A Novel Program Trains Community-Academic Teams to Build Research and Partnership Capacity

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Abstract

The Community-Engaged Research Team Support (CERTS) program was developed and tested to build research and partnership capacity for community-engaged research (CEnR) teams. Led by the Northwestern University Clinical and Translational Sciences Institute (NUCATS), the goals of CERTS were: (1) to help community-academic teams build capacity for conducting rigorous CEnR and (2) to support teams as they prepare federal grant proposal drafts. The program was guided by an advisory committee of community and clinical partners, and representatives from Chicago's Clinical and Translational Science Institutes. Monthly workshops guided teams to write elements of NIH-style research proposals. Draft reviewing fostered a collaborative learning environment and helped teams develop equal partnerships. The program culminated in a mock-proposal review. All teams clarified their research and acquired new knowledge about the preparation of NIH-style proposals. Trust, partnership collaboration, and a structured writing strategy were assets of the CERTS approach. CERTS also uncovered gaps in resources and preparedness for teams to be competitive for federally funded grants. Areas of need include experience as principal investigators, publications on study results, mentoring, institutional infrastructure, and dedicated time for research. Clin Trans Sci 2012; Volume 6: 214–221

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Introduction

For more than a decade, community-engaged research (CEnR) has been gaining popularity as a valuable method for ascertaining the roots of health problems and providing culturally relevant strategies for improving outcomes and reducing health disparities.[1,2] The term CEnR is used to encompass a range of strategies including community-based participatory research (CBPR) and practice-based research (PBR). CBPR is an orientation to research that emphasizes equitable partnerships between academic and community researchers, draws on strengths, and involves all partners in each stage of decision making.[2] PBR performs research studies with clinical practices, incorporating principles of participatory research[3] in order to improve care provision and the health of patients.

Federal agencies and private foundations are allotting increasing funding to CEnR studies.[4] The National Institutes of Health (NIH) Clinical and Translational Science Award (CTSA) program, instated in 2006, increased emphasis on CEnR and continues to provide resources for CEnR infrastructure at CTSA institutions[5]; nevertheless, there is no blueprint of best practices to follow for establishing infrastructure to support rigorous CEnR scholarship. A survey of principal investigators awarded NIH funding at a CTSA institution reported less than half of investigators had engaged communities in research.[6] Others who have studied CEnR practices have documented a need for CEnR infrastructure, faculty support, mentors, funding, and training.[5,7-9]

Separate programs and recommendations for faculty development in CEnR[8] and for community-partner capacity building[10,11] have been documented. Faculty training for CEnR and grant writing usually focus on partnership-building skills, while community training generally focuses on improving research competencies. To address individual needs, training programs may offer separate, parallel tracks for community and academic researchers.[12] Other mechanisms to increase CEnR skills have included a conference,[13] seed grants,[11] and academic incentives.[14] Because mistrust and cultural barriers may exist between community partners and academic researchers,[15] bringing teams together for training could alleviate misunderstandings. However, we could not locate any programs in the literature specifically designed to build capacity of community and academic partners together. Piloting a program for CEnR teams could address the need for increasing collaboration and helping teams advance partnerships and research goals.

Introduction to Community-Engaged Research Team Support (CERTS)

The Community-Engaged Research Center (CERC— http://bit.ly/rmczSd) in the Northwestern University Clinical and Translational Sciences (NUCATS) Institute cultivates collaborative research partnerships between Chicago-area community organizations, community-based clinicians, and Northwestern University academics. Community partners and academic investigators, including community-engaged faculty whose primary academic appointments do not include research, access CERC resources and support. CERC offers seed grants ranging from $10,000 to $40,000 to foster partnership growth, research skill development, and preliminary data collection. The seed grant program has helped to develop collaborative teams and to generate pilot data about questions relevant to communities and faculty. While some have gone on to receive external funding, seed grant research teams have requested additional support to obtain external grants.

To help teams advance beyond pilot studies, CERC developed the CERTS program with a CTSA administrative supplement grant to the NUCATS CTSA award. CERTS was designed to build on seed grant successes and leverage resources to provide support for ongoing research and aid teams in applying for NIH funding.

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Month	Activity	Workshop topic	Webinar topic*
1	• CERTS program development	N/A	N/A
2	• CERTS program development • Advisory committee reviews and comments on team applications	N/A	N/A
3	• Workshop • Webinar • Draft grant sections	• Introduction to CERTS	• Partnership building and sustainability
4	• Workshop • Webinar • Draft grant sections	• Developing the research question	• Identifying funding opportunities
5	• Workshop • Supplemental workshop • Webinar • Draft grant sections	• Overview of typical grant application sections and how to write them: Specific Aims • *Supplemental*: How to search PubMed and Web of Science	• Collaborative research design, methods, analysis
6	• Workshop • Webinar • Draft grant sections • Midproject progress report	• Overview of typical grant application sections and how to write them: Significance, Innovation, Approach	• Maintaining effective mentor relationships
7	• Workshop • Supplemental workshop • Webinar • Draft grant sections	• Overview of typical grant application sections and how to write them: Approach (continued) and remaining sections • *Supplemental*: Writing for publication	• Constructing research budgets and managing funded projects
8	• Workshop • Supplemental workshop • Webinar • Draft grant sections	• Writing about community-engaged research for publication • *Supplemental*: Mentoring competencies	• Tips and strategies for funding community-engaged research
9	• Workshop • Final proposal submitted and assessed by external reviewers • Conference calls for external review feedback	• CERTS wrap up, discussion of sustainability, team partnership planning	• NIH review process and funding opportunities
10	• Workshop • Administrative wrap-up	• External review synthesis	
11	• Advisory committee and team evaluation	N/A	N/A
12	• Advisory committee and team evaluation	N/A	N/A

*To view the webinars, visit http://www.nucats.northwestern.edu/community-engaged-research/seminar-series-and-events/index.html#CERTS.

Table 1. CERTS time line.

NIH grants were targeted because of their credibility, impact, scale of award, and alignment with university objectives to increase the number of NIH-funded faculty. Based on a review of the literature, experiences with CERC seed grants, and conversations with community-engaged researchers, we devised five premises that laid the foundation for CERTS:

(1) Achieving optimal CEnR requires teams to collaborate fully on all aspects of the research partnership, including planning and writing grant proposals.
(2) Funding is crucial for the participation of community and academic investigators whose primary job responsibility is not research.
(3) The CERTS curriculum—a structured sequence of training activities—equips teams to collaboratively produce a competitive federal grant proposal.
(4) A trusting, collaborative, peer- and expert-mentoring setting helps teams increase knowledge and capacity to write grants and develop relationships that extend beyond CERTS.
(5) An advisory committee composed of academics from Chicago's three CTSAs and leaders from Chicago community organizations is necessary to guide the CERTS curriculum. Such a group would lead to collaboration and implementation of CERTS elements across institutions.

CERTS was designed to be an intensive pilot program (September 2011–August 2012), to (1) help community-academic teams build capacity for rigorous CEnR, and (2) lead the teams to write a draft of a federal grant proposal by the end of the program. This paper describes the development and implementation of CERTS and shares lessons learned that may help institutions enhance infrastructure and supports for CEnR.

Methods

Teams

At the beginning of CERTS, six invited teams submitted an application describing research and partnership goals and a self-assessment to measure team and individual partner competencies. Applications were reviewed by advisory committee members (see '*Advisory Committee Expertise*' for details). Each team was awarded $20,000 to use for time and/or resources to support CEnR efforts. The division of funds between community and academic partners was determined by the teams.

Member	Member affiliation	Perspective	Role
1	Alivio Medical Center	CBPR	Community Curriculum Advisor
2	Alliance of Chicago Community Health Services	PBR	Community Curriculum Advisor
3	Northwestern University	CTSA, Career and Education Development	Education Advisor
4	Northwestern University	CTSA, NIH grant writing	Education Advisor
5	Northwestern University	CTSA, PBR	Community Advisor
6	People's Resource Center	CBPR	Community Advisor
7	Illinois Maternal and Child Health Coalition	CBPR	Community Advisor
8	University of Illinois at Chicago	CTSA, CBPR	Academic Advisor
9	University of Chicago	CTSA, CBPR	Academic Advisor
10	University of Chicago	CTSA, CBPR/PBR	Academic Advisor
11	University of Chicago	CTSA, PBR	Academic Advisor

Table 2. CERTS advisory committee composition.

CERTS training curriculum

CERTS addressed the needs of CEnR teams as a whole rather than focusing on individual researchers. The curriculum was comprised of 2-hour interactive workshops and webinars over 8 months, with 2 additional months spent on planning and 2 months spent on evaluation (*Table 1*). Advisory committee members were paired with teams to review the applications and to provide feedback. Curriculum topics (*Table 1*) were selected to provide teams with information, resources, and practice needed to write a federal grant proposal. Content also was informed by team needs described in applications and self-assessments. Each month, one in-person workshop and one related didactic webinar were presented. Sessions focused on partnership enhancement strategies, research question development, writing strategies, and the NIH grant proposal process. We adapted and utilized existing resources, particularly within NUCATS, as much as possible. Providing direction on research methodology was beyond the scope of the curriculum but resources were available for teams through other NUCATS programs.

CERTS workshops were highly interactive and guided teams to understand components of NIH funding proposals. Methodology was modeled after the Grant Writers Groups (GWG) developed during the past 15 years by Dr. Richard McGee, a Northwestern University member of the advisory committee. For CERTS, participants composed monthly drafts of specific NIH grant application sections: Specific Aims, Significance, Innovation, and Approach. Led by Dr. McGee, the workshops taught teams to constructively critique drafts and help each other strengthen research questions and writing through an in-depth, iterative feedback process, with dual emphasis on writing style and research design. Discussion of each team's work was audio recorded for their later use in making revisions. Monthly didactic webinars (45–60 minutes recordings) and accompanying resources provided additional opportunities to build capacity (*Table 1*). After all sessions, participants completed an evaluation to determine if session learning objectives were met. We offered three supplemental, interactive workshops (*Table 1*) in response to needs that became apparent during the workshops. The supplemental sessions were open to the public and gave teams the opportunity to hone skills outside the targeted scope of the CERTS curriculum.

In addition, CERTS included a midproject project report and final, external proposal review. For the midproject report, teams submitted as much of the NIH proposal section drafts as they had completed to the same advisory committee members who reviewed their initial application. Each team received written comments on their draft and discussed progress and next steps with advisory committee members. The external proposal review was conducted by experts identified in collaboration with Community-Campus Partnerships for Health (CCPH—www.ccph.info), a national organization that promotes health equity and social justice through partnerships between communities and academic institutions. Twelve community and academic CEnR investigators experienced with NIH grant funding and review were recruited from across the country to assess the final proposal drafts and discuss the reviews via conference calls with the teams.

Advisory committee expertise

An advisory committee (*Table 2*) was convened to provide educational direction and occasional mentoring for teams. Two advisory committee members assumed a larger role as community curriculum advisors to ensure programming met the needs of community partners. Special emphasis was placed on the community perspective because research often is more familiar to academics and many resources adapted for CERTS had been developed for academic researchers. We strived to give teams common ground from which to build their research and proposals. All members reviewed initial team applications and midproject progress reports, and gave guidance on strengthening research projects and setting appropriate goals. Advisory committee members were paired with teams who shared research interests and methodological approaches. They were matched with same teams for initial application and midproject progress reviews so they could develop rapport and observe team progress during the entire program. Some members served as workshop or webinar speakers and all participated in the evaluation at the end of the program.

Budget

The CERTS budget comprised approximately $350,000 in direct costs, almost entirely financed by the administrative supplement to Northwestern University's CTSA grant. The budget covered 5–10% full-time effort of faculty and staff who contributed to the design and implementation of CERTS and included a full-time project manager. In addition, advisory committee members received $1,000 honoraria in recognition of their time, with the

community curriculum advisors receiving compensation of $7,500 for their expanded role. Subcontracts with the two other Chicago CTSAs allowed representatives from the institutions to participate in sessions and implement lessons learned from CERTS. Approximately $120,000 was distributed to the six teams to be used as they proposed in their initial applications. Funds were budgeted for the external review of team proposals and for an external evaluator.

Evaluation

Initial team applications, self-assessments, and early workshops informed program expectations. To assess immediate effects, we completed a qualitative and quantitative evaluation at the conclusion of CERTS. An external evaluator interviewed each team and conducted focus groups with the advisory committee members. Also, online surveys were distributed to the teams and advisory committee members. Evaluation topics covered overall experiences with the program, as well as targeted questions about roles, partnership progress, NIH grant writing, and program sustainability. A planned long-term evaluation will enable CERC to determine outcomes including grant submissions and awards, continuation of partnerships, and institutional programmatic changes.

Results

Diverse team representation

The six teams invited to apply for CERTS were selected from CERC seed grant recipients and represented diverse communities and research topics:

- Evaluating healthy vending in the Chicago Park District (CBPR);
- Increasing physical activity among older African Americans (CBPR);
- Preventing depression in Latino youth (CBPR);
- Improving pediatric medication safety with parental understanding of instructions (PBR);
- Assessing parent influences on eating behaviors in early childhood (PBR);
- Using family education to lower diabetes in high-risk Latinos (CPBR; PBR).

Each team had two or three partners representing a community organization and Northwestern University academic faculty; 14 participated in CERTS activities. During the 12- to 18-month seed grant program that preceded CERTS, all teams made strong progress in research, developed partnership building skills, and demonstrated interest in advancing their CEnR careers.

Participation in CERTS

All community and academic partners of five out of six teams completed the program. The sixth team underwent community-partner staff transitions, which led to sporadic community-partner participation for that team. In spite of the uncertainty, the team's academic partners completed the program and the community organization continued to pledge support for the partnership. All six teams turned in the required assignments, which included the CERTS application, self-assessment, midproject progress report, and the final proposal draft. All six participated in the final evaluation interview and online survey. All advisory committee members provided feedback on the initial applications and midproject progress reports. In the sections below, we describe the results related to each of the premises outlined in the Introduction.

	Number
Benefits to partnership	
Plan to collaborate in the future	13
I learned a lot from my partners	11
My partnership is stronger after CERTS	11
My partner(s) added a lot—I couldn't have done it alone	10
My partner(s) and I each completed the pieces we were best suited to complete	10
I completed more work than my partner(s)	5
My partners and I divided the work equitably	2
Trust was built…	
"Among" the teams	
By getting to know each other's research projects	12
By interacting during the group feedback sessions	12
By having frequent interactions surrounding CERTS	7
Trust was not changed during CERTS	2
"Within" the teams	
By having frequent interactions surrounding CERTS	10
By interacting with other teams in the group feedback sessions	6
Trust was not changed during CERTS	3
By completing a formal agreement such as a Memorandum of Understanding	1
Other	1
Indicated plans for continuing the partnership	
Apply for local or foundation funding	11
Continue developing the research initiated through CERTS	10
Apply for NIH funding	7
Work together on programs or interventions regardless of funding	7
Apply for federal funding	3
I don't anticipate continuing on with the partnership	0

Survey completed by 14 out of 14 team members.

Table 3. Team members' report of CERTS benefits to partnership, trust building, and plans for continuing the partnership.

Collaboration increased through interaction and common assignments

Table 3 shows teams believed their partnerships benefited from CERTS. Teams had more frequent contact than they had in the past because they interacted at CERTS sessions and also worked on monthly assignments together. Regular meetings helped teams plan a cohesive research project and discuss possible funding opportunities. The process supported teams as they navigated partnership responsibilities and equitable distribution of work. One academic team partner said, "Partnership development was one of the big assets of the program and would not have happened if we were not involved with our partner. I think as I learned about the community, the community learned about the constraints of academia." Two community partners stated they were surprised to learn their academic partners also did not have

the full knowledge or experience necessary to design an NIH-level CEnR proposal and that they were on a similar learning curve. Interestingly, only two participants thought their teams had divided the work equitably. Throughout CERTS, teams constantly navigated the partnership process, division of assigned tasks, and what "equitable partnership" meant.

Trust as essential to engagement and progress

None of the academic and community partners had extensive research backgrounds and few had ever written NIH grant proposals. As described in *Table 3,* the peer-mentoring structure, along with the collaborative tone set by facilitators, created a trusting environment in which teams felt comfortable asking questions and sharing experiences. One participant explained, "It was nice to be in a group of people who all were learning, albeit at different levels." Another said, "I was embarrassed [sometimes], but everyone was in the same boat, which kept me engaged. I think if someone had been way ahead it would have been harder to stay in the group." While participants learned from each other by reviewing and critiquing each other's drafts, some questioned the ultimate value of this approach. One participant asked, "Who are we to be advising each other? I think there should be less peer mentoring and more project-specific mentoring from external experts."

Need for mentoring

In addition to trust among peers, teams expressed a desire for mentoring from faculty with senior-level research experience to provide leadership and mentoring. While the advisory committee provided guidance at the initial application and midproject progress report, a lack of experienced CEnR experts available for consultation was noted by teams. Additionally, academic partners reported wanting dedicated time and resources to access faculty development resources such as research methodology and counseling on possible career paths.

Funding was important to team participation

Five community partners and two academic partners said they would not have been able to participate in CERTS if they had not received the $20,000 grant. Four individuals (two academic and two community partners) were unsure whether they could have participated without funding. Some said the funding helped them buy out time to devote to the project. One community participant said, "Finding the time [to do research is a challenge]. I don't typically get paid to develop projects and write grants. I'm supposed to be doing [my other job responsibilities]. I was paid to do CERTS." Others stated the small time buyout helped but was not adequate for allotting enough time for research and grant writing. Teams could not spend extensive time during their workday on writing and revising proposal drafts, so they often completed CERTS assignments outside normal office hours. Time was also a barrier to taking advantage of extra offerings outside the workshops—webinars, online resources, supplemental workshops. Even with dedicated funding available, 13 of 14 participants said lack of time due to other job responsibilities was a challenge they faced between partners or as a partnership.

Structured trainings rated highly

All teams reported their partnership, research, and/or understanding of the NIH proposal process grew as a result of the program. The deadlines and organized structure of CERTS facilitated team participation and allotment of time to work on draft proposals. One participant said, "Both [partners] having other responsibilities was a challenge. However, because we knew we had time constraints, it helped us to set specific times aside for discussion between meeting times." CERTS helped teams divide writing an NIH grant proposal into manageable portions. Another participant noted, "The sessions were great. Sitting around the table exchanging papers and getting feedback [was helpful]." Teams met outside CERTS to synthesize draft feedback and plan for the next steps of writing. At the beginning, written explanations did not always reflect the depth of team projects, but the intensive practice and guided feedback on drafts clarified their communication. During the process, most groups substantially revised research questions, approach and/or design.

The interactive program elements and monthly assignments received the highest team ratings for effectiveness. *Table 3* describes participants' perceived effectiveness of CERTS components. All community partners agreed language and content of the sessions were relevant for them. Participants found advisory committee education advisors to be knowledgeable, approachable, and supportive. Almost all said they would appreciate ongoing access to support from the educational advisors.

Not ready to compete for NIH funding

During team workshop participation and staff discussions early in the program, it became evident that most teams needed more publications and experience as principal investigators to prepare competitive applications for NIH funding. A participant noted, "We would have needed to have a lot of things in place that we didn't have [to submit an NIH proposal]." In response, CERTS staff revised the final product required of CERTS teams. Instead of completing a full NIH grant proposal during CERTS, teams were asked to submit drafts of all NIH-style sections they completed by the end of the program. Curriculum topics did not change because staff felt it was useful for teams to have an understanding of what it takes to prepare a competitive NIH proposal. In addition, teams were advised to focus on publications, collecting pilot data, and seeking local funding in order to gain requisite experience.

Revised plans due to increased understanding of NIH proposal writing

All research teams reported developing a better understanding of what it takes to submit an NIH grant proposal. One academic partner expressed, "I have written many things but never understood how much of a science/tradition there is in NIH proposal crafting. CERTS really gave me insight into this." Teams learned what to address in each section, the precision required in writing, the necessity of performing a literature review, and the need to have a well-designed research question and methodology. In addition, all teams learned about the background and experience necessary to be a principal investigator on an NIH grant. Teams made plans, as detailed in *Table 3,* to build on new knowledge.

Advisory committee leadership important to development of CERTS

The advisory committee helped develop a curriculum that addressed the needs of CERTS participants during two in-person meetings and eight teleconferences. Dialog about programmatic issues was perceived to be greater at the face-to-face meetings—nearly half the advisory committee reported they preferred in-person meetings to conference calls. Participation from local CTSAs was a benefit. In the words of an advisory committee member,

"This process was consistent with the goals of C3 [Chicago Consortium for Community Engagement]. [I participated] as a way to foster research relationship across institutions, and to eliminate redundancy where we could" (*Note:* C3 is a partnership between CTSA-funded universities in Chicago). Final evaluation focus groups revealed members believed positive relationships within the committee were developed, and collaboration of expertise was beneficial to the group. Although advisory committee members worked with the same teams throughout CERTS, they felt disconnected from the teams and each other because they did not have enough personal contact to foster meaningful relationships. Several said they wished they had greater interaction with teams, but having enough time was a barrier.

Discussion

The process of developing and implementing CERTS uncovered a number of strengths, as well as gaps in preparedness, infrastructure, and resources.

Designing CERTS to be relevant for community and academic partners

To provide beneficial training topics and to respect partners' limited time, each component of CERTS was purposefully developed to guide teams to build partnership capacity and incrementally write an NIH-style proposal draft. We acknowledged CERTS was a pilot project and asked participants to suggest improvements via group discussions and session evaluations. For instance, several teams expressed needing additional time to complete drafts, so we allotted an entire month for assignments. We were especially cognizant of addressing the needs of community partners who often were less familiar with academic processes and terminology. Continuously assessing how to make presentations more accessible and relevant to community partners was integral to the planning process. Some topics, such as working with a university research office on grant budgeting, are inherently more academic-focused than community-focused. As much as possible, we added CEnR perspective to teaching materials, but at times it was challenging to locate information about NIH grant writing (e.g., budgeting and NIH proposal writing within a community-academic partnership) that specifically related to community engagement. All speakers were asked to frame their presentations for both community and academic partners. Most speakers experienced with research or federal grants were more versed in academic research, and many community presenters did not have extensive research knowledge. Community partners presented more often than academics on partnership principles. We thought resources geared toward academics might be less applicable to community partners, but CERTS demonstrated that the same skills are needed by anyone writing an NIH grant. CEnR teams, and community partners in particular, did need some specialized info (e.g., obtaining ERA commons), but many resources easily could be adapted. Similarly, we found resources were relevant for a variety of teams, regardless of whether they involved professionals from community-based organizations or from PBR networks. Although investigators within these two contexts often utilize different research approaches, they needed the same training regarding partnership building and writing NIH grant proposals.

Partnership components

In addition to learning about and preparing for the NIH grant process, teams had the opportunity to cultivate equal partnerships and troubleshoot concerns as a group during the monthly in-person workshops. Teams attending workshops together had access to the same information and could develop a common language for explaining research and thinking about the future of partnerships. While the peer-mentoring atmosphere promoted a supportive environment for teams to learn from each other's strengths and missteps, the education advisor skilled in grant writing was necessary to facilitate; no participants had appropriate expertise to guide the group. In future work that builds on CERTS, it is essential to consider how best to identify and involve additional academic and community experts who can provide mentorship tailored to each team's level of experience and perceived efficacy for developing research grant proposals.

It is interesting to note that the final evaluation showed the majority of teams did not think their team workloads were equitable. One participant in the final survey expressed that the academic partner did most of the writing and knew the grant process better than community partners. The comment acknowledges difficulties faced by teams when navigating partnership responsibilities. CERTS, however, gave teams the unique forum to address concerns. Partnership building was featured in early learning sessions, but largely was realized through team interaction. For example, the group learned an important lesson at the midpoint of CERTS, when several community partners expressed they were overwhelmed by CERTS expectations. They felt challenged to participate in the research design and application-writing process because the activities were unrelated to regular job responsibilities that did not include protected research time. They acknowledged an equitable partnership does not require partners to perform the same duties. Instead, they concluded that collaboration can be equitable if there is open discussion and agreement about the roles of each of the partners. After the session, a community partner reported feeling relieved and more confident in what she could offer to the partnership.

For other institutions considering team training, we think it could be beneficial to engage teams in setting partnership expectations throughout the program. A shared vision/mission document could be part of the program application or homework, helping clarify expectations upfront and leading to fewer misunderstandings among community partners later in the trainings. Teams, however, need to know each other and their research goals very well in order for the initial planning process to be effective.

Need for research methods training and time

CERTS intentionally did not teach research methods because the timeframe was too short. We assumed teams would be working on fully conceptualized research projects, and methodology resources were available elsewhere. However, we found some teams were still in early planning phases or needed guidance to move forward. A participant explained, "We needed more time and more realistic goals for our project. It would be good to have more help in project development before going into detail as to the NIH grant writing process." Changes to research questions were made as feedback was received—this is a common process during early proposal writing because guidance cannot be offered until sufficient project details are described.

It became evident that designing studies was a challenge because research is not the primary activity or focus for some CERTS teams. This fact presents a challenge for participation in CEnR in general and NIH-level research in particular. The majority of faculty partners had more experience than community

Lesson learned	Plans to incorporate CERTS lessons into Northwestern activities
Team collaboration increases through interaction and proposal preparation	• Provide joint capacity-building activities for community and academic partners (e.g., workshops, consultation, mentoring sessions)
Collaboration with academic and community institutions is beneficial to program development	• Continue to participate in multi-institutional networks (e.g., Chicago Consortium for Community Engagement and the Chicago Practice-Based Research Collaborative) • Continue to engage partners from academic and community institutions in project advisory boards
Teams benefit from mentor-led peer-group interactions	• Incorporate experienced mentors in capacity-building programs • Provide opportunities for peer teams to form relationships and model ways to provide constructive feedback
Teams benefit from funding to support education and proposal preparation	• Provide funding to partners to support time to participate in capacity building • Provide seed grants/funding to: - Assist with pilot projects and proposal preparation efforts - Convey legitimacy of community-engaged research to superiors - Hold teams accountable for project completion
Teams have difficulty finding adequate time for research activities	• When possible, include funding mechanisms that buy out time • Offer workshops/activities at convenient times • Ensure project requirements move teams toward research goals (e.g., requiring document drafts rather than progress reports) • Provide information tailored to team needs
Some teams need additional training in research methods	• Explore options with other university entities to develop targeted training opportunities
Teams need additional journal publications	• Provide small grants to assist faculty/teams in preparing journal articles • Hold writing retreats (i.e., provide space, food, and technical assistance) • Contract with experienced journal reviewers to consult on issues related to article preparation • Institute writing program similar to CERTS (e.g., small grants, workshops, and mentor-peer review of drafted pieces)
Teams need to seek smaller grants before applying for NIH funding	• Support teams to identify private and nonfederal funding sources
Teams seldom watched webinars	• Focus on providing interactive capacity-building programming Ensure potential benefit of programming is clear and immediate
Academic partners need additional senior-level mentors	• Include senior-level faculty in future capacity-building programs • Provide connections to senior faculty for one-on-one mentorship • Provide opportunities for consultation with visiting senior faculty • Recruit senior faculty with community-engaged research experience • Support junior faculty with career development and mentoring skills training
Academic partners need more experience as principal investigators for research grants	• Provide funding through seed grants to conduct small projects • Provide assistance with locating small foundation sources of funding • Pursue opportunities to increase faculty development fellowships (e.g., KL2) and create designated slots for community-engaged scholars
Academic partners need support for a variety of research career aspirations	• Support faculty at the level they need, from applying to foundation funding to seeking NIH funding • Acknowledge not all faculty will seek to become NIH-level researchers or PIs
Community partners need experience to be viewed as credible investigators	• Provide opportunities (e.g., seed grant projects) for community partners to play active roles in small projects that help build experience (e.g., managing funds and producing deliverables on a time line)

Table 4. Plans to incorporate CERTS lessons learned into Northwestern activities.

partners but still needed direction. Some had appointments in departments without a research focus. Academics who perform CEnR may not have the advantage of receiving methodological training and discussing research challenges and successes with colleagues on a daily basis. CEnR includes approaches that are newer and less developed than those used in nonengaged research so there may be less institutional understanding of CEnR, creating a barrier for peer support and mentoring. Additionally, any academic who does not perform research as a primary job responsibility could face similar obstacles when trying to obtain research support. Faculty development opportunities for methodology training would benefit any academic pursuing research. Translational sciences institutes provide research degrees and services, but it is possible CEnR practitioners would benefit more from methodological and design consultation specific to their projects. Also, CEnR researchers must have dedicated time in order to access the resources.

Regimented academic schedules in the classroom or clinic contribute to lack of time to dedicate to research grant writing. Similarly, community partners who work in busy nonprofit organizations or clinical practices have limited time and access to research resources. Even though they were enthusiastic about CEnR, CERTS teams reported not having enough time for research was an ongoing issue. Addressing the need for dedicated funding and time was an important component of CERTS. CERTS funding allowed teams to attend monthly workshops but was not enough to buy out sufficient writing or research time. Long-term evaluation will ascertain if CERTS teams will be able to find time, with or without funding or other forms of direct support, to sustain the projects and partnerships they have initiated.

Moreover, we hope ongoing evaluation of pragmatic attempts to address partnership needs within the scope of limited resources will identify best practices to improve initiatives like CERTS in the future.

Adapting the CERTS model

The conventional NIH grant writing model of a burgeoning researcher working closely with a designated mentor was approached differently by CERTS. The CERTS model was novel because it focused on teams as a whole rather than on academic or community researchers separately. Testing a pilot program for CEnR teams rather than for individual researchers was an effective exercise in increasing partnership capacity and participant progress toward writing a research funding proposal. Although the goal shifted away from completing a full NIH grant proposal, the iterative process of writing sections of NIH proposal drafts in a dynamic group environment forced teams to rework research questions, write out proposal sections, and think about the future of their partnerships in a controlled setting with finite time. The CERTS curriculum could be replicated at institutions where CEnR teams are ready to apply for NIH funding, but we found teams need more preliminary supports. We are incorporating lessons learned into our regular programming to increase research capacity and opportunities for teams at any level. The lessons learned through CERTS can be sustained in a number of ways; *Table 4* summarizes the goals we have set for adapting our activities to better support community-academic research teams.

A program that prepares teams to apply for NIH funding is not for every CEnR team. However, such a curriculum does provide effective architecture for helping teams develop research ideas and learning how to express them. If a non-NIH grant structure were targeted, it still would need the clarity of purpose offered by the NIH style. CERTS components could be administered separately and with intensive support so teams may take advantage when they are ready. For example, if teams need to develop a research project, they can be advised to gather pilot data and publish results before they utilize CERTS resources. Others might be ready to identify an NIH funding opportunity and, with support, begin writing a grant proposal. A checklist could be created to help teams learn about NIH funding and identify possible career tracks. CEnR investigators, and to a lesser extent teams, need to decide whether pursuing NIH funding is a career goal because interested individuals must make continuous choices that will funnel them into a long-term NIH research career. Securing leadership with high-level research experience and modifying the program to accommodate research teams at different stages, such as those applying for other federal or foundation funding, could begin to fill the need for CEnR team training. A key lesson learned was the importance of helping teams target smaller funding sources to support research interests. For some, especially those unlikely to reach NIH funding—or for those uninterested in pursuing NIH funding—this level of support will be sufficient for making significant research contributions.

Conclusion

The process of developing and implementing CERTS highlighted the shared experiences of community-academic teams and underscored the need for appropriate training, infrastructure, and dedicated time to increase capacity for research focused on improving community health. Supporting CEnR teams with prior experience ranging from early pilot projects to NIH-funded studies requires varying approaches and areas of expertise. CEnR research may be strengthened by providing resources needed by CEnR teams such as seed grants, mentorship, and other programming that help teams achieve their goals. CERTS findings highlighted the growing pains of a CEnR approach to solving community health problems, and lessons learned can inform institutional programming and stimulate thinking about CEnR goals. As the field of CEnR grows and matures, more mentors will emerge and best practices will become evident. The question remains whether efforts such as CERTS can accelerate the evolution.

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