

# Community-Engaged Scholarship for Graduate Students: Insights from the CREATE Scholars Program

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## Abstract

We describe an extracurricular graduate fellowship program designed to train students in community-engaged scholarship with Black and Indigenous communities. The CREATE Scholars program combines coursework, research externships, and experiential learning opportunities in order to develop graduate student competencies in codevelopment, community engagement, and scholar-advocacy. We offer reflections on lessons learned from the perspective of students and faculty in the program. We conclude with recommendations for like-minded academic leaders and program directors seeking to expand opportunities for graduate students to engage in reciprocal and thoughtful community partnerships.

*Keywords: graduate education, community engagement, outreach, university, cohort programs, interdisciplinary*

Graduate education is not only a pathway for career advancement, but also a critical time for developing one's identity as a scholar (Day et al., 2012). Growing societal attention to issues of inequality, climate change, and racial justice have only enhanced student desires to better connect their professional development with urgent environmental and social challenges. Whether pursuing careers as faculty or in another sector, today's graduate students seek training that will prepare them to solve complex societal challenges (Garibay & Vincent, 2018). Graduate students need opportunities to participate in interdisciplinary and engaged models of scholarship that align with their values, help form their identities as scholar-advocates, and enable contributions to long-term societal change (O'Meara, 2008).

Graduate programs face increasing pressure to decolonize systems of knowledge production; challenge conventional academic norms and incentive structures; and promote diversity, equity, and inclusion in the academy (Davies et al., 2021; Keeler et

al., 2017; Parker et al., 2018). At the same time, universities risk perpetuating harmful power relationships and falling short in developing sustainable solutions unless they critically appraise their engaged scholarship and community-based learning programs, emphasizing the importance of sharing these programs' challenges and successes (Jaeger et al., 2011; Peterson, 2009).

Unfortunately, the traditional model of graduate school training has not evolved to meet the changing desires of students. Graduate programming remains largely individual and disciplinary, as opposed to team-based, transdisciplinary, and externally engaged (Sandmann et al., 2008). Doctoral programs rarely include instruction in vital professional skills such as organization and outreach, public engagement, leadership, and cooperative problem-solving. As a result, graduate students lack access to the mentorship and professional development opportunities that are needed to effectively translate their knowledge and skills to applied problems (Campbell et al., 2005; Nerad, 2004; Sandmann et al., 2008). Although outreach and service are

frequently integrated, these activities are typically one-way approaches to delivering knowledge and skills, rather than focusing on the two-way process of engagement with external partners that leads to mutually beneficial outcomes with greater sustained impacts (Weerts & Sandmann, 2010). Students report feeling frustrated by the lack of opportunities to conduct interdisciplinary research and expand their training beyond the academy (Jacob, 2015; O'Meara, 2008). In response, new models of graduate education are emerging to facilitate interdisciplinary and community-engaged research opportunities for students (Andrade et al., 2014; Matthews et al., 2015).

The purpose of this article is to describe one model for a graduate training program that provides students the opportunity to work in interdisciplinary teams on community-defined problems related to social and environmental justice. The CREATE Scholars program is unique among interdisciplinary graduate training programs in that our engagement efforts prioritize bidirectional community collaboration with historically marginalized Black and Indigenous communities. External collaborations can take many forms. However, historical inequities, power imbalances, and resource constraints make university partnerships with traditionally underresourced communities unique and deserving of special consideration and training (Lum & Jacob, 2012; O'Meara, 2008). Our approach to curriculum development and identification of community partners is grounded in an analysis of structural racism and the role of institutions in higher education in perpetuating systems of inequality. Building on the framework of "resourcefulness" developed by MacKinnon and Derickson (2013) and elaborated by Derickson and Routledge (2015), CREATE aims to reorient the research university toward relationships of accountability and to mobilize its resources to ask and answer questions that are a priority to partners who have not historically shaped institutional research agendas. In this sense it is distinct from some approaches to community engagement that do not explicitly prioritize working with and resourcing historically marginalized groups. We summarize insights from our experience as leaders and participants in the program in an effort to stimulate a conversation about how institutions can adapt or build on our approach or combine elements of our model with existing or proposed graduate programs.

## **Codeveloping Research and Engaged Approaches to Transform Environments: The CREATE Scholars Program**

### **Recruitment**

The CREATE Scholars program serves University of Minnesota graduate students interested in community-engaged and interdisciplinary research at the intersection of environmental justice and racial equity. We selected students for acceptance into the program based on their stated and demonstrated motivation to codevelop research questions with community partners, work as part of interdisciplinary teams, and refine their approach to scholar-advocacy. The focus was on training students who sought to grow in these areas but lacked access to the funding and mentorship to work with community members through their disciplinary departments. In this way, the CREATE Scholars program fills a known skills development gap in conventional graduate training programs (Day et al., 2012; Sandmann et al., 2008).

We recruited students from over nine colleges, including engineering, geography, chemistry, psychology, educational leadership, communications studies, and public policy. Many students had no prior experience with environmental or social justice research. A common theme in applications was a desire to "directly address challenges facing communities," "collaborate with members from multiple academic disciplines," and "learn to effectively unite diverse academic perspectives in order to conduct impactful interdisciplinary research." This statement from a scholar application aptly summarizes student motivation for participation in the program:

I am applying for the CREATE scholarship because it values the leadership of communities impacted by environmental injustices, while also empowering scholars to identify their skills to use in solidarity with those communities. Potentially my strongest interest in the CREATE scholarship is its emphasis on products that will be legible and useful to the communities it serves.

### Program Design

The 12-month program included a one-credit spring semester practicum course, paid 8-week summer externship, and a fall semester reflection period (Figure 1). Students also participated in retreats, community-building activities, and skills workshops. Funding for the program covered 8-week summer research assistantships for all scholars, half-time salary for a program coordinator, and summer salary for faculty instructors, for a total cost of approximately \$150,000 annually. Available funding allowed us to run the program for 2 years, serving cohorts of 11 scholars during the 2019 program year and 12 scholars during 2020.

The program began with a mandatory one-credit practicum course designed to build a shared sense of community, develop skills needed to be effective community-engaged researchers, and raise awareness of the issues and priorities of community partners. The curriculum included a book discussion on race using the texts *So You Want to Talk About Race* by Ijoma Oluo (2019 cohort) and *How to Be an Anti-Racist* by Ibram X. Kendi (2020 cohort). Course instructors used these texts and associated resources, not as comprehensive treatments of the experiences of marginalized communities, but rather as entry points to conversations about the problematic legacies of university research, researcher positionality, and the dynamics of power and privilege as they intersected

with academic partnerships. Creating a space that was intentionally nondisciplinary, nongraded, and noncompliant with traditional university norms encouraged feelings of psychological safety and shared vulnerability that supported scholar growth.

The remaining curriculum was designed to prepare students to engage with community partners in the process of research codevelopment. Class discussions covered best practices for team-based interdisciplinary scholarship, scholar advocacy, models of healthy university-community partnerships, and techniques for building respectful relationships. CREATE scholars were instructed in these models before meeting with their respective community groups. Faculty and staff mentored scholars in expectations for community engagement, including how to write an introductory email to a partner, strategies and agendas for one-on-one meetings, and norms and expectations for “closing” a relationship. Training in these soft skills of relationship-building was a required part of the fellowship, and hard skills workshops in data analysis, qualitative methods, story mapping, and facilitation were offered as optional activities based on student interests.

### Community Involvement

Community partners were recruited from the existing members of the CREATE Initiative’s Policy Think Tank (<https://create.umn.edu/>)

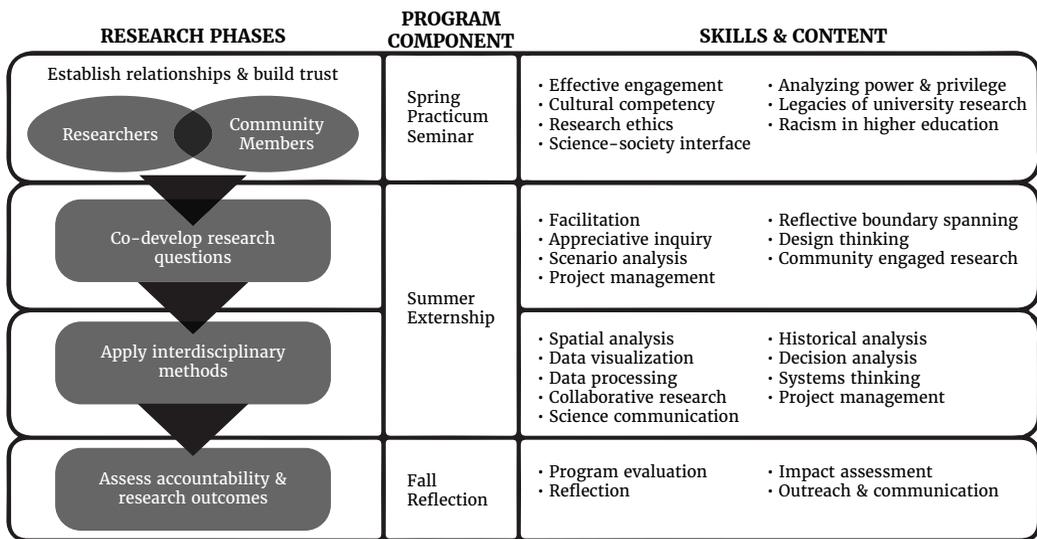


Figure 1. The CREATE Scholars Program Design Schematic With Key Competencies

Note. The program consisted of three components that mapped onto key training objectives and skill areas designed to guide students toward competency in community engagement and codevelopment.

[our-team](#)). Think Tank members are organizational leaders and advocates who represent Black and Indigenous communities in Minneapolis, Minnesota; Atlanta, Georgia; and North Florida. A common theme among all community partners was an interest in environmental justice and the relationships between racialized exclusion and the natural environment. Relationships with community partners can take years to develop, which often constitutes a stumbling block to incorporating students in community engagement. The CREATE Scholars program relied on the consistency and credibility of existing faculty relationships with the Policy Think Tank, which enabled students to enter into these relationships for a summer rather than having to develop and carry the relationship forward over time. By institutionalizing key relationships with community partners, the Think Tank model takes the onus off graduate students to form their own “new” relationships and allows faculty to deliver valuable research to community partners over multiple years. Observing how faculty sustain engagement with community partners is also instructive for students, allowing them to appreciate how to adapt principles and models of community engagement to meet the needs of a range of organizations (Weerts & Sandmann, 2010).

Students were grouped into teams to construct draft work plans to be presented to community partners based on community-articulated needs. The process of triangulating community priorities with the skills and resources of scholars was one of the challenges faced in the implementation of this program. Some community partners had specific tasks in mind; however, many were less clear on how student teams could be helpful. Faculty mentored students through the process of codevelopment, noting that external partners shouldn’t be expected to know how academic researchers can be helpful and suggesting ways to “bring something to the table” while also being open to iteration, continuous feedback, and flexibility.

### Outcomes

Products from the student externships included ArcGIS StoryMaps documenting the environmental histories of urban watersheds, training and resources for integrating Dakota culture and history into a sixth grade social studies curriculum, grant

writing for climate adaptation initiatives on behalf of communities, and quantitative analysis of gentrification risks associated with urban park investments. All products from the student externships can be viewed on the CREATE Initiative website (<https://create.umn.edu>), along with reflective blog posts written by scholars at the conclusion of their externships. Students and community projects were featured in a culminating public event at the university, where community mentors participated as panelists and shared their reflections on effective academic–community partnerships.

The COVID-19 pandemic and Minneapolis uprisings of 2020 required adjustments to the externship experience for our 2020 cohort. Collaborations with community partners were conducted solely online, and some research projects pivoted to focus on emerging needs of communities in the aftermath of the murder of George Floyd. For example, one group developed a StoryMap on gentrification in a neighborhood impacted by property damage during the uprising with the understanding that unfolding events added a new layer of complication to long-standing community concerns. Heightened community needs resulting from the pandemic and uprising required increased sensitivity to time requested of community partners. In several cases, research or data was not nearly as urgent as hands to help distribute food or meet material needs. This forced the students and faculty to reflect on the limits of what a university–community partnership can offer, especially during times of crisis. Despite these challenges, students and partners were able to adapt to online platforms for engagement and still produce valuable products for communities.

### Reflections

As faculty leaders and student participants in the CREATE Initiative, we had frequent discussions about the impact of the scholars program and how the experience differed from the graduate programming in the home department of each scholar. Reflection activities were built into the program and continued via informal conversations with CREATE staff, faculty, and scholars. Here we summarize three insights that were coarticulated by scholars and faculty that may have salience for other programs with overlapping aims.

### **An Emphasis on Resourcefulness**

Our program adopted a model of “resourcefulness” to guide our approach to engaging and collaborating with community organizations (MacKinnon & Derickson, 2013). Grassroots organizations and low-income communities, although holders of local expertise and relationships, are materially underresourced relative to universities. This distribution of resources has implications for the kinds of knowledge products communities are able to develop as well as their capacity to engage with researchers. When community organizations or initiatives do have paid staff, they are often pulled in many directions and have to juggle a mix of responsibilities. Community members who want to participate in research activities may likewise face barriers, such as lack of transportation or child care. The value of resourcefulness directs academics to take a holistic appraisal of the resources universities can offer a partner organization or group in order to enable them to fully participate in shared activities.

For students, the practice of resourcefulness means centering the needs of the partner organization and thinking about how student actions, time, and capacity can *resource* their community partners. Students have access to high-speed internet, university libraries, meeting spaces, large-scale printers, GIS software, and research and IT staff, resources that are often unavailable to community organizations. Simply connecting these amenities and resources with communities via student externships can offer tremendous value to external partners who do not typically have access to teams of consultants and in-house research support. We encouraged students to think about the barriers partners faced and how they could alleviate them through their work. Resourcefulness also means that activities and planning unfold at a pace that aligns with the organization’s capacity and needs, instead of the students’ academic calendars. At an institutional level, the CREATE Initiative worked to materially resource partners by providing a stipend to either compensate them for their time or provide funding to their organization.

### **Rethinking What Counts as Knowledge Products**

Graduate students are trained to produce journal articles, book chapters, or lectures that speak to disciplinary audiences and ad-

dress knowledge gaps defined by other academics. In contrast, the knowledge products desired by communities take such forms as fact sheets, training modules, maps, and videos. Although community-facing knowledge products differ in form from conventional knowledge products, graduate students are well positioned to contribute to the production of these materials. Students leveraged their graduate training to track down information, synthesize insights from research, work with varied datasets, and quickly and efficiently gain new knowledge. CREATE Scholars conducted informal interviews, established websites for community partners, created maps, and developed presentation materials for organizations.

For one CREATE Scholar, products took the form of informational handouts that community partners could use at public events. For another student, creating a StoryMap required careful listening and following the lead of the partner on their vision for an accurate, respectful, and culturally meaningful representation of their community. Community-facing products also required clear and effective written communication, allowing scholars to practice a skill central to academic training regardless of discipline. Navigating these alternative knowledge products was not always easy for scholars, as there was sometimes a perceived conflict between the high standards of evidence typically associated with peer-reviewed academic products and the less precise, but more responsive, research that can address an immediate community need.

### **Process Is the Product**

By design, externship programs are temporary, and the short time frame can create a hyperfocus on efficiency and product completion. In our program, we were intentional about pushing back on this tendency, encouraging students to focus on “process over products.” The program leadership did not expect final reports or research products. Instead, we defined success as showing up, listening, and adopting a “willingness to be transformed” by the engagement. Being a responsive, and resourceful partner was more important than the creation of a specific research project. As noted above, scholars were encouraged to think broadly about their skills and capabilities, which meant that sometimes the most valued and helpful contributions were in the form of providing rides, setting up a

meeting, making phone calls, or delivering food for a workshop. Centering the relationship, rather than a research transaction, was a key insight from the program and required cultivation of a different set of skills and self-awareness of positionality and privilege. We also encouraged conversation about the tradeoffs between conventional norms of scholarly excellence and the products of community engagement. Students in the CREATE program were still held to the disciplinary standards of their home departments and therefore needed to think creatively about how to balance their time doing work that was valued by communities while also making progress toward their thesis or dissertation.

A focus on process also encouraged students to reflect on their own approach to advocacy and scholarship. Guest speakers from the community and professional mentors from within the academy shared their personal experiences with advocacy and research and how it shaped their work. The knowledge products codeveloped with community partners often had a political goal, such as preventing land loss from development, building collective knowledge about community history, or raising awareness about and galvanizing resistance to green gentrification. Over the course of the program, we discussed how to reconcile personal values and commitments with the norms and expectations of academic research. We also discussed concepts of objectivity and legitimacy and how adherence to scientific integrity (as defined by Western systems of knowledge production) can come into conflict with the lived experiences of community members (Eigenbrode et al., 2007). These conversations were not intended to promote a “best” way of conducting community-engaged scholarship; the goal was rather to encourage self-reflection on these topics and explore diverse models of scholar-advocacy.

## Evaluation

### Preprogram Research and Development

We hired a graduate student with experience in assessment to help design an evaluation strategy for the CREATE Scholars program. Before beginning the program, we held listening sessions open to all graduate students at the university to provide feedback on their desires for extracurricular graduate training. We also reviewed relevant

literature on community-engaged scholarship and identified model programs at other institutions. We distributed an online survey to all participants in our listening sessions to summarize their preferences for skills to be included in future graduate programming (Figure 2). Insights from the focus groups and survey identified “cultural competency,” “project management,” and “working effectively in interdisciplinary teams” as the most important skills students sought from a new graduate program.

### Participant Program Evaluation

In collaboration with our assessment specialist, we developed a web-based survey for admitted scholars to assess how our learning objectives mapped onto student experiences. We administered the survey three times to the 2019 cohort: precourse, midcourse, and end course. In addition, we hired one student to complete three separate hour-long focus groups with 2019 scholars at the end of their fellowship. Our program evaluation focused on the 2019 cohort because we wanted the assessment to inform the design of the 2020 cohort experience. Results of the scholar survey are presented in Table 1. The number of observations is small, precluding any claims about significance. However, the trends point to a notable increase from precourse to end course in the number of “agree or strongly agree” responses to the statements “I feel equipped with strong interpersonal skills to effectively engage in participatory research with community stakeholders” and “I feel culturally competent enough to work with minority communities” (Table 1).

The focus groups with scholars upon completion of the program identified an increased interest in community-engaged research. Several students stated that the CREATE Scholars program informed their future research and work plans and motivated them to use a community engagement lens in their own work, something many of them had not considered before. A number of participants commented that the class offered diverse perspectives compared to other coursework and an opportunity for more experiential learning. Scholars also noted that the focus on personal transformation and the cultivation of soft skills was just as valued as professional development and refinement of hard skills.

Our limited evaluation suggests that the program achieved its goals related to in-

Current Graduate Students,  $n = 37$ 

### Mean Skill Importance Rating (1 = Not at all important, 5 = Extremely important)

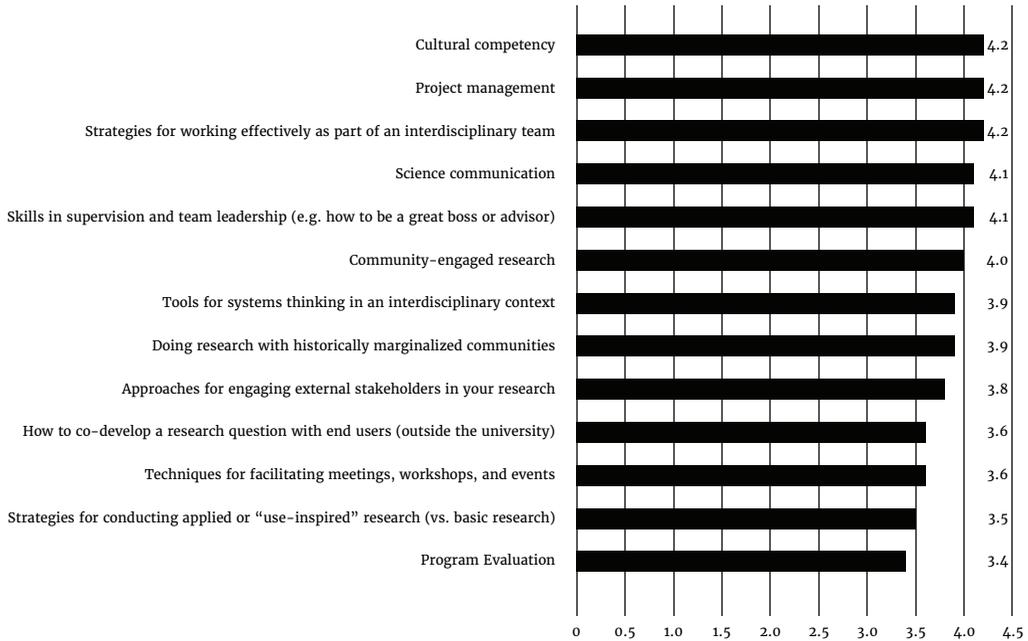


Figure 2. Survey Responses Regarding Skills for Future Graduate Programming

Note. Results of an online survey administered in 2018 to graduate students who attended listening sessions related to the design of the CREATE Scholars program (37 unique responses). Mean responses to each prompt reflect student preferences for a list of potential skills and objectives of a hypothetical graduate training program, with 1 = *not at all important* and 5 = *extremely important*.

creased cultural competency, increased comfort with interdisciplinary collaborations, and increased interest in conducting community-engaged research.

We did not conduct any formal evaluation of community partners' perceptions of the CREATE Scholars program because the program's conclusion coincided with the ongoing COVID-19 pandemic and the Minneapolis uprisings of the summer of 2020. We did not feel it was appropriate to ask partners to complete surveys or respond to focus groups while they were struggling to respond to the basic needs of their communities. Informally, we have received positive feedback from our partners. Since the conclusion of the project, members of the Policy Think Tank have served as resident scholars at the university, given guest lectures in classes, provided mentorship and networking for CREATE scholars, and continued to communicate and collaborate with CREATE faculty. Although funding for the scholars program has ended, we have been able to leverage research funding from other grants to continue our relationships with

the Policy Think Tank. Our intention is to continue to nurture these partnerships, involve individual students when appropriate, and seek funding to support future student cohorts.

### Recommendations

We offer the following recommendations to institutional leaders and faculty seeking to develop graduate-level programming or coursework in community engagement.

#### Faculty Must Sustain Relationships

The success of the CREATE Scholars program depended on building and maintaining relationships with community partners whose needs often shifted in response to changing social and political dynamics. These relationships require attention and maintenance to foster trust and position academic partners to respond appropriately and effectively. As we attempted to scale up the number of relationships we had with local partners, we hired full-time staff to serve as community-facing representa-

**Table 1. Survey Responses Regarding Achievement of Learning Objectives**

<b>2019 Scholars Cohort</b>			
	<b>Pre-Course</b>	<b>Mid-Course</b>	<b>End-Course</b>
	February 1-5, 2019 <i>n</i> =11	March 25-26, 2019 <i>n</i> =8	December 26-31, 2019 <i>n</i> =5
1. I feel equipped to collaborate with my peers who come from different academic training.	3.9	3.9	4.6
2. I feel equipped with strong project management skills needed to complete different class and externship tasks.	4.0	4.5	4.0
3. I feel equipped with strong interpersonal skills to effectively engage in participatory research with community stakeholders.	3.5	4.0	4.6
4. I feel equipped with strong communication skills to explain my research ideas succinctly to a non-academic audience.	3.3	4.0	4.0
5. I can apply appreciative inquiry to understand community needs.	3.3	4.1	3.8
6. I feel equipped with strong leadership skills to work independently.	4.6	4.6	4.4
7. I feel equipped with cultural competency and how it might affect community engagement.	3.5	4.0	4.4
8. I understand the intersection of social justice and gentrification.	3.5	4.3	4.8
9. I feel culturally competent enough to work with minority communities.	3.5	3.9	4.4

1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, 5=strongly agree

*Note.* Mean student responses to each of nine prompts included in precourse, midcourse, and end course survey assessments (2019 cohort). We distributed the survey to all 11 scholars in the 2019 cohort. Number of observations reflects declining response rate over the course of the three surveys.

tives to service the partnerships and liaise between faculty, students, and community partners. Our experience suggests that in practice, it is very difficult to “off-source” these partnerships to staff, and the work is both more successful and more effective when faculty members themselves hold the relationships with community partners.

### Make Funding Flexible

Traditional funding structures and strict adherence to predetermined budgets make it challenging to shift research directions in response to community-articulated needs. As a result, most sponsored research projects limit researchers’ ability to enter into genuine codevelopment partnerships with community members. Resourcing partners often requires nontraditional purchases like gift cards, community stipends, bus tickets, parking passes, and hospitality expenses. Filing expense reimbursements for these items can hit bureaucratic barriers that make it challenging to use university funds to support the basic activities of effective engagement.

We recommend that granting organizations reform structures that make it difficult to shift objectives and adapt to changing community needs. In addition, universities can create reimbursement policies or dedicated funds that facilitate the transfer of resources to external partners. Our work benefited from the flexibility of an internal grant that allowed us to rebudget how funds were allocated as the needs and priorities of our partners changed.

### Reward Student Engagement

Addressing community needs lacks the “academic profitability” of creating a high-impact-factor publication. Scholars were not guaranteed to emerge from their fellowship with CV-worthy products, academic papers, or proprietary datasets. We mentored students in how to translate their experiences as CREATE Scholars into future applications and career opportunities, including highlighting skills in engagement, public communication, facilitation, conflict resolution, and project management. Students were encouraged to list nontraditional products on their academic CVs and include links to blog posts and StoryMaps as evidence of their experience with codevelopment and interdisciplinary, team-based research. Documenting and highlighting these nontraditional products is a start, but

our experience supports growing calls for revisions to the incentives and metrics used to evaluate and reward academic success; for example, through adopting a broader and more inclusive consideration of academic impact (Davies et al., 2021; Koliba, 2007).

## Conclusions

The key ingredients of our graduate program—codevelopment, interdisciplinarity, community building, and external engagement—are not necessarily new or unique in graduate curricula. The rise of community-based participatory research, engagement initiatives, and training on codevelopment illustrate that universities are taking seriously the need to create pathways for students, faculty, and researchers to collaborate with external partners (Arble & Moberg, 2006; Jagosh et al., 2015). Our program is unique in that our engagement was intentionally oriented toward the needs of historically marginalized or underresourced communities. These communities have experienced decades of exploitation by researchers and have been denied access to resources and opportunities by the universities in their backyards (Lee & Ahtone, 2020). As a result, Black and Indigenous communities have justifiable skepticism about collaborations with academics. We also acknowledge that our program focused on a limited number of community partners whose experiences are not necessarily representative of the concerns of other Black or Indigenous communities. We encouraged students to reflect on whose voices were not represented in CREATE-mediated relationships and how collaborations with different partners require additional reflection, historical analysis, and interpretation.

Programs that aim to address this gap must start with an awareness of the problematic legacy of the academy and historical patterns of colonization and disenfranchisement. Our program devoted significant time to self-reflection, cultural awareness, and historical context before engaging community partners. When we did engage, it was under the explicit goal of identifying ways that the resources of a research university could be leveraged in service to community concerns. This distinction is key and reverses the traditional disciplinary model of developing questions and then identifying communities where researchers can test those questions to create knowledge prod-

ucts that are recognized by the academy.

In addition to technical knowledge and expertise, students were trained to build relationships rooted in empathy, ethicality, and accountability (Sprain & Timpson, 2012). A focus on the “habits of responsible participation” and exposing students to contrasting knowledge paradigms and worldviews helped build trust with the community, generate ideas from diverse viewpoints, and improve chances of translating knowledge to action (Beier et al., 2017; Klein, 2014; Liberatore & Funtowicz, 2003; Mattor et al., 2014). Particularly for students of color, engaging with culturally diverse, non-Westernized ways of knowing can be validating and motivating (Banks & Dohy, 2019; Davies et al., 2021).

It is challenging to develop and implement new approaches to graduate training—especially ones that run counter to traditional funding schemes and reward systems, re-

quire high faculty involvement over multiple years, and then may not be recognized in tenure review (Koliba, 2007). However, the payoffs for these efforts can be significant, as evidenced by the student, faculty, and community partnerships fostered by the CREATE Initiative (Derickson et al., 2021; Ehrman-Solberg et al., 2020). In our experience, many of the best and brightest students seek these opportunities. In order to stay competitive, institutions of higher education will face increasing pressure to develop programming that prioritizes interdisciplinarity and external engagement, especially around themes of racial justice, sustainable development, and environmental change. These opportunities are essential not only for creating the next generation of societal leaders, but also to ensure our universities are fulfilling their social contract to produce future leaders capable of addressing these challenges (Lubchenco, 1998).



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