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Coming to America and Helping Communities: Stories from Women in Academia

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Abstract

This research explored the question: what are the experiences with community engaged research among foreign-born women academics in STEM. The work draws attention to the benefits of immigration in bringing individuals who make important societal contributions, including by helping marginalized communities in the U.S. and beyond. Previous research has documented that civic engagement helps immigrants integrate into their new country and fight discrimination. In the current research, which is embedded within a larger study, interviews were conducted with 13 women with doctoral degrees in STEM. All five of the women born outside of the U.S. discussed their community engaged research. Having a background in at least two cultures provides these women with skills in discerning cultural nuances in different community settings. This cultural sensitivity is an important skill when engaging in partnerships with communities. Some of the foreign-born academics also possessed socioeconomic backgrounds that allowed them to readily empathize with marginalized groups in the U.S. The research achievements of these women made positive contributions to the health, safety, and welfare of local communities near their university and other communities in the U.S. and abroad. Stories of these successes and some of their challenges are shared in the paper.

Introduction

Higher education in the United States is expected to yield benefits to society, justifying the investment of public funds. Finkelstein et al. [1] describe this as a "unique American tradition [of] service and engagement with the greater society." The scholarship of engagement in Boyer's model [2] aligns with this mission. Community engagement can take a variety of forms, including integration into classroom teaching (e.g., service-learning), mentoring co-curricular activities (e.g., learning through service), outreach (often into K-12 schools and via public information), and research. Community engaged research (CER) is defined as "the collaborative generation, refinement, conservation, and exchange of **reciprocally beneficial** and societally relevant **knowledge** that is generated in collaboration with, communicated to, and validated by peers in **academe and the community**" [3, p. 6]. Another definition of CER is "research conducted via meaningful **collaboration** among scientists and nonscientists, that explicitly recognizes that scientific expertise alone is not always sufficient to pose effective research questions, enable new discoveries, and rapidly translate scientific discoveries to address society's grand challenges" [4, p. 4]. While academic training in engineering ensures preparation to execute high quality research, education on the principles and practices of community engagement (e.g., [5]) are less common. CER is a sub-set of more broadly defined community-engaged scholarship.

Recently, U.S. federal grant monies were being directed to CER from agencies including the Environmental Protection Agency [6],[7] and the National Institutes of Health [8]. There are challenges in ensuring that these investments truly benefit communities given that "funding decisions often prioritize research outcomes and academic teams over the community… potentially hindering the sustainability and effectiveness of collaborative efforts" [9, p. S348].

There is also evidence that CER is not always advantageous to the academic careers of the faculty participating in this work [10],[11],[12]. STEM (science, technology, engineering, and mathematics) fields in particular may grapple with these issues given their tradition that narrowly defines expertise and preferences objective and replicable fundamental research. Evidence suggests that women faculty and individuals from minoritized groups conduct CER more often than other demographic groups [13]. A convergence of discrimination of women and minorities with undervaluing of CER may be particularly detrimental to their promotion and tenure in STEM fields in academia [14],[15],[16].

A large percentage of academics in STEM in the U.S. are international scholars, including tenured/tenure-track faculty, post-doctoral scholars, and research professors. According to the U.S. National Science Foundation (NSF) [17], "in academia, just about half (49%) of U.S.-trained postdocs were born overseas, as are 29% of full-time [science and engineering] faculty." In a case study at MIT, 43% of all 1125 tenured and tenure-track faculty were born outside of the U.S. [18]. Oka et al. [19] reported that engineering doctoral degrees in the U.S. were primarily awarded to foreign-born men (43%), followed by U.S. born men (33%), U.S. born women (13%), and foreign-born women (11%). The NSF [17] also reported that about 60% of workers with doctorate degrees in engineering, math, and computer science were foreign-born. The intersectionality of racial/ethnic groups with international status is important to acknowledge; Arellano et al. [20] reported that in 2016 among 600 Latino engineering faculty only 48 were born in the U.S. These numbers illustrate the importance of understanding the role and experience of international / foreign scholars in academia in the U.S.

Terminology and classification when studying the experiences of international scholars varies. The classification based on country of birth (e.g., foreign-born faculty, FBF) is overly simplistic. An individual can be foreign-born but raised in the U.S. and/or with the entirety of their higher educational experience in the U.S., resulting in being significantly enculturated and socialized into U.S. norms. Kim et al. [21] found that FBF who were educated in the U.S. were similar to U.S.-born, U.S.-educated faculty in terms of research productivity and satisfaction with their professional life. Alternatively, some individuals are born, raised, and educated outside the U.S., only coming to the U.S. for a faculty position. Some researchers have termed these individuals foreign-born/foreign-trained (FB/FT). In the study by Gheorghiu [22], international faculty were defined as those born in a foreign country with a foreign undergraduate degree while U.S. faculty were born in the U.S. or a foreign country but had earned an undergraduate degree from an institution in the U.S.; in their study 10.8% of the faculty were international under this definition, including 55.7% who were U.S. citizens. This reflects the reality that many FBF earn U.S. citizenship [23]. Among the U.S. faculty, only 0.5% were non-U.S. citizens [22].

An array of intersecting demographics can be significant in the experiences of FB scholars. Visa status influenced the number of years spent as post-doctoral researchers before becoming faculty with an associated potential for exploitation in these roles [24]. Strauβ and Boncori [25] found issues with being "double-strangers" among foreign women scholars in the social sciences. Gaughan [26] studied the intersectional impacts of gender, race/ethnicity, and being foreign born on time to earn tenure and promotion to full professor. They included a sophisticated sampling of four STEM disciplines, one being civil engineering. The results found that women were disadvantaged controlling for race, ethnicity, and nativity. White foreign-born men had the

greatest advantage in tenure and promotion to full professor. Among Hispanics, foreign-born status had a negative effect for both men and women for tenure. These are just a few of the many complex interactions revealed in the study. The results imply that similar to other women and underrepresented minority faculty, FB women faculty may face challenges if they conduct CER.

Rosser [27] conducted a meta-synthesis on 30 articles about FB women faculty in STEM. One of the themes identified was that the retention of women FB faculty was partially dependent on their integration into the broader community. In addition, these women may not feel at home in either the U.S. or their country of origin. Perera and Greenidge [28] found that most FBF are in STEM fields, are often highly productive, and bring diversity to the workforce; however, many FBF also experienced a lack of acceptance in their communities. The sentiments toward immigration in the U.S. have recently experienced an uptick in negatively [29],[30] which may exacerbate these problems. These findings point to potential challenges and also personal benefits for engagement in CER among FB faculty.

The literature has documented that civic engagement among immigrants can help them integrate into American society [31], [32], [33]. This sometimes takes the form of "bounded solidarity" where they particularly devote their engagement to groups in the country with shared ethnicity [32]. Engagement in their community may also serve to reduce discrimination that immigrants sometimes face. Giving back locally may also help immigrants feel successful [28]. Almost no published research exploring "community engagement" and FB academics was found. In a study conducted with international faculty in Japan, it was noted that integration into the local community was important in retaining those faculty [34]. Given the lack of literature, studying the experiences of women FB academics with CER could yield novel insights.

Theoretical Frameworks

The current research is situated with a larger study of women STEM academics of color and community engaged research [35]. The study as a whole is grounded in Critical Race Theory (CRT) [15], [36], [37]. A number of facets of CRT are relevant to this focused exploration of women FB academics and CER. Intersectionality is key tenet of CRT and critically important in this research because it is looking at the intersection of underrepresented identities in STEM, e.g., women, race/ethnicity, and nationality. Yosso [38] explains how CRT moves beyond a Black/White binary to embrace other types of marginalization such as immigrant status, language, culture, ethnicity, and class. Stories and narratives are another distinguishing feature of CRT, so-called counterstories, and were the method selected for the research. This "unique voice of color" is legitimate to be advanced via stories that fall outside the usual confines of academic discourse [39]. Thus, the lived experiences of individuals are important and valid on their own merits, without the need to contrast against the experiences of the white majority (e.g., no men were interviewed in the study). Another convergence of CRT and this study is the striving for social justice, which is a frequent motivation for community engaged research.

A second theoretical lens that resonates with this study is the idea of "border thinking" and "world-travelling" [40], [41]. Loya et al. [41] applied these ideas in their study of foreign-born women of color faculty in education fields. "Border thinking requires coalition and learning about one another without conforming. It is in this learning about each other, in the community,

that we resist oppression" [41, p. 1159]. This skill would be particularly useful in community engaged research. The idea of world-travelling means the FB women can agentically "shift from being one person to being a different person" [40, p. 11], a skill that would enable one to be more relatable when working with community members, while also bringing the benefits of CER to wider academic audiences. The agentic element of world-travelling is relevant to CER because it embraces "open-mindedness to learn from others, and to have others learn from them" and "allows for resistance and rebellion" [41, p. 1159] which may be needed to help advocate for justice alongside community partners.

Research Question

This research seeks to answer the question: What are the experiences of community engaged research (CER) by foreign-born (FB) women in STEM fields in academia? Figure 1 illustrates the context relevant to the study.

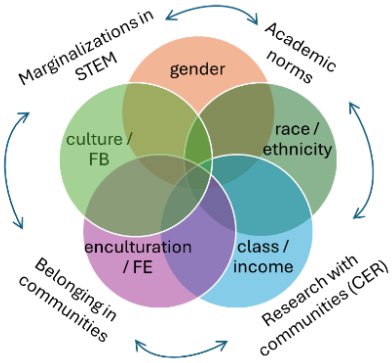

Figure 1. Research frame of intersectional individual identity and experiences within the contexts of academia, STEM, and community

Method

This exploratory research is situated with a larger on-going study investigating the academic pathways in STEM of women of color and community engaged scholars (under an approved protocol for human subjects research; University of Colorado Boulder Protocol 23-0344). To date, thirteen women holding doctoral degrees from U.S. institutions and working in the U.S. participated in narrative interviews conducted by the author between August 2023 and March 2024. The recruitment of these women is described in [42]. Because some individuals may have shared sensitive stories during their interviews, the researcher elected to report only composite demographics, to ensure that the anonymity of the individuals is preserved. Composite counterstory has been previously used in studies grounded in CRT [43], [44], [45]. In this paper the experiences and quotes shared are individual but cannot be linked to the demographics of a single individual.

The research interviews were conducted to hear the stories of women on their journeys in academia, including their experiences as members of underrepresented groups in STEM and their experiences with community engaged research. Whether an individual was FB was not a selection criterion for the study and was not a question that was directly asked during the interview. Rather this background was shared by the interviewees organically in the course of answering the open-ended interview questions. After acquiring verbal consent to participate and record the interviews, the participants were told, "I would like you to share stories about your experiences". This story-telling language was consistent with framing the research under CRT.

Most interviews started with the question “tell me a little about your journey in higher education though STEM.” At some point participants were asked to “Describe some experiences that you have had related to community engaged research (CER).” Depending on the response, a typical follow-up question was “Can you describe ways you believe that your CER activities have been helpful or detrimental to your career aspirations in [STEM field]?” The interviews were conducted over zoom by the author, about 60 to 90 minutes in duration, recorded, and transcribed.

Among the interviewees, five were born outside the U.S. (FB) and their stories are the focus of this paper. The five FB women came from Asia and North / Central / South America. One moved to the U.S. at a young age and earned all of her STEM degrees here. Two were raised outside the U.S. but earned their BS, MS, and PhD degrees in the U.S. Under the definitions in Kim et al. [21] and Gheorghiu [22] these three would be classified as U.S. faculty. Two interviewees were raised outside the U.S. and earned their Bachelor’s degrees in their home country followed by Masters and PhD degrees in the U.S. These two women would be classified as international (FB/FT) [21], [22]. Among the five women, two were tenured full professors, one was a research professor, one was completing their postdoctoral appointment bound for a tenure-track assistant professor position, and one was working outside academia after her PhD.

Through the lens of CRT the results are presented as the stories of CER that were shared by these FB women. Qualitative comparisons to the other eight non-FB women interviewed are made. Consistent with stories, the transcripts have been lightly edited for readability and fairly long inset quotes are provided in order to share participants’ experiences in their own words. Bold font has been used to draw attention to particular phrases in these long narratives.

Limitations. Because the study was designed to understand the experiences of STEM women of color in academia, aspects of being international or FB were not directly asked during the interviews. The FB interviewees were not asked what motivated them to emigrate to the U.S. or how being an immigrant influenced their academic choices, including becoming involved with CER. Given the breadth of topics covered in the interviews, some of the interviewees did not provide in-depth accounts of their participation in community engaged research. Others provided detailed accounts of their CER experiences that are very specific and have been published in peer-reviewed literature. Care has been taken to avoid sharing CER specifics in this paper in order to preserve the anonymity of the interviewees. Another limitation in the study is the positionality of the author. My positionality as a white woman full professor in a particular STEM discipline may have influenced which stories of their experiences the participants chose to share.

Results and Discussion

All five of the FB academics discussed their community engaged research experiences during their doctoral studies (n=2), post-doctoral studies (n=3), and/or as faculty (n=3). The research achievements of these women made positive contributions to the health, safety, and welfare of the local communities near their university, other communities in the U.S., and communities abroad. Their CER included issues such as green infrastructure, water quality, air quality, food insecurity, and public health. Many had also integrated community engagement into their

teaching (e.g., service-learning) and professional service activities (e.g., community outreach into K-12 schools). These types of community engagement activities were similar to the non-FB women who were interviewed.

One FB woman's **prosocial motivations** drove her decision to major in STEM, pursue research as a career, and then conduct CER. In response to the first question about her journey, she shared her career motivation to help people.

> I started leaning towards [subfield of] engineering eventually, just because I was interested in doing **technical work that had an impact**. … impact on making the quality of life for people better…. Engineering was something that I really, really enjoyed. I thought, there's got to be something that I can do with that that literally directly impacts people. So that's how I started. … it was always very clear that whatever it is I was going to do with these tools was going to be to **help people**.
>
> …. Also, as I was training and doing research, I found that there was a lot of power in creating something that didn't exist. So, research to me became the space where I said, Okay, I was not taught about these things, but now I can literally craft something that I think is needed…. Nobody's doing it. And now I have the tools. And so for me it was a place of **empowerment**. I don't have to be like everybody else ….
>
> I want to be proud of what I've done on this earth. …. It doesn't sound like engineering at all. But the engineering to me, frankly, all of the scientific work is the easy part. … the hard work [is] to be a good human being, to see the bigger picture….
>
> I want to be **congruent**. I have to find a space where my **values** as a human being and my values as a professional are in full agreement. It's been a lifelong journey. And I feel like I found it when I work with the communities …. It has to end up in a useful place, and that useful place is to **make people's lives better**.

This idea of community engaged research providing **congruency** between their personal values and their professional activities was echoed by all five of the FB women. For example, one of the women noted that when applying for tenure-track jobs her interest in community engaged research was "one of the key terms" she looked for. She stated, "In fact, I just came back from [a job interview] and the reason I applied to their school was [it] literally mentioned community engagement research in the job description, and I got very excited." After a follow-up question, she indicated that she had only seen one university explicitly mention that they desired community engaged research in the job ad, but "I'm sure other schools have their office of outreach or engagement that does these types of activities." This prosocial motivation was found among all of the interviewees who conducted CER, beyond just the FB women.

One of the interviewees was the initiator in learning to conduct CER during her graduate studies. She came to the U.S. for her graduate studies, and initially worked through language and cultural differences. She started doing CER in the third year of her graduate studies. She saw an announcement from the university about a program on outreach and engagement offered by the graduate school. They offered summer intensive training and certification in community engagement for graduate students. She elected to participate because it seemed like a great opportunity that was well-aligned with her dissertation research which required her to go into the community to collect environmental samples. She recognized that her dissertation work could

“easily transform to community engagement.” Her faculty advisor didn’t design the project for community engagement, but she saw this opportunity. Her PhD research was published in standard academic journals and she also presented her findings to operators and engineers at a local water utility. She acknowledged, “to be honest, at that time was I was a PhD student, I didn't really have too much freedom to do much [community] interactions. But when I become an independent PI, I can involve a more diverse aspect for the engagement.”

In describing lessons that she had learned about best practices and cautions about CER, which began formally during her post-doctoral training, one FB woman explained:

> My thing is solving a problem. So that problem is what drives me. If the people need a problem solved, I must have the tools. If that means I need to learn a new tool or even bring on a new person to help us with that piece I will, because it's about solving the problem. …. That's what I mean about bringing people together. That's what I know about myself. Because I don't wanna be the one known in the world as a [tool] person. Not that. I don't even want to be known. I just want to spend my time on this earth **solving problems for people who need a problem solver**.
>
> [In my first community engaged research project I discovered] I need to pick up more tools. So be it. I have to do it. First IRB. Ever. From there everything I did, every single project I've done no matter what part of the world, I always have an IRB. That was how I was trained by an excellent person. He said, that's what you do when you work with people. I've encountered many people who don't want to do that, and I know why, to some level. I mean my suspicions are that they really don't want to protect the people. Very simple. This is about protecting people and trying to do a good job, and so there is resistance to some extent to protect people. And that’s why I see myself as **I'm not only a scientist**, so when I work with communities **I'm one of them. I'm one of those people in that community**. And I want this to be done right. But the difference is that I'm no longer ignorant that these entities outside are doing it wrong, whether it's on purpose or whether it's because they're in competition, or whether they refuse to get more training, or they don't value it enough to wanna do something that is useful.

The FB woman explains that she has a breadth of technical training, but that doesn’t constrain her work with communities. She will learn new skills or work with others to mobilize what is needed to yield a helpful outcome for the community. Among these skills she learned the process of getting Institutional Review Board (IRB) approval for any research that involves human subjects. Most researchers in engineering and physical sciences are unfamiliar with this process. She questions the motivations of STEM researchers who engage in CER without an IRB.

The last paragraph of the narrative above harkens to the “world-travelling” ability of this woman. She continued to elaborate on this idea.

> I'm in those two spaces just like I am an emotional person and I’m an analytical person. I'm that complex. So I am the researcher and the subject at the same time. And I'm that smart and capable to hold both spaces. Some people can't. And so that's what complicates things. I go there and I’m trying to **think about their perspective**. But as a scientist I know I cannot just

> change things. …. But… **I can see things that other people don't see**. I can ask questions that some people don't even think of asking. … Because interpretation is a lot. You know, 'there was not a problem.' I read papers where they didn't find a problem. And there is a problem. But they did not ask the right questions. …. And so they come up with studies that produce no outcomes [for the community].

She critiqued much of the CER work that she had seen in STEM, contrasting it with her beliefs about high-quality CER. Holding a traditional notion of science ignores the critical human side of CER which then fails to produce meaningful outcomes for the communities. Many STEM academics who engage in CER may be experts in their narrow technical field but are not trained or competent in the human side of CER and ignore these crucial skills.

A FB/FT woman conducted post-doctoral work at a U.S. government research laboratory. There her research engaged less directly with communities compared to her doctoral research but was still looking at issues for specific cities and towns. She noted "we did a lot of activities within the community. … one of the main concepts is to break down the silos, which means that they want to mingle the scientists and engineers with social workers, medical students, veterinarians, to tackle one common challenge… [working towards] environmental equity and justice."

The experiences of the FB women in academia in the U.S. each included numerous successes, supports, obstacles, and conflicts. One woman discussed being bullied as a faculty member and the absence of others stepping in to defend her. She discussed how she would expect this to be different in her culture.

> I'm very deliberate with my children when I speak about being **strong enough to be the one different**. That kind of strength is not part of the American culture. …. So you're immersed in this culture that is more of we gotta give you space. We've gotta preserve our space. It's very individualistic. I have to take care of myself. You have to take care of you. And so there's no real community. I come from a very different culture where the **community takes precedence**…. because in order to have a happy life, you need to have… [the community for] survival, especially when you're being hurt constantly. So the protection comes from our community. So for those of us who come from that space [of] having that protection and then we go into this place, we're completely unprotected.

The FB women understood the experience of being an outsider or different, having experienced multiple cultures. They also had likely experienced marginalization as women in STEM fields and with additional minoritized identities (e.g., people of color, some from low-income backgrounds). These personal experiences likely imparted empathy with community partners. In addition, global cultures differ in their attitudes toward civic engagement and volunteering, egalitarianism and hierarchy, as well as individualism versus collectivism [46],[47],[48]. These cultural differences can be significant. The skill of navigating different cultures can be beneficial when working with communities.

Extended Story 1

An interviewee was a full professor in her department, the first woman to reach that rank in its 70 year history. In addition to her traditional STEM research and teaching activities, she was active in CER. Community engagement threaded through her teaching, service, and research

activities, which was unique within engineering at her institution. In describing how she first got involved in CER it was clear that she would have volunteered to help her local community as a personal activity, regardless of ties to academia.

> So I guess my interest in community… was more in volunteering, just being a good participant of the community. Yeah, that was always just in my **upbringing**, my family, my parents, grandparents, were all involved in one way or the other in **community service**, so that was always there. I was involved in community service projects even when I was in grad school.
>
> But it was by chance when I came here to this institution, and I was talking to someone from a [nonprofit group about] my expertise …. And they said, Oh, we could use your skills here and here. And I was like, Okay, let's do it. And at that point, when I started working on it I didn't even know there was this existing field [of community engagement]. … I slowly started learning more about [community engagement]. And then I found peers, and I felt like I was in a space where people knew the value of this research. The people who are fighting for this discipline and defining this discipline, and that got me even more motivated to keep going and working on that. Knowing there are opportunities where I could **actually use my technical skills to serve the community**.
>
> …and I would talk to students in class about what I was working on [and] they would say, Oh, this is so cool! How can we get involved in it? And I had no idea how I could formally start doing this in class… I found out there are other groups here outside of engineering that I could go talk to, who do **service-learning** especially in ag, leadership, and education …. And then I found out how this can be more structured.

Her story reveals that community engaged research and teaching were not as common in engineering as in some other disciplines at her institution. This reinforces the importance of understanding the impact of STEM culture on CER. It took work for her to convince her colleagues that her community engagement was more than something "nice" but rather had real scholarly and educational value.

> When I started out it was considered cute, right? Because it's like, 'Oh, you're a woman, and you want to do service, you know, go help…. That's nice.' [But] you know this is more than my service. It was involving my teaching. It was involving my research. And this is my **professional responsibility** that I am trying to bring in these ethical [and] moral values to our students….
>
> Thankfully, I got a lot more **support outside of the college**. … there's support available. [But] it's not like a system that was already existing. It was my responsibility to say, hey, we're gonna do this. This is the impact. This is what I need. This would be the benefit. And I have to create that narrative each and every time to justify that. So that's **an extra burden**.
>
> To me personally, teaching a community engagement, service-learning course is already much more burdensome than teaching a regular class. … A community engagement [course requires] all the prep work that you have to do with your partners to get them ready, get your

> students ready, and bring them together, and work out differences, and get them to work together for an extended period and actually have some meaningful impact.
>
> … I had some times in my annual performance reviews where [they said] 'this is good service. But how are you gonna improve on your research?' And I was like, this is my research. I'm writing grants. I'm writing papers. I needed to educate my colleagues and supervisors that it's not **just** something that I'm doing out of a good heart, which I am. But you know this has bigger implications than that.

She did not think that her colleagues in engineering viewed the value of her journal papers on CER or grants that funded her community engagement work to hold the same value they ascribed to more traditional 'technical' research.

> …they're open to it. 'Oh, I see how hard and challenging it is and how impactful it is on the student. We *thank you* for doing this, having this impact on the students.' They highlight me for awards and all of those because it's nice and unique, and talk about it outside to the community. But it's not a machine that puts a man on the moon, right? … it's somehow **considered second class research**.

The interview made it clear that the professor found her community engaged activities personally meaningful and rewarding. Compared to more traditional teaching or research in engineering, community engaged activities took extra work to ensure that community benefits were genuine while also realizing student learning and/or research outcomes. There were also challenges in advocating for her work to be appropriately valued in her annual merit review, promotion, and tenure. She was ultimately successful in finding a supportive professional community, personally rewarding activities, and reaching her professional goals. Similar stories of CER devaluation by colleagues but ultimately success in reaching full professor were shared by other non-FB women who participated in interviews as part of the larger study.

Extended Story 2

A full professor started conducting an array of community engagement activities in local areas near her campus shortly after joining the university when she was an assistant professor. This spanned activities with local K-12 schools to bring engineering into the classrooms, as well as community engaged research where she joined on-going activities with multiple departments across the university (previously outside of engineering only). Her research portfolio to earn tenure was mixed between more traditional STEM research and CER.

During her graduate studies the lab where she worked included community engaged research, although she did not work on that project herself. She did feel that there were **missed opportunities** in the research to make real connections. "I had an undergraduate researcher who worked with me for a bit, and she was Navajo. And [the research location] is connected to Navajo land, and that sort of history and interaction was something never discussed. We had this huge grant and brought all this equipment to do this work, and it was like doing this work in a vacuum." She described another project that was motivated by the fact that "people are being exposed to really high levels of [heavy metal] pollution. And we were pretty much just in the lab

doing research and experiments … **totally in a vacuum** from these things that you always stated as justification [for winning the funding] because it impacts these people's lives."

One of the first projects she joined at the institution of her first faculty position involved a partnership with a local elementary school in a majority African American community. "As a Black professor, I was also **looking for that kind of community** and it was definitely the one closest to campus." This service-oriented community engagement activity helped connect her **personally** to a group that made her feel welcome and a sense of belonging in her new city.

Through this project she became part of a larger set of community partnerships that were cooperatively embraced by the town mayor, the university president, and faculty from the African Studies and Public Health programs. The university decided to pursue the optional Community Engagement classification under Carnegie, and put more resources into supporting local outreach, service-learning, and CER. She won federal grants to support a range of activities related to green infrastructure, such as creating stormwater ponds that could also be used for science projects by local school kids. Many projects were collaborations among multiple faculty on-campus including those from anthropology and geography. The projects included technical aspects of engineering alongside education goals and other benefits to community partners, fulfilling a range of 'broader impacts' valued by the U.S. National Science Foundation. Projects eventually embraced creating employment opportunities with municipalities (e.g., operators of public works) or creating businesses. She emphasized the importance of the individuals engaged from all sides in the success of these multiple community partnership activities. The commitment and buy-in to respectful partnerships changed when different individuals moved into key positions in the city, local community, and the university.

She described other community engagement activities related to urban transportation that involved complex political factors including state funding, state agencies, and private consulting firms. She discussed the contention around being labeled an "**activist**". Others have also drawn attention to the tension between academic science and activism (e.g., [49], [50], [51], [52]). She also described that the requirement to hold public meetings fell short of honestly engaging with communities. There are often disagreements about the best course of action, with particular communities benefitting while others are harmed by some decisions. Those harmed are often "those without power – typically African Americans, Latina/o's, Native Americans, immigrant, and low-income populations" [53, p. 1053]. Working with communities sometimes requires us to leave the dispassionate bubble of academia.

Extended Story 3

In the context of discussing community engaged research, a participant noted that individuals from minoritized and/or underserved communities are not viewed as researchers or being trained to help their own communities.

> One of the biggest things … for me right now … it's all **capacity building**, right? So how do you get people who are from the community to do the research and educate people from the community so that they're also researchers. Whether they want to be in academia or that they're citizen scientists, or not. But then I see a lot of people who were not from the

communities doing research and that also can create strain. And then those people who are from those communities come up with the ideas and then are put on different projects.

And so … I wish it wasn't like this.

The researcher then shared a little about her own background.

I myself am not Native American, but…. **I grew up in a different culture completely**. I wasn't born in the U.S. I did migrate when I was really young, though. So I had that conceptuality of being in an immigrant household with my mom being the immigrant, never been in the U.S. And then, my dad being the white American [military] dude. So I got to see kind of both worlds, right? But then, at the same time, maybe as [half nationality], it would have been cool if there were opportunities for me to go to [my mom's home country] and do research. But then I saw people at the university doing research in [my mom's home country], and they're in no ways [from that culture].

…. It was a good **cultural exchange** to have a lot of white presenting people learn, so that they're not appropriating knowledge or repeating history, you know, just robbing data. So it was good in that sense. But then I knew a lot of Native people who would have loved to have that scholarship, too, and I just didn't understand.

It's like a lot of Native people are not **doing work in their own communities**, even though they'd love to. Or they're the ones that are getting consulted for the work, but then they're not the ones who are first author on the paper. That was like a big thing that I saw was that they were kind of opening the door for researchers to come in. But then they weren't getting recognized at the back end in the paper…. Where was their invite to write most of it, or is it this thing where, essentially like minority women especially, aren't really told these **hidden truths** of how to navigate the university system….

This researcher had done a lot of community engaged research in her doctoral and postdoctoral studies. She recognized that it would be best for researchers to come from communities who need help, but that this was uncommon. She found that:

I think community engaged research is still like a young baby child in Academia, really from the engagement part. My [PhD] really taught me a lot about community engaged research, especially with Native nations. And so that was really an eye-opener for me. I think when you come from a minority community and have those experiences, there's that **sensitivity already there**. But then academia is like, no; just data not people, and numbers **not people**. So it kind of **desensitizes** you to that.

I had to educate even my lab on community engaged research, in the scope of [my STEM field]. Our department was kind of a leading force in community engaged research for the college. But there is still a lot that was being missed. Like when you're doing community engaged research as a professor or the PI of the project, **what's the community?** Is it just your test subjects quote unquote? Or is it also your graduate student that's doing all the research and making sure that they're in the right mind mentally and physically to also engage with the community. And **what are the priorities**? Is it really the deadline? Or is it the **relationship making**? And was that grant proposal written in such a way that relationship making was the most important and then deadlines were secondary. Because if you don't

> have that relationship, then how are you going to get really good data. … how do we understand the context without understanding people's behaviors?

She continued to elaborate on what she learned through her post-doctoral experiences with CER:

> Is your funding really supportive of the community engaged research? Or did you just write it to support the data, not the people? What I saw was that there was support for the data. And then, meanwhile, while we're there taking samples we're also trying to talk to people and fit it all in this one thing. But I was like, no, we should go drive out and **talk to people first** and then do the data, not do it together. It's basically like someone who knocks and says, 'Hey, can I open the door' as they're opening the door. So that was one of the things where it's like this **give and take between deadlines and then people**. And I think that's really something that still needs to be teased out on community engaged research. And then also just **sensitivity** on relationship making and then putting in **enough time** to build those relationships before the research and having funding to do that….

She then reflects that graduate students sometimes are caught in the middle of these trade-offs and tensions.

> Grad students … we're new into the game [so] we still have that sensitivity in a way. Cause we don't see those deadlines. We're not the [Principal Investigator]. We're just doing the work. So I know some people who use their own money to go out and relationship build. And to me that's not fair because who's actually getting paid enough to go do this? Arguably, the professor is getting paid a lot more than the graduate students who's getting paid under the poverty line. And they just **have the heart** to go out and build those relationships. Because they're also the **face of the project** most of the time. ….
>
> At the end, once all the data is there, the lab just said, Okay, we're done. And I said, No, we're not done… we have to go back and present this. … so that they're just not left out in the dust, [we need] to go out to these areas and present the information.

This FB woman knew that CER must include adequate time to build relationships. But her experience with CER as a doctoral student and postdoc revealed that the benefit to the community was often not the highest priority. This created ethical tensions, which ultimately contributed to her leaving academia. Similar discussions of the time needed to build relationships and follow-through with communities being undervalued in STEM were also shared by other non-FB women who were interviewed as part of the larger study.

Conclusion

The immigration of foreign-born women to the U.S. was beneficial to U.S. communities via their CER activities. Similar to their U.S.-born peers, these FB scholars also conducted meaningful CER outside the U.S. There were not significant differences in the various themes of CER that were discussed by FB and U.S. women of color in this research. In both cases, CER allowed them to operationalize their prosocial motivations, making their work personally rewarding. Intersecting experiences were important, such as growing up under less affluent conditions that allowed them to readily empathize with marginalized groups in the U.S. Partnering with local communities may have helped the international / FB academics better integrate, countering some of the negative issues noted in other research including isolation within the city and challenges receiving intramural grants [54]. Having a background in at least two cultures provides these

women with skills in discerning cultural nuances in different community settings. This cultural sensitivity is an important skill when engaging in partnerships with communities. All of the FB women discussed the importance of interdisciplinary collaborations and/or the fact that STEM lagged other disciplines in conducting and understanding CER. The FB women variously discussed whether they believed that CER was helpful and/or detrimental to STEM career advancement in academia (e.g., earning tenure, promotion). Further research is needed to establish how best to ensure that CER benefits both communities and the academic careers of the women scholars who engage in this work, and if there are particular benefits or challenges for FB women.

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