

Work In Progress: The Benefits and Challenges of Faculty Development through Interdisciplinary Public Outreach

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WIP: The Benefits and Challenges of Faculty Development through Interdisciplinary Public Outreach

Abstract

This WIP paper will highlight emergent findings from a research project related to the faculty development benefits and challenges that arose when STEAM (science, technology, engineering, arts, and mathematics) researchers engaged in interdisciplinary public outreach events. With increasing calls for interdisciplinary research teams and task forces, the need for faculty to develop their interdisciplinary networks and cross-discipline communication skills is at an all-time high. Similarly, recent global events and crises have highlighted the need to increase and improve the public's engagement and understanding of science and technology along with their uses/impacts on our shared global experiences and daily lives.

To address these growing needs, STEAM researchers at a public research-intensive university in the Midwest volunteered as participants for a research project where they engaged in a variety of interdisciplinary public engagement opportunities in the local community. These researchers were organized into multi-disciplinary cohorts around a theme and worked together to prepare presentations, activities, and challenges for public engagement venues such as hackathons, science museum events, science pubs or cafes, and community art walks. Members of the supervising research team provided training on informal research communication and engagement with public audiences and interdisciplinary communication and collaboration while also observing cohort member interactions and deliverables.

Interviews with each cohort member revealed that both the interdisciplinary teamwork and problem solving as well as the exposure to a breadth of public engagement and communication opportunities had numerous benefits to their development as faculty members. Participation in the research project informed and improved their teaching practices, expanded their professional networks, inspired new research collaborations, and greatly improved communication skills outside of one's own discipline. However, these development benefits did not come without challenge. The time demands of the interdisciplinary public outreach training and events paired with the workload of junior faculty was noted as a difficulty, as was the lack of tangible deliverables that could be referenced in a tenure review dossier.

These emergent findings from this research left our research team with many questions and considerations. While the notable outcomes that emerged from participant interviews tangentially related to the development of teaching and research – two important aspects of receiving tenure – there still emerged a tension between participants' engagement in this program and how it related to what 'counted' toward earning tenure. We aim to report these emergent findings in a more detailed manner and discuss 1) *future directions for research on the wider benefits and faculty development opportunities embedded within interdisciplinary outreach and public science communication* as well as 2) *how to combat the challenges of limited bandwidth and a lack of recognition of faculty development benefits* through a **round-table discussion presentation** format.

Keywords/Tags:

Faculty development; interdisciplinary collaboration; public outreach; informal learning

Introduction & Background

As faculty continue to work in higher education to educate students, conduct research, and create new and useful knowledge that keeps pace with the needs of society, the need to support the development and growth of these individuals has become increasingly important. One area deserving of attention is the development and expansion of interdisciplinary teams in academia. Calls for interdisciplinary academic programs and research teams have increased in number within the past couple of decades (Holley & Brown, 2021; James Jacob, 2015; Lattuca, 2001). These increased calls come for good reason, as interdisciplinary teams have been shown to be creative and innovative (Blackwell et al., 2009; Yoo, 2015), which are traits necessary for complex problem solving. Interdisciplinary work also has its challenges, with research reporting that those challenges (e.g., difference in methods, jargon, focus, timelines, attitudes, etc.) may act as barriers to participation (Holley, 2009). Strong communication and collaboration are examples of skills that are necessary for interdisciplinary work, and if faculty don't possess these key skills, working on interdisciplinary teams may present challenges that extend beyond just the intersection of disciplines. If a broader goal of academia is to cross disciplinary lines and create more collaborations in the name of innovation and progress, opportunities for faculty members to learn and develop skillsets needed for interdisciplinary work will need to become more widely available and encouraged.

The practice of faculty learning to communicate effectively outside of their own disciplinary silos has been linked to positive outcomes outside of academia as well. Global health and climate crises along with deepening political divides have contributed to misinformation associated with complex and global challenges the world faces (e.g., Benegal & Scruggs, 2018; Cuan-Baltazar, 2020). These crises have magnified the need for STEM professionals who are prepared to effectively communicate the societal implications of their work to the public. Skillsets associated with faculty engagement among public audiences are also heavily associated with communication and collaboration with local public science engagement and informal learning venues. One example of this is a portal-to-the-public program (Selvakumar, 2019; Selvakumar & Storksdieck, 2013) in which faculty underwent training to better engage with audiences at museums and science centers and communicate their research topics, outcomes, and implications. Public venues such as museums, children's science centers, science pubs, makerspaces, and hackathon events are opportunities for continued learning and education outside of formal settings. These venues serve communities as places to not only learn, but to gather with others, embrace creativity, and have the freedom to ask questions and challenge assumptions and prior knowledge. These venues are an ideal place to begin bridging the communication gap between the general public and those in academia.

Research Context & Methods

This WIP paper is derived from a project that was designed to address both the need for increased faculty engagement with the public through science communication as well as interdisciplinary teamwork and problem solving. Sixteen STEAM (science, technology, engineering, arts, and mathematics) researchers at a large public midwestern university were chosen to be a part of this research project, were given pseudonyms (the participant 'names' provided in this paper) and were then divided into interdisciplinary cohorts of 3-5 researchers. Together, each cohort went through training on improving their public-facing communication and presentation skills and then participated in a variety of public engagement events hosted by community partners such as science museums, hackathon events, science cafes, and community

art walks (details of these events and STEAM researchers' participation can be found in additional publications (Pelan et al., 2020, 2021; Pelan & Kajfez, 2019).

Data was collected for this research through observations of cohort meetings as they prepared for the community engagement events, observations of cohort participants at the community events, interviews with the participants before and after each community event, and two additional pre/post program interviews: one before the research began and one after all the community events had ended and the cohorts had formally met for the last time. The interviews were coded at an individual participant level, a cohort level, and a project level to reveal insights as to how participation in this project affected the identity and motivation of the STEAM researchers involved. Our full analysis revealed development of the faculty in their identity trajectories as faculty members as they participated in this unique research experience that combined interdisciplinary collaboration with public science communication (Pelan et al., 2021) (Desing et al. Under review). However, this WIP will focus specifically on the exit interviews and the benefits that faculty described as most impactful, as well as the challenges of participating that were identified. For this paper's analysis, specifically, each participants' exit-interviews were coded with two primary codes: "benefit of program" and "challenge of program". All excerpts from each code were grouped together to identify commonalities and salient themes across participants.

Results & Future Opportunities

Overall, faculty participants in this program had positive experiences participating in public-facing community engagements while also collaborating within interdisciplinary cohorts. When asked the question if they would recommend participation in the program to other junior faculty members, all participants answered that they would. The benefits that most prominently emerged from the exit interviews related to improvements in their communication and collaboration skills, whether that be with researchers in other disciplines or with more general and public audiences. To provide an overview of the improvements and benefits, some participants said:

"I definitely am thinking more about clarity of presentation, and clarity of writing, and clarity of the ideas of things that I'm presenting. Lately I've been publishing less in niche journals and trying to go for the more general journals. And that requires a different writing scope. I think I've changed my writing a little bit to be a little less discipline specific." ... "I think the act of talking about my research, just the act of..., Because I can write about my research a lot and I can sit up in my room and write, but when you actually have to talk about it and explain it to people who don't know what it is, it forces you to rethink certain things and reframe certain things. So just the exercise of talking about it to others is very useful." (David)

"The biggest takeaway from communicating what we converge upon to the public is that to tell the audience why they should care and why this is important. I kind of applied that to my research too, because whenever I would try to convey my research out, I would've started with why I think it's important. I probably should've started with why other people think this is important. That's starting point to resonate with the people to engage them so that they care" (Jerry)

“I've really enjoyed getting to practice my skills at talking to the public about my work. I'd never thought about my research as something that the public would be interested in or that the public would even really want to understand more about because it's not hard science, it's not fancy, it's not fun, but [Science Museum] was really fun. [Science Museum] was cool because people came and engaged with me and asked me questions and that was just really neat.” (Maria)

Many also appreciated that this work allowed them to expand their professional and social community networks outside their disciplines, as well as expand their understanding and expectations of how they can participate in interdisciplinary work in the future.

“This project has been an invitation to think about how to work together with people who have different sets of ideas, different expertise. So that's been really great.” (Doug)

“It's really helpful, I think, to just be able to talk to people who you wouldn't normally speak with and they might know something that you don't know about. Oh, did you know about this internal grant or did you know about this process or whatever? And so I think that's really helpful.” (David)

“This project helped me to see and to be creative about the way I could seek out other people in other fields that I thought would never have anything to do with mine if I just had the time to talk to people. So it didn't change my desire because I've always been collaborative and always wanted to work with people since I first arrived and started this job, but it did make me go, I wonder who else is out there at the university that could be really cool to collaborate with?” (Maria)

Alongside these benefits also existed challenges of participation. Despite the positive outcomes, faculty noted that at times the interdisciplinary collaborations were challenging, and many noted the amount of time and mental energy that was needed to participate meaningfully.

“The way in which we were challenged here as people from different places with different vocabularies to work towards common ground, yeah. That was a good challenge. That was important.” (Doug)

Specifically, some were concerned with the amount of time it took compared to the outcomes that most directly served the goal that most faculty participants were working toward at that time – earning tenure.

“If I didn't have such a packed schedule, I could just duplicate myself. There's going to be a whole another [Amy] that's just going to go find ways to write something cool and fun with your movement. I would love to fit that in my schedule somehow. It bums me out that we don't even ... There's not really time to talk at this point. There's just so much that I have to do with my work, but yeah I would love to make space for it. I just don't presently have the space for it.” (Amy)

“Acknowledging that there is a reasonable amount of time commitment. On one hand, one would probably not rate it as high time commitment to many other things, but these things start adding up. So I think that's one thing to really consider.” (James)

“I think now is really the time, you know, you do have to make a name for yourself and then get promoted. But then after that I think you have a little bit of wiggle room. Right now is the time when I'm trying to, you know, think about my next direction. (Lesley)

“I would need to make space in my research pipeline to be even able to pursue [interdisciplinary research collaborations] because I know the time involved and I know I couldn't do it well, so I'm going to hold off until I have the space to make that meaningful time set aside.” (Amy)

What our research team found interesting is that faculty spoke to these benefits often and highly recommended the program; however, they struggled to connect the benefits as something of value to them with regards to their own faculty development and progress toward tenure. Research has found that academia generally values research inputs (grants) and outputs (publications) most heavily when it comes to considering someone for promotion and tenure, followed by teaching quality (often measured by student evaluations) and then service to the department, university, and/or community that is not often measured or assigned specific metrics for evaluation (Alperin et al., 2019). This also seemed to resonate with our faculty participants, as some expressed concerns with how participation in this program fits into the current academic systems in place.

“The pressure on junior faculty, particularly those on the tenure track to get tenure is based mainly on your ability to publish work, your ability to write articles. And oftentimes those articles have to come from the high impact journals of your field. So I certainly didn't get an article from this experience in a high impact journal in my field... I think if the goals of this structure were structured differently so that that was one of the outputs, we would all coauthor a piece and then we would all put it in a journal or we would cut it four ways and put it in different journals, then absolutely it's a worthwhile experience for all junior faculty.” (Todd)

“I don't know what the selection process was, but we all submitted proposals. We were selected. We were winners. We won something. I don't think that any of our departments think that we won anything. And so, yes, it was a good experience, yes, it was incredibly stressful because it was extra, it was always seen as extra.” (Mitchell)

While participation in this program may not have resulted in grant money, publications, or teaching credits, benefits and outcomes described by participants do relate to their development as researchers and educators and can affect the characteristics, output, and metrics used when being considered for promotion and tenure. Some faculty participants did not make this connection, but others did with varying degrees of reflection on the applicability of their growth in communication and collaboration skills related to more tangible promotion and tenure metrics.

Table 1: Applicability of Participation in the Program to Faculty Research and Teaching

Applicability to Research	Applicability to Teaching
<i>"I mean, research is fine and of course it needs to be something which is recognized because in the end you will be judged by</i>	<i>“Capabilities to be public and maybe develop a talk, which is not just basically your facts and slides where you just put your images</i>

<p><i>publications. That's one of the other criteria. But you also need to be a communicator. I mean, even if you do good at science, you should not assume that people read your papers because there are thousands of us somewhere. So if you want to have a recognition or make an impact, you also have to do these outreach activities or marketing exercises." (Jakob)</i></p>	<p><i>there, but make a story out of it and maybe bring some of those items with you and maybe throw it around. Even, I guess, for in-class teaching it would help, not just for conference presentations or Science Pub presentations" (Jakob)</i></p>
<p><i>"I think that it was mostly about how to communicate with others which I guess is relevant to me also as a researcher." (Lesley)</i></p>	<p><i>"Trying to find more about the students, what they're interested in learning, their background, in addition to which classes they've taken previously, and also general interests and things they hope to learn from the class. Trying to design assignments and projects that have a personal meaning to them. But then also, in the teaching, trying to work in those personal connections." (Sean)</i></p>
<p><i>"And I would also recommend it just for political reasons because it looks great on any NSF proposal because outreach and dissemination of knowledge, it's important." (Jakob)</i></p>	<p><i>"So I had my grad student [with me at the event], he says, "Why are you going through all this?" Right? "What are you gaining out of that?" But you know, I'm an educator above all, that's why I'm in academia, right? Otherwise, I'd be doing engineering in industry. But I see this perception a lot. They think that I'm kind of the weirdo doing outreach stuff. I feel like lots of people see it as a waste of time and resources. I don't know, I enjoy doing it." (Alena)</i></p>

From these exit interviews, we specifically noted the ways in which the faculty participants 1) do not appear to be making strong connections between the benefits they described and their own professional growth and development working toward tenure status and 2) describe the outcomes of the program not being valued by their administrative leadership or even taking time away from tasks (i.e., research) they feel the leadership values more. It is our hope that these findings lead to future conversations and research related to the ways in which service through public engagement and interdisciplinary collaborations can be valued and appreciated by both faculty and academic leadership for the benefits they provide to faculty for their professional development and growth.

Roundtable Discussion Questions

This WIP paper was written to be presented as a roundtable discussion hosted by the Faculty Development Division at ASEE 2023. As such, we have provided guiding discussion questions for the roundtable attendees related to how the benefits and challenges described by our participants may parallel the experiences of others and what could be done to more broadly

recognize and utilize unique and innovative opportunities for faculty development in non-traditional places such as community service and engagement or interdisciplinary collaborations.

Q1: What knowledge, skills, and abilities do you think are important to improve professional and informal communication?

Q2: Through what unique experiences have you felt you've grown/developed as a faculty member?

Q3: In what ways do you feel as though aspects of your growth/development as a faculty member might not be valued, recognized, or 'count' toward promotion/tenure?

Q4: How could your growth/development of new knowledge/skills/abilities as a faculty member be re-purposed or re-packaged to more clearly communicate their value in a tenure dossier or promotion package?

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