Papanagnou D, Yarris LM. Academic primer series: five key papers fostering educational scholarship in junior academic faculty. West J Emerg Med 2016;17(5):519–26.	• Steps to develop scholarly projects and high quality research in education include problem identification, development and refinement of a research question, incorporating a conceptual framework, selection of study design and outcomes, and dissemination of findings • Junior scholars can increase their productivity by honing their project management skills.	Google Scholar
Chew LD, Watanabe JM, Buchwald D, Lessler DS. Junior faculty's perspectives on mentoring. Acad Med 2003;78(6):652.	• Mentoring relationships can positively impact the careers of junior faculty. • Clinician-scientist researchers had a greater likelihood of having mentors than clinician-educators. • Clinician-educators with mentors spent a higher proportion of time in scholarly activity.	Google Scholar

Citation	Main summary points	Identified by
Coates WC, Lin M, Clarke S, Jordan J, Guth T, Santen SA, Yarris LM. Defining a core curriculum for education scholarship fellowships in emergency medicine. Acad Emerg Med 2012;19(12):1411–8.	• Common features of fellowships include pedagogy, curriculum design, assessment, program evaluation, and research methods. • Important components of a curriculum in medical education scholarship should feature research, didactics, faculty development, clinical, administration, and service.	PubMed
Coates WC, Love JN, Santen SA, Hobgood CD, Mavis BE, Maggio LA, Farrell SE. Faculty development in medical education research: a cooperative model. Acad Med 2010;85(5):829–36.	• The Medical Education Research Certificate (MERC) program was created to provide faculty development in education research through didactics and a mentored collaborative project. • The anticipated benefits of the program include development of a cadre of education researchers in emergency medicine and creation of a research community.	PubMed
Coates WC, Runde DP, Yarris LM, Rougas S, Guth TA, Santen SA, Miller J, Jordan J. Creating a cadre of fellowship-trained medical educators: a qualitative study of faculty development program leaders' perspectives and advice. Acad Med 2016;91(12):1696–1704.	• No standard post-residency training in medical education exists for education focused faculty to gain needed skills. • Strategies for successful post graduate medical education training include securing support of key strategic partners and leaders, ensuring financial flexibility, adhering to best practices in planning educational goals, objectives, and program evaluation.	Google Scholar
Cofrancesco J, Barone MA, Serwint JR, Goldstein M, Westman M, Lipsett PA. Development and implementation of a school-wide institute for excellence in education to enable educational scholarship by medical school faculty. Teach Learn Med 2018;30(1):103–111.	• A faculty development program was created to promote research, scholarship, and innovation. • Faculty needs include curriculum development, educational research skills (research design, instrument design, data analysis), grant writing, and dissemination of scholarship. • Mentorship, time, and ongoing needs assessment of participants are important for success.	PubMed
Cristancho S, Varpio L. Twelve tips for early career medical educators. Med Teach 2016;38(4):358–63.	• Strategies for success for early career educators includes making plans, knowing oneself, cultivating mentor and peer relationships, and building resilience.	Jennifer Klassen (@jennyellyk) via Twitter
Farley H, Casaletto J, Ankel F, Young KD, Hockberger R. An assessment of the faculty development needs of junior clinical faculty in emergency medicine. Acad Emerg Med 2008;15(7):664–8.	• Junior emergency medicine faculty perceived faculty development needs in bedside and didactic teaching, business and managerial skills, education research, mentorship, communication and leadership skills, scholarly writing, and physician wellness, and understanding of the faculty development process.	PubMed
Gillespie D, Dolšak N, Kochis B, et al. Research circles: supporting the scholarship of junior faculty. Innov High Educ 2005;30:149–162.	• New faculty may feel overwhelmed by job tasks and need mentors, a support system of colleagues, and communities of practice. • Research circles, composed of three to four faculty, facilitated writing and fostered community.	Google Scholar

Citation	Main summary points	Identified by
Goldszmidt MA, Zibrowski EM, Weston WW. Education scholarship: it's not just a question of 'degree.' Med Teach 2008;30(1):34–9.	• Many medical faculty perceive that they are not adequately equipped to pursue education scholarship. • Barriers to performing education scholarship include time, access to support staff, and knowledge of research methodology. • Education research support, collaboration, and ongoing professional development activities may help faculty succeed in education scholarship.	Google Scholar
Gruppen LD, Frohna AZ, Anderson RM, Lowe KD. Faculty development for educational leadership and scholarship. Acad Med 2003;78(2):137–41.	• An intensive faculty development program in education scholarship can positively impact the careers of participants and the institutional environment. • Positive outcomes of dedicated faculty development in education include increased promotions, scholarship, educational awards, and grant funding.	Google Scholar
Jordan J, Coates WC, Clarke S, Runde D, Fowlkes E, Kurth J, Yarris L. The uphill battle of performing education scholarship: barriers educators and education researchers face. West J Emerg Med 2018;19(3):619–629.	• Barriers to research publication for educators include lack of time, competing demands, lack of support, lack of funding, and challenges achieving scientifically rigorous methods and publication. • Strategies for success in education research include mentorship, formal research training, collaboration, and adherence to rigorous methodological standards.	Google Scholar
Jordan J, Jones D, Williams D, Druck J. Publishing venues for education scholarship: a needs assessment. Acad Emerg Med 2016;23(6):731–5.	• There is a perceived lack of venues for education scholarship. • Additional education supplements in journals, research methods training for educators, virtual networking site of education researchers, and mentorship may increase successful publication of education scholarship.	PubMed
Jordan J, Yarris LM, Santen SA, Guth TA, Rougas S, Runde DP, Coates WC. Creating a cadre of fellowship-trained medical educators, part II: a formal needs assessment to structure postgraduate fellowships in medical education scholarship and leadership. Acad Med 2017;92(8):1181–1188.	• There is a perceived need for training in education theory, clinical teaching, instructional delivery, and education scholarship. • Deliberately structuring education scholarship fellowships to meet these needs may help better prepare education faculty for job tasks and meet the expectations of supervisors.	PubMed
Kreber C. The scholarship of teaching and its implementation in faculty development and graduate education. 2001;2001(86):79–88.	• The scholarship of teaching should be implemented in faculty development programs. • Mentorship, reading circles, and communities of practice are valuable resources.	Google Scholar
McGaghie WC. Scholarship, publication, and career advancement in health professions education: AMEE Guide No. 43. Med Teach 2009;31(7):574–90.	• There are many types of scholarship in education including journal articles, book chapters, and curriculum descriptions. • Scholarly teams with shared goals, sustained worth ethic, and clear leadership can help increase productivity. • Strategies for successful publication include addressing important problems, utilizing rigorous investigational methods, and high quality writing.	Google Scholar

Citation	Main summary points	Identified by
Palepu A, Friedman RH, Barnett RC, Carr PL, Ash AS, Szalacha L, Moskowitz MA. Junior faculty members' mentoring relationships and their professional development in U.S. medical schools. Acad Med 1998;73(3):318–23.	• Approximately 50% of junior faculty surveyed had mentors. • Mentorship improved research skills.	Google Scholar
Paetow G, Zaver F, Gottlieb M, Chan TM, Lin M, Gisondi MA. Online mastermind groups: a non-hierarchical mentorship model for professional development. Cureus 2018;10(7):e3013.	• Online Mastermind groups was a feasible and effective mentorship model that can aid professional development in medicine.	PubMed
Perspectives on Medical Education *The Writer's Craft* series	• Junior authors may struggle with writing and manuscript construction.	Shiphra Ginsburg (@sginsburg1) via Twitter
Rush SC, Wheeler J. Enhancing junior faculty research productivity through multi institution collaboration: participants' impressions of the school psychology research collaboration conference. Can J School Psychol 2011;26(3):220–240.	• Research collaboration networks consisting of multiple career levels and multi institution are beneficial to creating and sustaining research productivity. • Knowledge of grant resources can be beneficial for junior researchers.	Google Scholar
Steinert Y, Mann K, Centeno A, Dolmans D, Spencer J, Gelula M, Prideaux D. A systematic review of faculty development initiatives designed to improve teaching effectiveness in medical education: BEME Guide No. 8. Med Teach 2006;28(6):497–526.	• The majority of included faculty development initiatives target practicing clinicians, focusing on clinical teaching improvement with secondary emphasis on feedback/evaluation, small group teaching, and lecturing skills. • The majority of activities were workshops with varied use of instructional methods and duration. • Outcomes of faculty development initiatives included reaction, knowledge acquisition, behavior, and to a lesser degree, results.	Google Scholar
Tekian A, Roberts T, Batty HP, Cook DA, Norcini J. Preparing leaders in health professions education. Med Teach 2014;36(3):269–71.	• There has been increasing participation in MHPE programs. • Reasons for pursuing a MHPE include a desire for enhanced knowledge and skills, to learn new approaches to educational programs, opportunity for networking and collaboration, and external validation of a skill set.	PubMed
Thorndyke LE, Gusic ME, George JH, Quillen DA, Milner RJ. Empowering junior faculty: Penn State's faculty development and mentoring program. Acad Med 2006;81(7):668–73.	• An empowerment model can be an effective model for faculty development programs, especially those geared towards junior faculty. • Empowering faculty assist them in succeeding in academic medicine.	Google Scholar
Varpio L, Ajjawi R, Monrouxe LV, O'Brien BC, Rees CE. Shedding the cobra effect: problematising thematic emergence, triangulation, saturation and member checking. Med Educ 2017;51(1):40–50.	• Qualitative methods are rarely taught in other spheres • Qualitative researchers in health professions education should be critical and reflexive in their use of qualitative terms and methodology.	Dan Ting (@tingdan) via Twitter
Zibrowski EM, Weston WW, Goldszmidt MA. 'I don't have time': issues of fragmentation, prioritisation and motivation for education scholarship among medical faculty. Med Educ 2008;42(9):872–8.	• Barriers to performing education scholarship include time fragmentation, difficulty prioritizing education scholarship among multiple competing demands, and lack of appreciation for education research from colleagues.	PubMed

APPENDIX 2.

Expert consensus on preferred teaching modality

Topic	Preferred teaching modality
Differentiating Med-Ed research/scholarship from clinical research	Asynchronous (e.g., podcast, webinar)
Experimental designs (RCTs, cohort studies, etc.)	Mainstage didactic lecture
Observational designs	Mainstage didactic lecture
Survey methods	Mainstage didactic lecture
Assessment/performance studies (e.g., learning analytics etc.)	Mainstage didactic lecture
Qualitative methods	Mainstage didactic lecture
Program evaluation methods	Mainstage didactic lecture
Innovation scholarship	Mainstage didactic lecture
How to write for medical education journals	Mainstage didactic lecture
Reviews and knowledge syntheses	Asynchronous (e.g., podcast, webinar)
Strategies for publishing in medical education journals	Asynchronous (e.g., podcast, webinar)
Selecting possible publication venues for your work	Asynchronous (e.g., podcast, webinar)
Funding for medical education	Asynchronous (e.g., podcast, webinar)
How to proceed with little-to-no-funding in medical education	Asynchronous (e.g., podcast, webinar)
Digital & innovative knowledge translation (podcasts, blogs, etc.)	Asynchronous (e.g., podcast, webinar)