

A Novel Specialty-Specific, Collaborative Faculty Development Opportunity in Education Research: Program Evaluation at Five Years

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Abstract

Purpose

For the busy clinician–educator, accessing opportunities that develop the skills and knowledge necessary to perform education research can be problematic. The Medical Education Research Certification at Council of Emergency Medicine Residency Directors (MERC at CORD) Scholars' Program is a potential alternative. The current study evaluates the program's outcomes after five years.

Method

The authors employed a quasi-experimental design in this study. The study population consisted of the initial five MERC at CORD cohorts (2009–2013). Development of a logic

model informed Kirkpatrick-level outcomes. Data from annual pre/post surveys, an alumni survey (2014), and tracking of national presentations/peer-reviewed publications resulting from program projects served as outcome measurements.

Results

Over the first five years, 149 physicians participated in the program; 97 have completed six MERC workshops, and 63 have authored a national presentation and 30 a peer-reviewed publication based on program projects. Of the 79 participants responding to the pre- and postsurveys from the 2011–2013 cohorts, 65 (82%) reported significant improvement in skills and knowledge

related to education research and would recommend the program. Of the 61 graduates completing the alumni survey, 58 (95%) indicated their new knowledge was instrumental beyond educational research, including promotion to new leadership positions, and 28 (47% of the 60 responding) reported initiating a subsequent multi-institutional education study. Of these, 57% (16/28) collaborated with one or more peers/mentors from their original program project.

Conclusions

Kirkpatrick-level outcomes 1, 2, 3, and perhaps 4 demonstrate that the MERC at CORD program is successful in its intended purpose.

Outstanding educational outcomes rely on rigorously designed and tested measures that are effective in diverse settings. For nearly two decades, members of the academic medicine community have been calling for improvements to the context and quality of medical education research.^{1–8} One obstacle to reaching this goal is that many clinician–educators lack the skills to conduct and the understanding of theory that underlies effective education research. Previously, we surveyed leaders in emergency medicine (EM) education

interested in research and found that these leaders did not believe they had the training necessary to translate their ideas into actionable research.⁹ This group identified additional obstacles including lack of time, funding, mentorship, departmental support, and a network to promote their research interests. A growing body of evidence indicates that these concerns are common in the medical education research community.^{6,10–14}

A number of avenues are available to the clinician–educator who would like to improve his or her education research knowledge and skills; these include the traditional unstructured apprenticeship, education fellowships, and advanced degrees in education (e.g., MHPE, PhD). The Council of Emergency Medicine Residency Directors (CORD) is an academic community that serves the mission of EM educators in the United States through program support and faculty development. Its mission statement includes “Fostering

educational scholarship/research.”¹⁵ In 2008, an informal online survey queried CORD members regarding their interest in participating in a longitudinal professional development opportunity designed to promote and improve knowledge and skills to perform education research.⁹ The members' positive response suggested that they felt a need for alternative professional development avenues in this domain. This informal needs assessment was the impetus for creating a faculty development program specifically designed to support EM educators' efforts to evaluate and conduct education research. We have presented the details of this program in our original process report.⁹

In 2004, the Association of American Medical Colleges (AAMC) Group on Educational Affairs (GEA) developed a series of content-based workshops that, on completion, resulted in Medical Education Research Certification (MERC). The GEA intended for this

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program to provide participants with (1) the knowledge necessary to become informed consumers of the medical education research literature, and (2) the skills to be effective collaborators in medical education research. Working collaboratively in 2009, the AAMC and CORD developed the MERC at CORD Scholars' Program, the pedagogical design of which is based on the tenets of experiential learning and social learning theories.⁹

The MERC at CORD Scholars' Program begins annually in March and consists of seven to eight sequenced MERC workshops (Table 1) offered in association with three national EM meetings: the CORD Academic Assembly in March, the Society of Academic Emergency Medicine (SAEM) in May, and the American College of Emergency Physicians (ACEP) in October. The AAMC selects an accomplished medical educator to direct each workshop. In addition, a cadre of trained EM education research specialists act as mentors, guiding the experiential learning portion of the program.^{9,16} At the initial meeting in March, participants break into groups of three to seven individuals based on a shared area of interest with the intention of developing a research project that will be completed within the ensuing one to two years. Each project group has its own mentor, with three to four mentors participating per year. Participants

generally represent a geographically diverse group, advantageous for the design of multi-institutional projects. The group process promotes collaboration, the sharing of resources, access to greater numbers of research participants, and an opportunity to learn multicenter research methods. We integrate MERC workshops and project development by having participants apply concepts learned during each session directly to each project during breakout sessions (which are built into each workshop). Between national in-person meetings, the MERC at CORD director and mentors coordinate monthly project group updates, relevant readings, and education research "pearls" that they e-mail to participants. The intent of these communiqués and other contact is to maintain project momentum, reactivate learning, promote retention, and deepen understanding of concepts.^{9,16}

The immediate goal of the MERC at CORD program is to provide an opportunity to acquire basic knowledge and skills in education research while developing a collaborative community of individuals devoted to performing educational research. Specifically, we intend for this program to remove a number of the aforementioned barriers to career development in this area. The current study evaluates the outcomes of the MERC at CORD Scholars' Program after five years of experience (2009–2013). Our objective

is to determine the degree to which the program has achieved its intended purpose. In so doing we strive to answer the call for increased rigor in the evaluation of faculty development programs.^{17–21}

Method

This study employs a quasi-experimental design. This program evaluation was guided by a logical model, which we developed through an iterative process that began in March 2009. We refined the resulting model over several years through annual analysis using the input of participants, mentors, and external consultants experienced in program evaluation. In December 2013, we completed the logic model, which reflected the consensus opinion of the key stakeholders in the program. The final logic model is available as Supplemental Digital Appendix 1 at <http://links.lww.com/ACADMED/A325>. Outcome indicators identified by the logic model are the basis for evaluating the 2009–2013 cohorts of the MERC at CORD Scholars' Program (Chart 1).²² The Georgetown institutional review board approved this program study as exempt.

Short-term outcomes

We defined short-term outcomes as those that would be measurable at the completion of the formal program (i.e., at the end of the first year) for each cohort (Chart 1). These include perceived improvement in skills and knowledge, ability to network and access mentorship, and self-reported satisfaction with the program. The MERC at CORD director and mentors developed a pre- and postprogram survey through discussions with participants. After an iterative process of optimizing content and response processes, the director and mentors came to a final consensus. The resultant 12-item survey includes a combination of open-ended questions and those ranked on a five-point Likert-type scale (see Supplemental Digital Appendix 2 at <http://links.lww.com/ACADMED/A326>). We administered surveys, which included a mechanism for gathering informed consent, to all MERC at CORD participants via SurveyMonkey approximately one month prior to starting the program and again one year later (2011–2012). In this design, preprogram questionnaires serve as the control for the postprogram survey.

Table 1
The MERC at CORD Scholars' Program: MERC Workshops Offered

Workshop title	Meeting at which the workshop occurs	Frequency with which each workshop is offered (month offered)
Formulating Research Questions and Designing Studies	CORD	Annually (March)
Searching & Evaluating the Medical Education Literature	CORD	Annually (March)
Hypothesis-Driven Research	SAEM	Annually (May)
Measuring Educational Outcomes with Reliability & Validity	SAEM	Annually (May)
Questionnaire Design and Survey Research	ACEP	Annually (October)
Introduction to Qualitative Data Collection Methods	ACEP	Annually (October)
Program Evaluation & Evaluation Research ^a	CORD	Every other year (March)
Scholarly Writing: Publishing Medical Education Research ^a	CORD	Every other year (March)

Abbreviations: MERC, Medical Education Research Certification; CORD, Council of Emergency Medicine Residency Directors; SAEM, Society of Academic Emergency Medicine; ACEP, American College of Emergency Physicians.

^aElective workshops offered every other year for interested individuals.

Chart 1

Short-Term, Intermediate, and Long-Term Outcomes Based on Logic Model Outcome Indices for the MERC at CORD Scholars' Program^a

Short-term outcomes	Intermediate outcomes	Long-term outcomes
1. Improved knowledge and confidence regarding education research	1. Experiential learning: broadening/reinforcing knowledge through the completion of an education research project	1. Development of communities of practice that support members' career development in scholarship and beyond
2. Networking with like-minded peers and mentors through an education research project	2. Initiation of subsequent education scholarship projects that include peers and/or mentors from the MERC at CORD program	2. Creation of a community that provides tiered experiential learning in education research, building upon MERC at CORD
	3. Development of a community of MERC at CORD Scholars who promote education scholarship by giving back to the program	3. Creation of a community that develops high-level, multi-institutional projects that answer important questions in education

Abbreviations: MERC indicates Medical Education Research Certification; CORD, Council of Emergency Medicine Residency Directors.

^aThe authors have defined "short-term" as ≤ 1 year, "intermediate" as 1–3 years, and "long-term" as ≥ 3 years.

In 2013, the program evaluation transitioned to a retrospective "post-then-pre" design through which participants, at the end of the program, rated their relevant skills and knowledge both prior to the program (pre) and at the program's end (post). Research indicates that a retrospective presurvey is more accurate because it provides the same frame of reference as the posttest, thereby minimizing the potential for response shift bias.²³

Another short-term outcome was the number of participants who completed six MERC workshops, thereby earning MERC Diplomat status from the AAMC. We tracked participation using sign-in sheets at each session. The MERC at CORD director and mentors designated reaching this milestone (attending six MERC workshops) as one of the immediate goals of the program (Milestone #1).

Intermediate outcomes

We defined intermediate outcomes as those that would be observed for each cohort one to three years after beginning the program (Chart 1). These outcomes relate to broadening and reinforcing the knowledge and skills related to education research learned in the workshops.

The program leaders designated Milestone #2 as the attainment of MERC at CORD Scholar status. This status is earned by becoming a MERC Diplomat

and successfully carrying a project to completion by presenting the results at a national meeting or in a peer-reviewed publication. We tracked Milestone #2 by sending e-mails to participants two to three times per year requesting updates, by reviewing program abstracts from each of three major annual EM meetings (i.e., CORD, SAEM, ACEP), and by conducting annual searches of EM journals most likely to publish education research (*Academic Emergency Medicine*, *Journal of Emergency Medicine*, and *Western Journal of Emergency Medicine*). Generally, one to two years are required to become a MERC Diplomat and up to three years to earn the title "MERC at CORD Scholar."

Additional intermediate outcome indices include (1) the number of education scholarship projects initiated after leaving MERC at CORD that include peers and/or mentors from the program, as determined by the alumni survey (see long-term outcomes) and (2) the development of a community of MERC at CORD Scholars who give back to the program by participating in the education of subsequent cohorts through panel discussions and small-group sessions.

Long-term outcomes

Long-term outcomes are those estimated to take (measuring from beginning the program) three years or longer to develop. We measured long-term outcomes through an alumni survey (we defined alumnus as any prior participant

of the program, including, but not limited to, Diplomats and Scholars).

The alumni survey focused on the effect of MERC at CORD on participants' careers. The 11-item alumni survey consisted of both open-ended questions and those ranked on a five-point Likert scale (see Supplemental Digital Appendix 3 at <http://links.lww.com/ACADMED/A326>). In developing the survey, we followed the guidelines of Artino and colleagues.²⁴ To optimize content-related evidence of validity, we based the questions on a literature review on the topic, on the results of a presurvey inquiring what participants wanted from the experience, and on priorities listed in the logic model. Discussions among mentors and the external consultants served to hone the questions for both content and response process validity evidence. Lastly, seven mentors piloted the survey, and this small pilot resulted in adjustments to further improve response process validity (July 2014).

We initiated the survey in August 2014, collected data for over three weeks, and then closed the survey in early September. In identifying alumni, we found that the e-mail addresses of the members of the inaugural cohort (n = 35) had been lost during a transition in management services. In addition, 9 prior participants had changed e-mail addresses, and an updated address was not available. Consequently, we sent the survey (via SurveyMonkey) to 105 of the 149 (70.5%) potential alumni representing the cohorts from 2010 to 2013. All survey results were anonymous.

Statistical analysis

We analyzed all data (short-term, intermediate, and long-term) using Graphpad Prism (Prism 5.0d for Macintosh, v6.0, 2014). We tested the Likert-format survey response data for normal distribution using the D'Agostino and Pearson omnibus normality test. Because the response data were nonparametric, we used the Mann-Whitney U test to compare outcomes. We calculated descriptive statistics (means, medians, 95% confidence intervals, and quartiles), and we made nominal comparisons using the chi-square or Fisher test. We set alpha at 0.05 for all comparisons.

Table 2

Demographics of MERC at CORD Scholars Program: Classes of 2009 through 2013^a

Year (and no. of participants)	No. (%) of respondents	Mean (range) clinical experience in years	No. (%)			
			Professors	Associate professors	Assistant professors or participants with no title	Residents and fellows
2009 (35)	35 (100)	13.6 (0–30)	6 (17.1)	10 (28.6)	18 (51.4)	1 (2.8)
2010 (34)	20 (58.8)	7.0 (0–23)	1 (5.0)	2 (10.0)	15 (75.0)	2 (10.0)
2011 (32)	27 (84.4)	7.0 (0–28)	0	4 (14.8)	20 (74.1)	3 (11.1)
2012 (24)	24 (100)	5.5 (0–24)	0	2 (8.3)	20 (83.3)	2 (8.3)
2013 (23)	22 (95.6)	5.7 (0–25)	1 (4.6)	1 (4.6)	13 (59.1)	7 (31.8)

Abbreviations: MERC indicates Medical Education Research Certification; CORD, Council of Emergency Medicine Residency Directors.

^aThe authors gleaned the information on this table from the curricula vitae provided by the participants. The information was current when the participants entered the MERC at CORD Scholars Program. Some percentages do not equal 100 because of rounding.

Results

We have presented the demographics for the classes of 2009 through 2013 in Table 2. Twenty of the 149 (13.4%) participants were program directors when they entered the program.

Short-term outcomes

The response rate from 2011 to 2013 was 94% (74/79) for the presurveys and 82% (65/79) for the postsurveys. All 65 respondents reported improvement in skills and knowledge related to education research in several domains, including research question formulation, research methodology, and identification of collaborators/mentors. The posttest improvements in scores are statistically significant ($P < .05$) in each of these domains (see Table 3). Scores on questions related to participants' perception of the program's value for increasing their ability to perform education research and their likelihood of recommending the program to a peer were also very high. For both questions, the mean score was 4.3 (on a 5-point scale where 1 = no value or very unlikely and 5 = very valuable or very likely; results not shown). All 65 respondents reported that they would recommend the program to a colleague.

Because of the change in format from a traditional pre- and postprogram survey in 2011–2012 to a retrospective post-then-pre design in 2013, we combined the survey responses from the 2011/2012 cohorts and compared them statistically with those of the 2013 cohort. Precourse responses to the questions on developing a research question, project design, and

bringing the project to publication were not significantly different across the three cohorts (see Table 3). In contrast, when comparing the 2011/2012 and 2013 cohorts, the precourse survey responses were significantly different for the questions about ability to identify potential peers and the ability to identify potential mentors. Postcourse survey responses were not significantly different across the three cohorts.

To date, 65% (97/149) of the MERC at CORD participants have attained MERC Diplomat status (Milestone #1).

Intermediate outcomes

As mentioned, intermediate outcomes (attained one to three years after beginning the MERC at CORD program) have focused primarily on scholarly output and achievement of Milestone #2 (attaining MERC at CORD Scholar status). As for scholarly products, of the 149 participants, 42% ($n = 63$) have presented a paper based on their MERC at CORD project at one of three major national EM meetings (i.e., CORD, SAEM, and/or ACEP), and 20% ($n = 30$) have authored a peer-reviewed publication based on their MERC at CORD project. As of October 1, 2014, 41% of program participants ($n = 61$) achieved MERC at CORD Scholar status.

Beginning with only the most recent two cohorts (2014, 2015), we have begun to invite prior MERC at CORD Scholars to join the program to mentor current participants during small-group exercises. To date, 14 Scholars (23% of 61) have given back to the program through their participation.

Long-term outcomes

The response rate to the alumni survey was 58% (61/105). Of the 61 respondents, 58 (95%) reported that they had “used what you had learned in the MERC at CORD program in your professional life.” We grouped the clarifying open-text responses to the question “How you have used what you learned?” into three broad categories as follows:

1. Improved ability to perform and complete education research projects (44/61; 72%),
2. Improved ability to teach and/or mentor others on how to perform education research (26/61; 43%), and
3. Improved ability to perform job based on skills and knowledge gained from the program (16/61; 26%).

Specific skills that participants noted in their comments include the following: “searching the literature for important papers,” “analyzing education research publications,” “improving the education I provide,” “creating network[s] and building professional relationships,” and “developing surveys related to the education I provide in my department/institution.”

Of the 60 respondents answering the question, 23 (38%) indicated that they had assumed a new educational leadership role since leaving MERC at CORD, and—importantly—68% ($n = 15$) of these 22 (1 person skipped the question) cited that the knowledge gained from the program played a key role in this advancement.

Table 3

Mean Pre- and Postprogram Scores (With Range) of MERC at CORD Participants' Ratings of Their Education Research Skills on a Five-Point Likert-Type Scale, 2011 to 2013

Question about a specific skill (Likert-type scale response anchors)	2011 and 2012, pre (n = 51)	2013, ^a pre (n = 23)	Total, pre (n = 74)	2011 and 2012, post (n = 42)	2013, ^a post (n = 23)	Total, post (n = 65)
1. How would you rate your ability to formulate a medical education research question? (1 = none; 5 = competent)	2.1 (1.9–2.3)	2.4 (2.0–2.8)	2.2 (2.0–2.4)	4.1 (3.8–4.2)	4.0 (3.8–4.3)	4.1 ^c (3.8–4.3)
2. How would you rate your ability to design an education research project using appropriate methods? (1 = none; 5 = competent)	2.0 (1.7–2.2)	2.1 (1.6–2.4)	2.0 (1.8–2.2)	3.7 (3.4–3.9)	4.0 (3.8–4.2)	3.8 ^c (3.7–4.0)
3. How would you rate your ability to bring a completed education research project to publication as an article? (1 = none; 5 = competent)	2.0 (1.8–2.3)	2.0 (1.6–2.4)	2.0 (1.8–2.2)	3.5 (3.2–3.8)	3.2 (2.8–3.5)	3.5 ^c (3.2–3.8)
4. How confident do you feel in being able to identify potential peers/collaborators in education research? (1 = not at all; 5 = confident)	3.1 (2.7–3.5)	1.9 ^b (1.5–2.3)	2.7 (2.5–3.0)	4.0 (3.7–4.2)	4.1 (3.8–4.4)	4.0 ^c (3.8–4.2)
5. How confident do you feel in being able to identify potential mentors in education research? (1 = very difficult; 5 = not difficult)	3.4 (3.1–3.8)	2.1 ^b (1.6–2.5)	3.0 (2.7–3.3)	3.7 (3.5–3.9)	3.9 (3.7–4.3)	3.8 ^c (3.6–4.0)

Abbreviations: MERC indicates Medical Education Research Certification; CORD, Council of Emergency Medicine Residency Directors; n, the number of people responding to the survey.

^aMean scores from 2013 are reported separately because of a change in survey technique.

^bPreprogram scores from 2013 are significant lower ($P < .05$) than those from the same questions in 2011/2012 corresponding to a change in survey technique.

^cPostprogram scores are significantly different from pre ($P < .05$).

As of October 2014, of the 60 alumni answering the question, 28 (47%) had begun at least one subsequent multi-institutional study related to education. Of these 28 alumni initiating subsequent projects, 16 (57%) have collaborated with one or more peers/mentors from their original MERC at CORD project. To date, 15 of the 28 subsequent projects (54%) have resulted in a research presentation and 7 (25%) in authorship of a peer-reviewed publication.

Discussion

This evaluation, initiated five years after beginning the MERC at CORD program, sought to measure the program's short-term, intermediate, and long-term outcomes. We designed MERC at CORD to be a specialty-specific, longitudinal, mentored education research faculty development program, and our results show that the program has been successful. MERC at CORD participants report that they have learned and applied skills and knowledge, that they perceive the program as valuable, and that they would recommend it to colleagues. Further, program participants have produced national presentations and peer-reviewed articles directly related to

their MERC at CORD projects. Central to this program is the experiential learning paradigm design, as defined by Kolb.²⁵

A number of medical education programs are specifically based on Kolb's model, and many others are built on the importance of learning from experience.^{17,26–30} Key tenets of experiential learning include practicality and context. The MERC at CORD workshops provide participants with timely opportunities to apply or practice the knowledge and skills they are learning (i.e., deliberate practice). Specifically, breakout sessions and other small-group exercises facilitate learning by encouraging participants to immediately relate what they have just learned to their own project. Participants serve in the capacity of education researcher as a mentored apprentice. MERC at CORD provides context and allows each participant to practice, engaging in the role that each hopes to grow into. This approach is consistent with that described by Lave and Wenger.³¹ Prior research has demonstrated that such longitudinal experiential learning has a lasting effect on the career development of participants.^{21,32–34}

According to social learning theory, collaboration and participation in communities of practice amplify what is learned through experience; that is, peers serve as role models who provide a mutual exchange of information and ideas, thereby promoting and maintaining change while simultaneously broadening what is learned.^{31,33,35–37} Group learning is facilitated by proven experiential learning strategies, including sequenced and multifaceted authentic research activities^{21,34,38,39} such as those embedded in the MERC at CORD program. Moreover, the diversity of each project member's background (as based on home institution, prior experience, and geography) adds value to the overall educational experience.³⁷

According to Kirkpatrick and Kirkpatrick's⁴⁰ model of program evaluation, there are four levels of outcomes with lower levels laying the groundwork for substantive change within the individual and the institution. Level 1 pertains to participant satisfaction or reaction; level 2 measures improved knowledge and/or skills. The MERC at CORD pre- and postprogram surveys (and retrospective post-then-pre design) serve to evaluate Kirkpatrick level 1 and 2 outcomes. To illustrate, MERC at

CORD participants, as demonstrated by their reported willingness to recommend the program to interested peers, generally believe that the program has successfully met their need for career development. Further, their responses to a series of questions related to education research abilities demonstrate that the program results in a self-perceived improvement in related knowledge and skills.

Interestingly, the only difference we noted in our transition from the traditional pre-/postprogram surveys to the retrospective post-then-pre design was a significant decrease in the average preprogram ratings of participants' abilities to identify peers and mentors. This difference appears to be the result of a response shift bias. Such a bias generally results from an altered frame of reference provided by program participation.²³ In other words, participants did not realize the degree of difficulty associated with identifying peers and mentors until their experience in the MERC at CORD program. Our 2013 survey results demonstrate an advantage of the retrospective post-then-pre design over the traditional pre/post survey.⁴¹⁻⁴³

Even in the planning stages, the program developers recognized the importance of documenting and celebrating successful attainment of program-related milestones. As a result, priorities have included the attainment of outcomes such as MERC Diplomat status, and subsequent completion of a research project to become a MERC at CORD Scholar. Additional intermediate and long-term outcomes include the perception of improved job performance, career advancement, and the development of subsequent education research projects with peers/mentors of the program. These changes, which provide a measure of program validity, are consistent with program-induced changes in behavior or Kirkpatrick level 3 outcomes. Based on the available data, it is unclear whether the program has had an impact on program director retention. That all presentations and publications resulting from MERC at CORD are multi-institutional, especially at a time when scholars and educators are calling for greater rigor and multi-institutional design,^{44,45} suggests the potential for Kirkpatrick level 4 outcomes with time.

Programs that involve groups that meet over an extended time have a tendency

to facilitate the creation of networks and cooperative interactions among colleagues.^{20,46} This outcome is also true of collaborative research projects.^{29,47} An important goal of MERC at CORD continues to be the development of networks or communities of education research practice that transcend the duration of the program.^{9,16} The communities that have grown from MERC at CORD projects appear to be providing their members with the ongoing resources necessary to overcome several of the barriers that individuals developing a career in education research have identified.^{6,9-14} Specifically, these communities offer members expertise, mentorship, and supportive networks. Further, we have gathered, through conversation with alumni, that MERC participants feel their communities have supported them professionally beyond expanding their education scholarship knowledge and skills to providing avenues that have led to promotions and new leadership roles.

The larger community that has grown from this program has played a role in the implementation of further research developments in EM, including an increase in the dollar amount and variety of CORD education grants,⁴⁸ the inauguration of an education supplement through the *Western Journal of Emergency Medicine*,⁴⁹ and tiered professional development opportunities in education scholarship through the CORD Academy of Scholarship that has built on the MERC at CORD experience.

Costs and limitations

CORD pays the AAMC to cover the following costs for each workshop: workshop director's transportation, meals, lodging (one to two nights), and a \$500 honorarium. To defray these costs, participants pay a registration fee of \$150 per workshop. The director and mentors donate their time to the program. Annually, CORD breaks even on this program.

We note several lessons learned and limitations to this program and its evaluation. For instance, no completed research projects have come from MERC at CORD's inaugural year. With each subsequent cohort, the mentors and program have become more adept at promoting project completion, which in turn has resulted in a progressive increase

in the number of national presentations and publications. In reviewing the current outcomes, we remain cognizant of the fact that it takes an average of two to three years for publications to come to fruition. Given that the fifth-year cohort graduated from the program in March 2013, further long-term outcomes from these first five years will take several more years to be fully realized.

This study lacks a true control group. Arguably, the best controls are the participants themselves because they self-selected for this opportunity. The outcomes data, particularly those derived from the alumni survey, demonstrate an impact on participants' careers. Though many are self-perceived, findings such as participants' subsequent work on research projects with mentors/peers from MERC at CORD and their willingness to give back to subsequent cohorts clearly demonstrate successful navigation of a common obstacle in education scholarship: a lack of mentors. Our outcomes, though self-reported, demonstrate a community of practice that nurtures further career development.

Self-report methods, even when well performed, remain vulnerable to bias based on variability in individual self-assessment and a lack of reliability. In addition, research indicates that program participants who voluntarily work to improve their skills tend to overestimate what they have learned.⁵⁰ Nonetheless, the substance of such outcomes as the number of project presentations/publications, successful subsequent collaborations with MERC at CORD peers and mentors, and the perceived use of this learning to enhance participants' overall career are strongly suggestive of a positive effect on knowledge, skills, and behavior.

Finally, the alumni survey with a 58% response rate likely contains a degree of response error. Those participants who have been most engaged in the program may be the individuals most likely to have perceived benefit from the experience and, as a result, the ones most likely to complete the survey. To that extent, results of the alumni survey may not apply to the nonresponders.

Future considerations

The MERC at CORD program developers believe that this program contributes

to the ability of clinician–educators to overcome personal barriers to successful education scholarship, most importantly the lack of expertise, difficulty in identifying mentors, and a deficient support network. According to Kirkpatrick and Kirkpatrick,⁴⁰ the success of any program is dependent on two factors that are beyond the control of the individual: a supportive work environment and perceived rewards for change. Institutional barriers to education research remain a major obstacle to the development of academic faculty who are able and willing to carry out high-level scholarship. Protected time for scholarly pursuits, financial support, and recognition of accomplishments remain important limitations and must be overcome for medical education scholarship to grow, prosper, and meet expectations.

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