REPORT

Landscaping Overview of the North American
Science Communication Training Community

Topline Takeaways from Trainer Interviews

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KEY ISSUE

Professional science communication training organizations and programs appear to have grown in number and reach in recent years. These trainers are now key players in science communication practice, helping scientists across disciplines enhance their public engagement acumen. To date, however, little attention—empirical or otherwise—has focused on understanding this community of trainers and its practices.

BACKGROUND

Recent years have also witnessed renewed calls from scientific leaders beseeching their colleagues to engage with public audiences about their work and its value. This reinvigorated interest in science communication has been coupled with the growth of training organizations and programs designed to help empower and improve scientists' engagement efforts.

As this training infrastructure continues to expand it seems increasingly valuable to understand this infrastructure so as to maximize the likelihood of its positive impacts on the scientists being trained and on the communities these scientists reach. To date, members of the training community appear to operate largely in isolation from each other and with few opportunities for mutual learning. The current lack of interaction among trainers likely hamstrings the community's ability to build scale, diversify reach, and identify agreed-upon best practices. Our expectation is that the community can make significant strides toward achieving its full potential once it understands itself better.

PROJECT DESCRIPTION

This research provides an overview (i.e., landscape) of the current North American science communication training community. The project expands on the research teams' recent NSF-AISL funded work.

We conducted semi-structured phone interviews with 32 trainers over a three-month period (July-September 2017). These interviews were designed to unearth qualitative insights from key players in the training community about numerous issues, among them (1) their organization's origin/evolution story; (2) what they seek to help scientists achieve (e.g., civic impact, individual-level behavior change, etc.); (3) whether-or-not they help scientists identify/seek particular communication goals (e.g., helping policy-makers, empowering citizen decision-making); (3) what makes their approach unique/different from other trainers; (4) their organization's diversity, in terms of staff composition and scientists trained; (5) near-term projections for their organization's priorities; (6) their current sense of "best-practices" relative to science communication; and (7) desired collaborations with other trainers.

We contacted interviewees with a range of experience, but placed substantive focus on the most active training groups. We used snowball sampling to supplement and update our database of trainers and ultimately interviewed 33 trainers from 32 organizations. More than 5 in 10 identified with biological sciences, about 2 in 10 identified the social sciences, and the others were spread across a range of

fields. About 9 in 10 indicated they were white and almost 6 in 10 identified as a woman. The average age was 41. About half said they had Ph.Ds.

The results that follow represent initial "topline" findings from the trainer interviews. The findings should be viewed as tentative as they are based only on initial analyses that need to be supplemented by deeper qualitative analyses in coming months.

OVERALL IMPRESSIONS

The current model of science communication training is one where a range of well-intentioned, thoughtful individuals and groups provide guidance to mostly self-selected, mostly-young members of the scientific community. This training typically involves helping these individuals find and refine their own message or story and then expecting these individuals to find their own opportunities to share that message or story while also being committed to listening to others.

Trainers hope that the sum of these individual efforts lead our fellow citizens to desire science-based policy and that our government decision-makers will listen to advice from the scientific community. If we do provide guidance on what science communicators might specifically say it is mainly that they should emphasize clear benefits to the individual or society.

A subset of training programs are beginning to find ways to draw on insights from communication and education research. The increasing use of social science evidence represents a shift away from training built largely on the professional experiences of trainers, although these remain common. Only a small number of training try to help scientists think about how to assess their impact. Indeed, most trainers themselves use only self-reported satisfaction and self-confidence, as well open-ended comments, to assess effectiveness.

Within training practice, there appears to be a widespread belief that training needs to be fun and largely activity based, rather than lecture- or discussion-based. Most trainers would like to have at least two days to train communicators but recognize that even this amount of training is only enough to provide initial lessons.

The information below provides additional detail on tentative organizing themes (i.e., key ideas that arose in initial coding that might help describe findings), as well as some additional summary findings related to specific issues. Quotations from trainers are provided to provide context.

EMERGENT THEMES

 1. CHOOSE YOUR OWN ADVENTURE. Most trainings appear to allow participating scientists to define their own goals. This likely means that training focuses technical skills/tactics such as the ability to write or speak clearly or in a compelling way, including through the use narratives or stories. Only a small number of trainers emphasize strategy in a substantive way (i.e., a focus on teaching scientists when and how to achieve specific goals such as increase policy support, change behavior, motivate STEM career choice).

> *We really work with them to focus on what they want to achieve, and we really want them to define who they are interested in, interacting with, and what they actually want out of*

that interaction, and it's something that I think a lot of them haven't really taken the time to think about (Interview 1).

❖ **THE DEFICIT MODEL LIVES.** Even as many trainers may say they do not want to reinforce a deficit model of communication, many trainers seem to continue to emphasize that their objective is fostering a more informed public and that doing so will lead to better personal and individual decision-making. This seemed particularly common in less-developed programs.

> *What's the ultimate goal? The ultimate goal is to create people … with skills to think critically about things that they're told, and sort of transform that into the decisions that they make as part of their daily lives (Interview 26).*

❖ **LOTS OF PRACTICE (BUT FEW GAMES).** Almost all of the trainers emphasized that they are looking for ways to give participants as much time practicing the skills they teach as possible and letting key lessons emerge from practice. However, only a few programs appear to provide trained communicators a chance to deploy their skills outside of the training. The assumption appears to be that scientists will find their own places to communicate.

> *We had quite a bit of pushback, but critique, that kind of it was too theoretical. It was too academic, which is again ironic in the fact that we're training scientists, but it was too didactic and people didn't get enough chance to kind of try it on and take it out for a spin (Interview 13).*

2. DISTILLING vs. CRAFTING MESSAGES. Most training programs appear to start with the assumption that a message exists and that the challenge faced by communicators is to distill, find, translate, decode, or otherwise make the message accessible to someone who might not otherwise be able to understand it. Only a small number of programs start with a goal and encourage crafting messages that might motivate someone to take a specific, desired action.

❖ **BENEFITS ARE WHAT MATTER.** If trainers suggest a desired message, it is to emphasize the benefits of scientific research to individuals or specific communities. The underlying assumption seems to be that getting people to believe in the benefits of science will lead them to support or rely upon science.

❖ **SIMPLICITY MATTERS.** Even if trainers do not suggest a specific message, almost all noted some emphasis and practice around helping scientists use a clear message, usually to ensure comprehension or recall.

❖ **KNOW YOUR AUDIENCE.** Many trainers said something about the importance of trying to help scientists better understand their audience, but there did not appear to be consensus on what specifically needs to be known about one's audience and how to make use of that knowledge.

3. LISTENING AS A FIRST STEP … BUT WHAT COMES NEXT? A number of trainers said that they were training scientists to listen to those with whom they are communicating. The trainers who mentioned listening did not tend to indicate what they hope would occur because of efforts to listen.

> *Communication is not a one-way street, it has to be a dialogue, and so that's something that I think is under taught in academia and so it's something that we need to emphasize in our*

science communication training and to the core to be able to actually have a dialogue and making sure that what are people need to hear from me, what are they worried about, what are they concerned about, and listening beyond agree and disagree, you know but actually going beyond and thinking about their values and building that core connection (Interview 2).

4. STORIES ARE GREAT AT … SOMETHING. Many trainers said they saw great value in training that taught scientists to use narrative structures when sharing their science. The sense appeared to be that stories helped to make content interesting and, perhaps, increase the odds that someone would pay attention to science messages. Outcomes of storytelling beyond fostering interest and attention were rarely noted.

5. EVALUATION WOULD BE GREAT, IF ONLY XYZ. Almost all trainers said they did some form of short evaluation, most of which was focused on satisfaction with the training. Some also looked at whether there were changes in participants' self-perceived competence (i.e. self-efficacy). The sense was that training is already expensive and time-consuming and thus external resources were needed to support evaluation efforts.

So, I mean that's a fee for service organization. That means that any kind of more serious, rigorous thinking that we do on evaluation comes out of our hides and our nights and weekends. Which is, like that's a problem with the field. If you are a funder and you're going to ask me that question, then put your money where your mouth is and actually be willing to fund something more than anecdotal feedback forms as evaluation (Interview 13).

10 KEY TOPICS

1. UNIQUE SELLING PROPOSITION. When asked to describe attributes that set their training apart, trainers' responses varied widely. Some trainers struggled to identify unique aspects of their program. Other trainers had readily-accessible opinions about their strengths. Some stated differentiators included training efforts that focus on improving interpersonal and non-verbal communication; prioritizing strategic communication (e.g., help scientists understand the "why" behind their communication before focusing on skills); emphasizing communication as an interconnected, multi-stage process; integrating art and creativity into communication efforts; the use social scientific research; and using communication as a conduit for STEM diversification. One identified their unique strength as linking training with behavior.

> *I think there are some programs where it's just training and then it's little bit the implication is kind of like 'okay good luck out there finding some outreach opportunities,' but we actually provide an audience, we provide an event, we tell them when to show up, so they have a chance to practice with what they've just learned, and it's actually a continuation of the training itself. (Interview 5).*

2. BEST PRACTICES. Most trainers were able to quickly identify one or more "best practices" they would recommend to a would-be trainer, and there was some overlap in their suggestions. Trainers commonly said they would warn would-be trainers against recreating the wheel.

> *The first thing I would do is ask them who else they are talking to about the training program. I would introduce them to the idea that there is a pretty substantial community of people at this point who are thinking about this stuff (Interview 32).*

> *As new programs come into being, let's not reinvent the wheel every time (Interview 2).*

Some trainers also emphasized advising would-be trainers to think long-term about their programs' sustainability, infrastructure, and growth potential.

> *I think building in capacity to be able to not only sustain the program, but also expand it. I think it is important that it not be something that just one person is responsible for doing and maintaining, and making sure it grows (Interview 1).*

Trainers also highlighted some similar foci for would-be trainers' curricula, including emphases placed on understanding and respecting audiences, imparting listening skills, establishing clarity of purpose, prioritizing interactive training environments, and inviting creativity.

3. TRAINEES SERVED. Audiences trained are diverse in terms of career stage, but not in terms of cultural and/or ethic background. Further, most training is not designed to account for diversity, nor is it specifically designed to help scientists engage with diverse audiences. Trainers recognize this gap and identify it as a clear opportunity for growth.

> *I feel like [diversity] is all a topic that we haven't attended to enough (Interview 3).*

> *[Focusing on diversity] is not something we've done in the past, but it's a very, very high priority (Interview 5).*

Many trainers suggested that junior scientists are different than their more senior colleagues, with younger scientists seeming more interested and willing to engage. Trainers also note that young scientists are often frustrated by a perceived lack of institutional support for their engagement efforts.

> *I would say that in my experience young scientists are not just excited, but I feel like they understand the importance of engagement and how it could benefit their careers (Interview 18).*

4. THOUGHT LEADERSHIP. Most trainers said they are familiar with only a few other training groups. The most frequently named training programs are COMPASS, the Alda Center, AAAS, and AGU's Sharing Science program. Trainers also sometimes mentioned individuals, particularly author/film-maker Randy Olson and Liz Neeley of Story Collider.

5. TRAINER INTERACTION. Most trainers said they had infrequent interaction with other trainers but expressed near unanimous desire for more frequent and consistent opportunities to interact with other trainers. When asked about competition, most trainers noted a spirit of generosity within the community.

> *The science communication community is so collaborative. I don't feel like any sort of negative competition, you know. I think there's a sense in which we are all in this together and we're all sort of fighting the same fight. … And it's not a zero-sum game. Someone who wants to participate in one training isn't going to not participate in another because they've already learned everything (Interview 26).*

When asked what they would hope to get out of these interactions, trainers commonly highlighted a clearer sense of evidence-based best practices and evaluation techniques.

> *We need some field level frameworks for evaluating what we do and how successful it is. It just seems like a real stumbling block. There is a growing community of people doing this kind of work. And we all have slightly different goals, we all are working with slightly different constituencies. But there is also a lot of similarities (Interview 2).*

Some trainers did express concerns about competition among trainers.

> *I think everybody wants credit for doing it, and nobody really wants to necessarily share on anything, and it is frustrating for me to see that because I understand why (Interview 1).*

> *There's just not enough conversations across institutions and I think there's a perception of competitiveness that doesn't need to be there (Interview 3).*

But many trainers agreed that there is a high demand for their expertise that attenuates the potential negative effects of competition.

> *I want to take all my competitors and turn them to collaborators. There's enough money out there for all of us. The appetite is big enough. And I think we're better working together (Interview 32).*

6. THE SCIENCE OF SCIENCE COMMUNICATION. Trainers expressed diverse opinions about the value of social scientific research and the extent to which it informs their curricula. Most trainers are familiar with the idea of the deficit model and cultural cognition. Some are familiar with the Besley &

Dudo research on communication goals and objectives. Trainers commonly suggested that including empirical research in their curricula helps them establish credibility (i.e., "buy-in") from their trainees.

> *Being able to show them [scientist trainees] like, there is actually a field that studies this and does research on it and publishes on it is really useful for me (Interview 1).*

> *But the other really valuable piece is that we get to show the scientists, we first tell them and if they want, we can show them that everything that they are doing is based on rigorous research, and I think that is an incredibly important part of all of this (Interview 5).*

Other trainers were quick to point out an alleged gap between science communication researchers and practitioners, noting that the research is often inaccessible and difficult to apply to practice.

> *[The research] is super valuable, but the folks in the science of science communication are terrible at communicating (Interview 2).*

> *We certainly don't go to [the science communication research] for a source, like oh, how can I be doing things differently (Interview 9).*

7. EVOLUTION OF TRAINING. Trainers frequently change their program, but often in ways that reflect experimentation instead of evidence. Two common changes stand out: movement toward more interactive training and away from lecture-based training; and offering longer, more substantive training sessions/experiences.

> *We do a lot less talking. …We've learned that the less we talk the more they learn (Interview 9).*

When asked to discuss anticipated changes, some trainers noted the need for increased focus on nurturing communication leaders (e.g., making scientists "agents of change"), establishing ongoing support networks for scientist communicators, ensuring higher-quality and innovation across curricula, and findings ways to scale and extend the reach of programs.

8. UNIVERSITIES. Trainers agreed that universities seem increasingly interested in their services and in what they can offer as institutions to support improved science communication. Trainers also agreed that there is (or will be) a need to distinguish appropriate roles for 'external' trainers and in-house trainers at universities.

Trainers tended to agree that universities can learn from their experiences and should not set about reinventing the wheel. They frequently suggested 'train-the-trainer' partnerships. External trainers said they view their strengths as including established expertise, credibility (because they offer training that serves scientists' interests not necessarily institutions' agendas) and opportunities for greater communication reach (because, in the case of societies, they have wide networks). Trainers also commonly note that universities are epicenters of potential trainees and therefore central to scaling efforts.

> *I think the academic institutions don't have the expertise to provide this training yet. What they do have is the access to the students (Interview 18).*

Some trainers question universities' commitment to science communication, wondering how often it moves beyond lip service.

As we were talking about that reinvention of the wheel, sometimes though this is where the training community could potentially help universities develop curriculum that was based in experience and best practices. The problem is that universities rarely want to pay for that and there's a limit to the pro- bono time that we can give. It's basically, are we going to give away the curriculum that we've developed over years of hard work? (Interview 2).

9. THE FUTURE. A handful of clear issues emerged from trainers when asked about ways to improve science communication training efforts. Trainers unanimously desire to know more about their community. They want to know who the other players are, what they are doing and how they are innovating, how they have succeeded, how they have failed, and how they evaluate their training efforts. They desire more frequent, systematic interaction with fellow trainers to talk shop, brainstorm, and innovate. Trainers are concerned about building scale, particularly in ways that identify and promulgate best practices. There also is a strong desire for improved infrastructure that provides sustained peer networking and continued support for trained scientists. Trainers also commonly highlight a need for cultural change within the scientific enterprise, especially when it comes to pedagogy at research universities.

Institutions [universities] have … some of the levers to start changing the system so that the scientific community sees that, hey, you don't just need to teach students how to ask good scientific questions and the techniques that they actually need to learn to be able to ask and answer a scientific question well, but there are all of these other skills that you need for students to be successful (Interview 18).

10. ROLES FOR FUNDERS. Trainers see some clear ways for funders to help improve the science communication training landscape. Noting a widespread lack of interactivity, trainers desire a consistent opportunity (or opportunities) to interact with their colleagues. Many suggested the establishment of an annual meeting or retreat.

When you get together in a room of your peers, gosh, the opportunities for collaboration and shared learning are huge (Interview 2).

Trainers also are hopeful funders could help support efforts to collect much-needed data about the impacts of training curricula. Such data is widely desired by trainers and could be used to help identify and communicate best practices and evaluation techniques. To date, limits in funding, expertise, and time have made it difficult to obtain these data.

I think a lot more work could be done on the rubrics of evaluation and the core competencies (Interview 32).

My hope is that we would all come together so that we stop all trying to do the same things slightly differently. … There is no need for everybody to keep having the same idea and keep trying to reinvent the wheel (Interview 1).

Some trainers also wondered if funders could help support meaningful efforts to make training programs more equitable and inclusive.

MORE QUESTIONS

Conducting, re-reading, and analyzing the interviews prompted the following additional questions that were not directly addressed by the interview protocol or respondents.

1. Is there a need or opportunity for training that focuses on either (a) helping scientists achieve specific goals, rather than hoping that training is suitable for whatever goals scientists may have, and (b) helping scientists work together to achieve their mutual goals rather than creating a situation where scientists are taught to see communication as an individual activity?

2. Related to the above, to what degree does science communication training focus on communicating about specific research results rather than communication focused on broader scientific themes? What is the relationship between communicating about specific research and our ability to achieve the overall policy and behavioral goals that scientists have for communication?

3. Given the increased emphasis on activity based training, would it make sense to focus more attention on identifying and understanding the most widely used activities? This might entail describing the learning objectives that trainers are seeking from an activity and evidence about the effectiveness of an activity in achieving these objectives. Variations on widely used training activities should be tested.

4. What do we mean when we say communicators need to know their audience and is there an opportunity to clarify different ways that audience understanding should affect communication choices? For example, is the hope that communicators know demographics? Expectations? Cognitive biases? Trust levels? Perceived norms or efficacy? There are many options.

5. If we are telling scientists that increasing knowledge is unlikely to change behavior, what are we telling them to try to change? In this regard, how does the community see increasing "public engagement" (i.e., understood as increased cognition) as being different than education? What effects do we think tactics such as dialog or story-telling have beyond increasing knowledge and how are such understandings reflected in training?

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