

TWELVE TIPS

Twelve tips for conducting collaborative research in medical education

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Abstract

Background: Developing and ensuring successful collaborative research in medical education is no small task, but the rewards to researchers can be great. Collaborative research in medical education offers significant opportunities for investigators who wish to pool limited resources and expand professional networks. Despite this, collaboration often occurs without advance planning for the logistical aspects of collaborative work.

Aims and Methods: These 12 tips, derived from developing and presenting a session on strategies for effective collaboration conducted at a national meeting, will assist readers who are planning to collaborate or are already engaged in collaborative scholarship. The tips are organized into items to consider in three phases of collaboration: planning, implementation, and dissemination of outcomes.

Results and Conclusions: From selecting a topic to recognizing when the collaboration should end, the tips underscore the importance of good communication, and clear expectations for participants.

Introduction

Collaborative research in medical education offers significant opportunities for investigators who wish to pool limited resources and expand professional networks. Collaboration also enhances research design so that intervention and investigation can occur in a number of comparative settings and provide rigor to an investigation (Gruppen 2007). Multi-site research poses obvious logistical challenges and has therefore been difficult for many investigators to employ (Gruppen 2007). Unfortunately, this has contributed to a persistent criticism of medical education research, namely the lack of high quality, rigorous studies whose results are unable to be generalized to multiple settings and schools (Carney et al. 2004).

Developing and ensuring successful collaboration is no small task. Collaborative groups form around a common idea or shared interest or in response to a Request for Proposals (RFP). Often lacking organizational structure, administrative oversight, and support, and defined leadership and funding, a team must negotiate and navigate these challenges during the early stages of group development. Colleagues that successfully meet initial goals must then determine how to maintain interest and enthusiasm for the collaboration, share the workload, and assign credit for scholarly products developed by the collaboration.

The authors of this article facilitated a small group discussion at the Annual Meeting of the Association of American Medical Colleges (AAMC) in November 2009. The session addressed the following topics: strategies to initiate and sustain research collaborations; models for structure and

governance; options for scholarship and authorship; and considerations for funding and research compliance. The session generated considerable discussion about the challenges facing those who wish to engage in collaborative work, as well as ideas for best practices to ensure successful collaboration in medical education research and scholarship. The authors documented ideas shared during the session and one author (Jillian M. Ketterer) used the micro-blogging service Twitter (www.twitter.com) to post brief, real-time session “tweets” or notes to the AAMC Twitter feed for the Annual Meeting. We would like to share Twelve Tips that emerged from our review of the literature; this session; and, where appropriate, observations from our own professional experiences with collaborative research and scholarship. The tips are organized by three phases that characterize collaborative work: planning, implementation, and dissemination of outcomes.

Planning

Tip 1

Choose a do-able, exciting topic

Scholarly projects are judged using Glassick’s (2000) criteria. Establishing clear goals and refining the study question are key steps in the initial planning process (Beckman & Cook 2007). Initial “brainstorming” to identify the interests of the participants allows candid conversation about possible topics for the project. During these early conversations, participants should

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be encouraged to express their passions, share their experiences, and define their areas of expertise. The group must then clarify the aims and purpose of the project. The passions of the participants should be considered at this point as members are most likely to be enthusiastic if they are excited about the question to be answered and the outcome to be measured. A review of the literature will ensure that the participants establish the importance of the questions they wish to address. This step confirms the reason for the study and is a critical element to ensure that the standards of scholarship are met. A useful mnemonic to guide the development of a study question in education as well as in clinical research is FINER: is the project feasible, interesting, novel, ethical, and relevant (Hulley & Cummings 1988). Feasible projects are reasonable in their scope, use practical methods, and measure important outcomes.

At times, as the purpose of the project is defined, it will become clear that there are actually a number of questions that can be addressed; it is at this point that the team should consider the creation of smaller subgroups to approach different aspects of a larger project. Priority should be given to those aspects that are “doable” at the current time with currently available resources.

Tip 2

Identify enthusiastic people who will work without funding during the start-up period

Establishing a collaboration for medical education research or other scholarly activity is not unlike creating a start-up business. In both cases, creative, motivated individuals identify a need and decide to pursue a good idea. Entrepreneurs who have insufficient capital or are unable to identify outside investors to invest in the new business often rely on “bootstrapping” or self-funding their startup business (Bhide 1992). Similarly, educators who wish to pursue a collaborative project typically donate their own time and resources to the initiative. Funding for education research and innovation is already limited, and proposing a new project or program that lacks a track record is even less likely to garner funding.

Research on faculty motivation and interdisciplinary collaboration offers insight into why faculty members engage in work when traditional rewards or administrative support are not immediately available. In their report on faculty motivation, Blackburn and Lawrence (1995) noted that faculty members are motivated by work they feel they are good at doing and will devote time to projects that interest them. Lattuca and Creamer (2005, p8) have proposed that “for interdisciplinary collaborators, the intellectual benefits of talking across boundaries are as important as (and perhaps more important than) the traditional rewards associated with academic work.” This intrinsic motivation, coupled with interest in collegial and sometimes interdisciplinary work, was described by the presenters and participants at our session who shared multiple examples of initiatives that began without funding but persevered because of the enthusiasm of the people involved.

Tip 3

Create infrastructure: roles, timelines/ deadlines, expectations

Participants in a collaborative medical education research project share a primary interest: that the project be successful. Commitment to the effort is gained not only through shared goals but also through shared responsibility (Kouzes & Posner 2008). Each member brings expertise and a perspective that contributes to this success, and the relationships that develop between members add value to one’s professional life and allow professional skill development (Gersick et al. 2000). Efficiency is gained through sharing resources and skills but equity is important so that all members can contribute and benefit from the collaboration (Gruppen 2007). It is important to discuss the roles, expectations, and needs of each of the members as well as the needs of the group as the group comes together. It is also critical to establish a process to address any problems or concerns that arise as different stages of the project evolve. How will the group ensure accountability of its members? Collaborations must be negotiated and managed to prevent conflict and maintain relationships throughout the process.

Open conversation at the beginning of the collaboration allows a thorough exploration of how the tasks and workload of the group will be divided. This list of “to do’s” should include a definition of how the group will work together – will the work be done electronically via email communication, on scheduled conference calls, using web-based meeting resources, or document-sharing capabilities, etc.? After defining the process and tasks, the group can assign responsibilities to the members and establish a timeline with benchmarks that outline “what” is expected of each member and “by when” this result will be required to ensure ongoing progress. A leader or leaders for different aspects of the work should be named and empowered to serve in this role. Members should be encouraged to be honest about the amount of time and effort they can contribute and about times during which they may not be able to participate at the same level. In addition, the leader(s) must be prepared to address problems or conflict between members.

Tip 4

Develop the criteria for authorship early

The criteria for authorship are well established (International Committee of Medical Journal Editors [ICMJE] 2008). Each author must make substantial contribution to the design of the project, data acquisition, and/or analysis of the project results and outcomes, and to the production, revision, and final approval of the scholarly products.

Authorship is a reward that recognizes the contributions made by each member of the team but being an author carries a responsibility to meet and verify these criteria and to take responsibility for the content. Acknowledgment is reserved for contributions that do not meet the standards of authorship. For example, a colleague may provide some advice about the

project or offer to review a written manuscript to provide feedback before submission, but not be able to be a part of all of the steps outlined above. This colleague's contribution can be acknowledged but he/she should not be listed as an author.

Multiple types of scholarly products may result from the collaboration (e.g., manuscripts, abstracts, workshops, presentations, and educational products). Criteria for authorship should be discussed early and the order of authorship should be negotiated and discussed early and again as the creation of each scholarly product begins. The order of authors on any scholarly product reflects the level of contribution. If all authors contribute equally, the group may consider rotating first authorship on different products, thereby allowing all of the contributors to be recognized in this way. A participant may wish to be the first author for a presentation to a specific national organization of which they are a member. This participant can be expected to take responsibility for managing the process to create and submit the product and also to organize the work to prepare the actual presentation. The first author on a manuscript is usually expected to write the first draft or assign portions of the article to the various members. The corresponding author is usually the first or senior author on the paper and would be the person responsible to communicate with the journal's editorial staff. Depending on the structure of the collaboration, the group may decide to use the name of the collaborative on all scholarly products with individual contributor names listed below or in a separate location.

Tip 5

Identify resources/seek opportunities to fund the collaboration

Collaborations must eventually find resources to support their endeavors, and many institutions encourage researchers to seek external funding. Universities and academic institutions often have a centralized office for grant information, but there are also many resources available on the Internet (e.g., www.grants.gov) to help researchers identify grants. According to Bordage and Dawson (2003), funding agencies will typically focus on four main criteria in evaluating grant applications: the relevance of the study to the agency's mission, whether the study is scientifically sound, the qualifications of the researchers to conduct the study, and the adequacy of the budget and timeline. The importance of research quality, particularly with regard to research design and methodology, cannot be overemphasized. Reed et al. (2007) found a positive correlation between published research quality and funding, using an instrument that measures study quality across the following six domains: study design, sampling, type of data, validity of evaluation instrument, data analysis, and outcomes. These domains may provide researchers with an objective framework for assessing and improving the quality of their studies.

Application requirements should also be thoroughly researched to ensure that a grant is a good fit for the project, and once an appropriate grant is selected, these requirements should be shared with collaborators and strictly followed.

Researchers should remember that the application represents the work of the collaborative; so, it should be carefully reviewed by all participants before submission. Any rules that one's institution imposes on grants (e.g., related to indirect costs) should be noted and shared with collaborators. These restrictions/issues must be considered when creating a budget or proposal for external funding. Attention should also be paid to non-financial resources (e.g., staff support, photocopier machines, technologic support, etc.) that will be needed to sustain the collaboration. These costs must also be accounted for in the business plan created for the project.

Tip 6

Obtain Institutional Review Board approval

If the collaboration engages in research it will be necessary to obtain approval from at least one, and perhaps multiple, Institutional Review Boards (IRBs). All research involving human subjects, including educational research, must be reviewed and approved by a local IRB (United States Department of Health and Human Services [DHHS] 2009). Most granting agencies and academic journals now require certification that IRB approval was obtained. The primary purpose of the review is to ensure and protect the rights and welfare of the participants in the research. Most colleges and universities will have at least one IRB, often more. This leads to considerable variation in the policies and procedures enacted by each IRB (Miser 2005). It is critical that each member of the collaboration becomes familiar with the review process at their institution (Tomkowiak & Gunderson 2004). Approval at multiple institutions takes time and effort.

In our November 2009 session on best practices for collaboration in medical education research and scholarship, we learned that some collaborations have found it effective to initiate the review process at one institution where the researcher has a record of successful experiences working with the IRB. Other participants can learn from that application and process, and cite that school's IRB approval in their own application letter. We also learned that it is important to be very clear in the application when explaining the research activities that will occur on each campus, and, in particular, the type of research activity that will occur on each researcher's home campus. The application must also provide detailed information about the recruitment of participants, incentives, research methods, and analysis. Well in advance of submitting the IRB application materials, the members of the collaboration should discuss these issues and identify requirements that may differ by institution, such as policies for using archived student data or the dollar amount permitted for survey incentives. Thorough discussion of these issues is particularly important when partnering with institutions outside the US and Canada, and may uncover additional, potentially time-consuming issues related to culture and currency. The general rule for international collaborative research is that IRB approval is usually required from each participating country (Musil et al. 2004).

Implementation

Tip 7

Meet regularly

There is evidence that distance between researching partners decreases productivity (Katz & Martin 1997). Collaborations, particularly those that involve colleagues at other institutions, require repeated and consistent “connectivity” to remain cohesive and productive. Because most multi-site collaborations rely upon virtual meetings of one sort or another (teleconference, telephone, and email), the collegiality and sense of community that seem to develop easily with face to face meetings must be more consciously constructed. Regular meetings provide an excellent strategy for developing this important sense of community and make the collaboration “real,” which leads then to a sense of commitment to the collaborative initiative. Scheduling meetings is often a challenge; thus, the key to successful regular meetings is to schedule them at the beginning of the collaboration, for example, the third Monday of each month at a particular time (keeping in mind the time changes that may exist between locations).

Regular meetings provide collaborators with opportunities to update one another on progress toward completion of assigned tasks and to plan next steps; however, they also serve to motivate group members, create accountability, and help them to bond. In our experience with telephone meetings, for example, we have found that the “catch up” conversations that occur prior to the official start of the meeting foster the development of relationships that promote commitment on the part of the participants. This dedication is critical to the success of multi-site projects. Producing and sharing meeting notes is also important to the success of the collaboration. Collaborators who miss a meeting can then stay current and feel connected to collaboration activities. Finally, regular meetings should be held even when attendance promises to be very small; even a few collaborators talking together on the telephone will produce positive results and reinforce cohesiveness. We have found that canceling meetings is harmful to the group dynamic. In one multi-site collaboration we participated in (Kathryn N. Huggett, Ruth Greenberg), we found that when monthly meetings stopped being strictly enforced, the collaboration weakened and progress stalled. Regularity fosters structure and anything the convener can do to facilitate this sense of solidarity and group activity strengthens the group connection.

Tip 8

Educate your institution; make benefits of collaborative work visible to your institution and institutional leaders

The importance of not only obtaining but maintaining institutional support when embarking on a collaborative venture was highlighted by participants at the November 2009 session. Garnering the support of university deans or

departmental directors is worth the effort; the more leadership feels invested in your research, the more likely they are to support it when the time comes to make budgetary decisions or to determine priorities in strategic planning exercises. Researchers should consider how their collaborative project might speak to the goals or vision of the institution, and include that perspective in discussions with leadership as well as in any materials shared internally. Collaborators can gain support by demonstrating for institutions the benefits of working collaboratively, as well as educating them about the steps involved. Interim research results can be presented at brown bags, Education Grand Rounds, or school- or department-level research conferences. Updates about progress with the collaboration, including any resulting publications, can also be posted on institutional websites. Because the goal is not only to educate institutions about the research, but also the process of collaboration, it can be helpful to document the process thoroughly from the very beginning.

Institutional support can also be gained by involving others in the institution in the collaborative research. LeGris et al. (2000) found that meaningfully engaging and recognizing contributions from key staff at all levels in the institution – not just management – can increase organizational commitment to the research. To that end, colleagues and staff should be called upon for expertise and to participate in surveys and focus groups. Deans are valuable contacts at member institutions and should be considered a strategic resource throughout the collaboration.

Tip 9

Draw upon technology

While technology is certainly no panacea for the difficulties of starting and maintaining a collaboration, there are online tools available that can make aspects of collaborative research much easier and more efficient. Few would argue against the benefits of email for communication, but project management platforms such as BaseCamp (www.basecamp.com) and Zoho Projects (www.projects.zoho.com) can take the benefits of the internet a step farther by serving as a communication “home base” or “hub.” Milestones, meeting dates, and assigned tasks can be posted for all collaborators to see, and automatic email reminders can be generated to keep members “on task” and engaged. Tools such as Remember The Milk (www.rememberthemilk.com), HiTask (www.hitask.com), and Evernote (www.evernote.com) are also available for task management and memory-jogging, and companies such as PBworks (www.pbworks.com), and Wikispaces (www.wikispaces.com) offer free wikis that can facilitate collaborative writing and agenda planning. To make scheduling meetings more efficient, Doodle (www.doodle.com) is a free, web-based service that polls members for their availability and displays the results in a simple table for the user. Free, online videoconferencing services such as MeBeam (www.mebeam.com) or Vyew (www.vyew.com) can help when collaborators want to meet in person but distance does not permit. There are also free tools available for research; for

example, BiomedExperts (www.biomedexperts.com) is a citation-based social network that can aid in expert-finding, and CiteULike (www.citeulike.org) enables users to store, organize, and share scholarly papers of interest. A targeted web search will uncover a number of free tools for many other relevant purposes; however, researchers should first carefully evaluate whether a tool is needed and, if so, take steps to identify the most appropriate one. Collaborators should avoid tools that will complicate as opposed to simplify the process. Finally, before utilizing any technology for collaboration, it is important to ensure that all members are comfortable with the technologies involved.

Tip 10

Encourage participation by everyone; find champions for specific tasks

Convening a group of motivated and enthusiastic colleagues will only take you so far. To be effective, collaborations require active participation by all members in order to complete the group's work and sustain organizational momentum. There are multiple benefits to a collaboration that engages all members of the group. First, the diversity of experiences and expertise enrich the collaboration, and this is lost when members do not participate. Second, active and ongoing participation promotes an efficient group process. When all members participate, time is not lost on activities such as providing updates to absent members or tracking them down to confirm they will complete an assigned task. Finally, a group with too many "free riders" will quickly exhaust the time and energy of the small number of dedicated group members who conduct the work of the collaboration.

Understanding group dynamics promotes the continued success of the collaboration. Two frameworks highlight aspects of group work and the key features of different stages of working in teams. Tuckman (1965) and later Scholtes et al. (2003) described four stages of team growth: forming; storming; norming; and performing. Tuckman later added a fifth stage, adjourning. Tuckman advised that to be effective, groups need to go through all stages, beginning with the forming stage, marked by excitement and caution, before they reach the performing stage, characterized by constructive activity and attachment to the group. Amey and Brown (2005) described three stages of collaboration across four dimensions – discipline orientation, knowledge engagement, work orientation, and leadership. Not unlike Tuckman and Scholtes, they learned that the work orientation begins with a focus on the individual. In Stage Two, the emphasis shifts to the group and norming, and in Stage Three the collaboration functions as a team, with shared responsibility for the outcomes. Tension and conflict may arise during the initial stages, but by Stage Three, the team demonstrates active listening, adaptability and willingness to advance the work of the team. Recognizing these stages of group cohesion will help collaborations anticipate and address challenges and develop strategies to promote participation throughout the life of the project.

Predictably, participation will vary by task and phase of the project. When the group determines that it is more efficient to work in small groups or make individual assignments, it is especially important to identify at least one individual who will serve as the overall leader or coordinator. This individual will monitor the progress of the sub-groups or individuals, and ensure that materials are shared and efforts are not duplicated. This may be the same person who initially convened the group, but this is not essential. Ideally, the collaboration will always have at least one core, continuous champion for the project, but other leaders may emerge as the work progresses. Being clear about roles and expectations is always a good idea, especially if collaborators are not located in close physical proximity and face to face communication is not possible. Communication via email or phone can lead to misunderstandings and misperceptions if conversations are not candid and leaders are not attuned to interpersonal issues and unspoken concerns. The manner in which the leader will be recognized, the scope of the leader's responsibilities and the period of service or term of the leader should be defined. The group may also want to establish a process for choosing between two individuals who would like to lead the collaboration.

Even with effective leadership, a collaboration may identify areas of expertise that are lacking among the membership. When this occurs, it may be useful to define a process to add members or to solicit help from a nationally recognized researcher or organization.

Tip 11

Recognize when collaboration should end/change direction

Successful collaborations produce results, primarily in the form of new understandings about a particular topic or issue. Dissemination allows the collaborators to share their results; however, dissemination often means the end of the project and thus, of a successful collaboration. This is natural. But, in some cases, collaborations do not jell or do not produce the anticipated results for a variety of reasons (i.e., waning interest on the part of collaborators, lack of funding or time, etc.) When these kinds of situations occur, the goal is to reach closure collegially, without acrimony or blame. This can be accomplished if concerns are shared openly, difficult conversations are managed effectively, and termination is not prolonged. In the case of a formal collaboration – one resulting from a grant or organizational affiliation, for example – a succession plan should be developed during the planning stage to address the possibility of a change in personnel and the participants should discuss what will happen when the grant expires to ensure appropriate closure to the work. Some successful multi-site collaborations develop a life of their own, with collaborators creating spin-off studies on the same or new topics. One of the greatest benefits of multi-site collaborations is that they create opportunities for medical educators to network with like-minded colleagues, who, in turn, invite one another to participate in future collaborations.

Dissemination of outcomes

Tip 12

Seek out opportunities to share/disseminate results

One of the benefits of multi-site collaborations is their potential for increased dissemination. As noted in Tip 4, issues of authorship should be addressed early and with each discussion of a presentation or publication about the outcomes of the project. With several individuals seeking opportunities to disseminate the work of the team, the number of opportunities for dissemination increases. For example, one author (Ruth Greenberg) recently published in a journal that was not familiar to her at the suggestion of a collaborator. Similarly, collaborators working in different regions of a country (or internationally) may receive information about regional meetings that the other collaborators do not usually attend. Staying alert to opportunities to disseminate the results of the collaboration is the job of every collaborator; this article, in fact, was the result of one collaborator's suggestion. With a team of collaborators, the opportunity exists to cast a wider net, which, in turn benefits all of the collaborators and contributes to a wider community of educators.

Conclusion

Multi-site collaborations in medical education are not without their problems. The lack of physical proximity requires that collaborators be sensitive to the building of a sense of community and the need for accountability to the group; multi-site collaborations also make IRB approval more complicated. However, their benefits far outweigh their disadvantages. As Katz and Martin (1995, p24) suggest, "Collaboration is greater than the sum of its parts." Sharing the workload, developing new professional relationships, sharing resources and skill sets, and expanding the dissemination possibilities make the effort required to plan and sustain these collaborations extremely worthwhile, both professionally and personally.

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