Support Systems for Scientists' Communication and Engagement:
An exploration of the people and institutions empowering effective impact
Summary of initiative, landscape reports and workshops

About the initiative:

Many scientists want to connect with the public, but their efforts to do so are not always easy or effective. Visionary programs and institutions are leading the way identifying the support needed to enable scientists' connections with the public. However, the current appetite by -- and demand for -- scientists to do this exceeds the capacity of those who facilitate quality communication and engagement efforts. More can be done to ensure that those who support scientists are networked, sharing best practices, and supported by a reliable infrastructure.

This workshop series, convened by the Kavli, Rita Allen, Packard and Moore Foundations, was intended to view the entire system of people who support scientists' engagement and communication efforts in order to explore how this system can be most effective and sustainable. The discussions examined where this system is thriving, the limits people within the system face and what can be done to ensure their efforts are commensurate with the demand for quality communication and engagement support. Conducted over four closely scheduled workshops in late 2017 and early 2018, the convenings brought together leaders in different parts of the field who bridge scientists and the public and led to the emergence of a number of key priority areas. While the initial intention was to also hold a plenary event to provide a more holistic view of scientists' support system in order to collectively discern directions to advance the field, we feel a more efficient way forward right now is to focus our efforts and resources on building community and advancing these priority areas.

Our invitation-only workshops brought together scientists, academic leaders, engagement professionals, researchers, communication trainers, and foundation leaders. For each workshop, we also commissioned a "landscape overview", to better understand the high-level state of each community. Workshops included:

- Workshop I: Communication and engagement training programs
  Dec. 4-5, 2017 at SUNY Global Center/Alan Alda Center for Communicating Science in New York
- Workshop II: Associations, societies and other professional organizations
  Feb. 28 - March 1, 2018 at the Howard Hughes Medical Institute in Chevy Chase, MD
- Workshop III: Academic institutions
  March 27-28, 2018 at UC San Diego
- Workshop IV: Science engagement facilitators (museums, science festivals, connectors)
  May 2-3, 2018 at Monterey Bay Aquarium
- TBD - Workshop V: Plenary event

The goal of the workshops was to explore how to ensure scientists' communication and engagement support is effective and sustained. In doing so, we hoped to 1) deepen our understanding of how scientists are currently supported in these areas, 2) map the broader support system to expose the opportunities and obstacles that play a role in achieving this goal, and 3) identify strategic and practical next steps that move us closer to this goal. This initiative also aimed to forge and strengthen networks across communities and institutions – and in so doing, take a view of the entire system to explore how

everyone can better ensure their efforts are impactful, mutually supportive, and connected to a greater whole.

Summaries of workshops:

Included here are the following summaries from each workshop.

Landscaping Overview of the North American
Science Communication Training Community

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BACKGROUND

Professional science communication training organizations and programs 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. As this training infrastructure expands it becomes increasingly important to understand its growth so as to maximize the likelihood of its positive impacts on the scientists being trained and on the communities these scientists reach. The goal of this project is to provide an empirical analysis of the current science communication training landscape. This community, we believe, can make significant strides toward achieving its full potential once it understands itself better.

PROJECT DESCRIPTION

This research provides an overview of the current North American science communication training community.

- We conducted semi-structured phone interviews with 33 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.
- 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.

SUMMARY OF FINDINGS

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.

OPPORTUNITIES FOR CHANGE

Most trainings allow participating scientists to define their own goals. This means that training focuses technical skills 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.

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.

Almost all 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. Only a few programs provide trained communicators a chance to deploy their skills outside of the training.

Most training programs start with the assumption that a message exists and that the challenge faced by communicators is to distill, translate, or otherwise make the message more accessible. Few programs start with a goal and encourage crafting messages designed to reach that goal.

Many trainers said they saw great value in training that taught scientists to use narrative structures when sharing their science. The assumption is that stories help make content interesting and attention-grabbing. Outcomes of storytelling beyond fostering interest and attention were rarely noted.

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. Evaluation is valued but largely viewed as being cost/resource prohibitive.

Audiences trained are diverse in terms of career stage, but not in terms of cultural and/or ethic background. Most training is not designed to account for diversity, nor is it specifically designed to help scientists engage with diverse audiences.

Most trainers said they are familiar with only a few other training groups. 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 what they would hope to get out of these interactions, trainers commonly highlighted a clearer sense of evidence-based best practices and evaluation techniques.

Trainers expressed diverse opinions about the value of social scientific research and the extent to which it informs their curricula.

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.

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. 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.
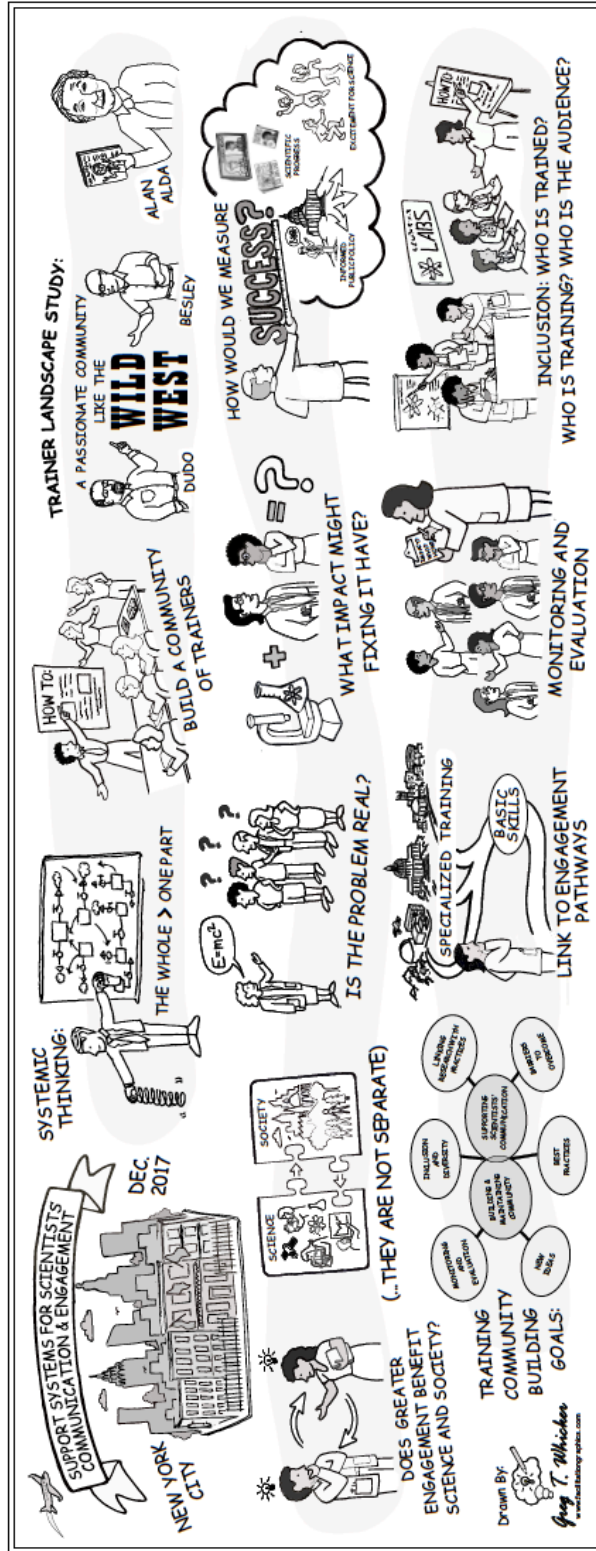
WORKSHOP 1: COMMUNICATION & ENGAGEMENT TRAINING PROGRAMS - PARTICIPANTS

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Landscape Overview of Organizational Support for Public Engagement among Scientific Societies

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BACKGROUND

While scientific societies play an important role in scientists' professional development, they also provide a platform for helping scientists to share new knowledge and build relationships with potential stakeholders. As the value of scientist-public engagement becomes more widely embraced, scientific societies may increasingly provide engagement-related support. This support might include training in engagement skills and strategy, as well as efforts to facilitate engagement opportunities. Societies may also use incentives such as awards to encourage desired behavior. The ultimate goal of this project is to help reveal how societies view the concept of "public engagement" and to provide an empirical understanding of the availability and prevalence of tools that societies currently use to support engagement efforts. Crucially, this baseline knowledge will help guide future efforts to identify and settle on shared best practices, diversify reach, and help form fruitful collaborations among key members within scientific societies and with researchers who study science engagement.

PROJECT DESCRIPTION

This project provides an empirical overview of scientific societies' role in supporting scientists' public engagement efforts from a set of two exploratory studies conducted from November 2017 to February 2018. The project included a survey component with extensive use of both close- and open-ended questions, and semi-structured phone interviews with some of the survey respondents.

We contacted key actors at 277 scientific societies initially identified by the American Association for the Advancement of Science (AAAS) and supplemented this sample with targeted online searches. After 4 rounds of invitation, 76 societies participated in the survey (a 27% response rate). Respondents either were the leaders of societies, such as executive directors, or staff who in charge of public engagement or outreach. Responses are from societies that serve various disciplines and have an array of sizes (e.g., membership rates from less than 500 to over 100,000).

We further conducted semi-structured phone interviews with administrators of 21 societies. These interviews aimed to provide an additional, more in-depth understanding of the opportunities and barriers that society leaders face with respect to public engagement. Questions attempted to capture how respondents were thinking about the specific resources societies have available for members, the demand from members, interactions with other societies, and similar topics. The societies represented in the interviews came from a range of disciplines.

MAJOR FINDINGS

The findings from both the survey and interviews show that scientific societies recognize the value of public engagement, with many of them addressing it as part of their societies' mission statements. However, while the importance of engagement is frequently acknowledged, only about half of the societies surveyed facilitated some type of engagement activity within the last year.

The amount and nature of engagement varies by society. Activity appears to be shaped by the primary focus of the societies, as well as the members' characteristics. Science communication related training is the most common support societies provide for members. Such training is typically either initiated by societies or proposed by members. Most training is organized by the societies themselves and focused on helping members develop specific communication skills for interacting with the public. As might be expected, funding and resources are similarly associated with mission and membership.

Members in societies that had more engagement activities also seem to be more involved and seek more engagement support. In other words, it appears that societies can help create a culture of engagement by providing initial engagement support. Some members request for general help, some members' demands are very specific.

Throughout these 21 interviews, we learned different kinds of involvement from societies and categorized into three types: societies' own practice, such as managing society's website or social media account that aim at public's interest; events initiated or organized by societies with scientist members' involvement; and societies' support for individual member's engagement behavior, such as training, grant, or rewards.

While societies' support for public engagement efforts appear to be driven by society mission, very few societies have identified and prioritized specific engagement goals. Therefore, most societies do not evaluate their overall engagement efforts and may only evaluate specific activities. A lack of clear goals, in this regard, appears to limit the opportunity for evaluation against such goals.

Societies whose members are in policy relevant area or social science disciplines, in particular, seem to put focus more on engagement with policy makers and attempting to play an important role in decision-making. Other societies focus more on obtaining media coverage or producing their own content, often in an attempt to clarify perceived misconceptions.

Societies reported that they have active interactions with other societies, universities, or external training programs. The goals of these interactions include building networks with other organizations, collaborating to learn engagement from others, gaining awareness about related disciplines.

DRAFT WORKSHOP II SUMMARY: SCIENTIFIC SOCIETIES

Leaders from scientific societies, researchers who study communication and learning, funders and other experts gathered for two days to explore how scientific societies can advance a sustainable system that supports scientists' communication and engagement efforts.

The group:
- Discussed the landscape report by Shupei Yuan, John Besley and Anthony Dudo (attached)
- Explored the larger system of engagement and communication, including the need for scientists to listen and open themselves up and the importance of audiences coming first
- Acknowledged the challenges with the culture of science in supporting, rewarding and incentivizing communication and engagement

The priority conversations the group wanted to have included:
- How do we effectively link research and practice?
- How do we support scientists to more effectively *listen* to and understand the needs and desires of the publics?
- How do we involve the community that we're trying to impact or that we want to be led by, so that scientists and the community have a chance to co-create?
- How do we prepare a common menu of options for scientists, and inform them what their options are and what their expectations should be, when they seek out communication and engagement support?
- How do we identify the leverage points that we should pull in the system? There are so many things we *could* focus on, so how do we prioritize?
- How do we establish common language and framing for this work?
- How do we empower scientists to show vulnerability, and say "I don't know"?
- How do we empower societies and associations to create programs that support scientists to communicate and engage effectively?
- Science communication and engagement… to what end?

The group discussed ways scientific societies are uniquely positioned to support scientists. Societies can:
- Connect scientists to the larger world
- Connect scientists to each other
- Connect scientists to the communication training space
- Provide a broad palate of venues and experiences for scientists to communicate in and through
- A national structure that represents scientists and has their back
- Provide a stamp of approval, validation, add credibility
- Offer communication and policy expertise at the national level
- Recognize the components of the invisible infrastructure
- Create awards that recognize scientists, and departments
- Try to influence the academic culture
- Gather like-minded people under a credible brand

- Build skills
- Give opportunities to apply those skills
- Recognize effectiveness
- Be more nimble than universities
- Have steady connections with scientists
- Publish journals
- Access key influencers in different fields
- Break down institutional silos
- Build a collective identify that transcends institutions
- Help scientists bring their whole selves to their professions
- Advocate for funding and programs

Societies are especially good at:
- Training
- Awards
- Networks of support
- Mainstreaming public engagement within professional societies (journals, conferences)
- Mainstreaming public engagement within the profession as a whole
- Convening meetings that bridge scientists with the publics
- Advocacy

The group focused on four discussions they now want to move forward:

Advancing Incentives for Engagement: Can societies coordinate advocacy to affect funding decisions (government, industry and private) that bring more resources to this support system? Can they also coordinate advocacy efforts with other stakeholders (university administrators, chairs, etc.) to seek more money and support to sustain these professionals in a sustainable way?

Linking Research and Practice: Can societies build networks of support between researchers, scientists, and practitioners? Associations represent a nexus where multiple disciplines and practitioners can come together.

Building the Network and the Field: The Power of Connection: Can societies build relationships, share learning and collaborate on action in a sustained way. Can we create a functioning network that fosters shared purpose?

Advancing Listening: Can societies change the culture of science so that scientists truly listen and can find their way to places where meaningful engagement can happen?

A number of workshop participants shared their willingness to lead these ideas moving forward.

WORKSHOP 2: PROFESSIONAL SOCIETIES, PARTICIPANTS

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Chad ENGLISH	David and Lucile Packard Foundation
Meagan GARDNER	Chan Zuckerberg Initiative
Margaret GLASS	Association of Science-Technology Centers
Philip HAMMER	American Institute of Physics
Geoffrey HUNT	LabX, National Academy of Sciences
Janet IWASA	University of Utah
Melissa KENNEY	University of Maryland, College Park
Kelsey KING	Society for Neuroscience
Boyana KONFORTI	Howard Hughes Medical Institute
Howard KURTZMAN	American Psychological Association
Tiffany LOHWATER	American Association for the Advancement of Science
Guru MADHAVAN	National Academies of Sciences, Engineering, and Medicine
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Ellen MCCALLIE	National Science Foundation
Christine MCENTEE	American Geophysical Union
Susan MORRISSEY	The American Chemical Society
Wendy NAUS	Consortium of Social Science Associations
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Trevor PARRY-GILES	National Communication Association
Julie RISIEN	Oregon State University
Caitlin SCHREIN	Howard Hughes Medical Institute
Erika SHUGART	American Society for Cell Biology
Brooke SMITH	The Kavli Foundation
Tobin SMITH	Association of American Universities
Richard SOUZA	Materials Research Society
Rebecca THOMPSON	American Physical Society
Jamie VERNON	Sigma Xi
Chris VOLPE	ScienceCounts
Mary WOOLLEY	Research!America
Sarah YEO	University of Utah
Shupei YUAN	Northern Illinois University
Sonia ZÁRATE	Howard Hughes Medical Institute | Society for the Advancement of Chicanos/Hispanics and Native Americans in Science

Facilitators

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Landscape Overview of University Support Systems and People
Supporting Scientists in their Public Engagement Efforts

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SUMMARY

Scientists (and engineers) wishing to conduct public engagement do so in the context of established disciplinary norms and complex institutional systems that may support or limit their success. The report seeks to convey the known complexity and unique challenges for universities to better support for scientists in their public engagement work and summarize potential levers of change to improve this system. Insights in the report come from review of 26 recent reports that include recommendations for universities in supporting public engagement and a series of seven video conference focus groups across levels of the university hierarchy. Each group included three to five individuals across 22 institutions.

INSIGHTS FROM THE FIELD

Institutional Issues

- Hope rests with the future generation of scientists and accordingly there are an increasing number of opportunities for graduate students and postdocs to receive engagement training. However, counteracting forces are at work. Young scientists who wish to pursue engagement may be less likely to persist in academia, leaving few change makers rising through university ranks.
- Promotion and tenure reform is the trumpeting elephant in the room, but resistance remains pervasive. Some critical challenges relate to how engagement, as coupled with "service", dilutes motivation and opportunity for recognition and reward. Engagement is therefore rarely considered in terms of tradeoffs, but generally done in addition to full teaching and research workloads.
- Engagement does not lend itself to parsimonious metrics and indicators of success. Because engagement is not a direct revenue generator, common metrics are unlikely to compel investments in infrastructure. It may be more useful to consider metrics as a means of accountability and focus on stories of value as indicators of impact.
- New organizational forms and structures with predictable and dependable support are needed to address the enduring challenges associated with public engagement.

Professional issues

- Agency to engage in systemic change seems lacking. Participants had relatively constricted views on which parts of the system they could influence.
- Participants expressed concern that the amount of time to develop the necessary partnerships and collaborations for public engagement is undervalued across levels at universities and by funders.

- Success with public engagement is perceived as the anomaly, a reflection of heroic acts above and beyond professional norms. Scientists' efforts tend to rely on bootstrapping rather than connecting to enduring programs with continued support.
- Scientists who choose to do engagement face social and professional risks including perceptions that they are not serious about science, not competent researchers, or are self-promoters. The academy can still feel like a hostile environment to scientists who wish to integrate engagement into their professional lives. This appears to be less of an issue in more applied disciplines.
- Mentors are important, but many are neutral or tentatively supportive of engagement, few scientists experience mentors who are true advocates in, or partners of, engagement work.
- Department chairs have an important role to play, not necessarily in terms of providing resources or maintaining programs, but certainly in terms of mentoring, cultivating an ethos of engagement, and implementing systems of accountability and reward.

Societal context

- The dominant discussion, even among those biased in support of engagement, still aspired to increasing the quantity of one-way communication to overcome the public's scientific deficit.
- The academy seems to still be divided on the appropriate role of scientists in actively informing policy. However, the current social conditions and public discourse which politicizes science appears to be motivating scientists to expand engagement activities.
- Those who facilitate scientists' success with public engagement experience support from the university, but it generally comes in the form of accolades. These individuals and offices are entrepreneurial in piecing together funding, but the unpredictable nature of their financial support has consequences for retention of people and sustainability of programs.

POSSIBLE LEVERS OF CHANGE

Overall, investments should be strategic, sustainable, and evidence-based. Several key opportunities for investment of energy and resources surfaced in from this work and may improve economy of scale and enable innovation. These include:

1. Expose the actual investments of time needed to successfully implement different engagement activities in order to enable transparent consideration of tradeoffs with other activities. Consider this time investment as related to the lived experience of pre-tenured faculty in terms of workload, trajectories, and ways to reduce risks.
2. Support brokers to magnify the effects of existing programs and facilitate scientists' success, especially for early career or reluctant scientists who may not otherwise find success in their engagement efforts. Establish processes that assess engagement productivity in terms of both enhanced research processes and societal impacts.
3. Avoid attempts to express value in terms of return on investment or simple metrics (e.g. participation hours and grant procurement). Instead, collaborate with social scientists and humanities scholars to develop rubrics about the value of a variety of engagement activities.
4. Investigate how promotion and tenure processes are already changing and how to add thoughtful momentum to the transformation in progress. Focus on local and departmental level changes is likely to be fruitful. An initial step to reform is for departmental plans and scientists'

position descriptions to include specific public engagement objectives distinct from general "service".

Engage audiences who are underserved with little access to science learning and engagement. Intentional engagement with audiences, beyond the "choir", through collaborative mechanisms can move the system beyond the deficit model and pave the way to realize mutual benefits.

DRAFT OUTLINE OF WORKSHOP III SUMMARY: UNIVERSITIES

Key people at universities (VPRs to grad students, public information officers to outreach specialists), researchers who study communication and learning, funders and other experts gathered for two days to explore how scientific societies can advance a sustainable system that supports scientists' communication and engagement efforts.

The group:
- Discussed the landscape report by Julie Risien and Roberta Nilson
- Explored the larger system of engagement and communication, including the roles of administrators, faculty, students and professionals
- Acknowledged the challenges with the culture of academia in supporting, rewarding and incentivizing communication and engagement

The group identified the following priority conversations and potential actions:
1. Institutional Transformation
Challenges:
- Data: We need to collect data that demonstrates the need and the benefits for doing this work (for people, science, and institutions)
- Support Systems: Have support systems to legitimize science communication as a field of study
- Drivers: Can be top-down (president), outside (funding agencies), and grassroots (programs for supporting future leaders like ComSciCon).
- Rewards & incentives for faculty and grad students
- Questions
  - How or should it become part of the promotion & tenure process?
  - Is over-professionalizing this a problem?
Potential Actions:
- Awards & recognition – publicly valuing the work, providing pools of resources
- Linking research with practice, creating recommendations that come out of research to inform practice
- Curriculum – Develop a common set of ideas about things that should be taught, support degree programs and courses to teach communication & engagement
- Better utilizing communications officers to ensure that faculty have these opportunities

2. Systems Change
Challenges:
- Complexity of change of large institutions.
- What do we need to do for the administrators at Universities to help them initiate this?
Potential Actions:
- Survey what exists within institutions - understanding the offices/people/resources that are already available
- Identify and better define the different areas/taxonomy of engagement

- Identify networks between those different resources – hub who can work across institutions rather than just within institutions

3. Listening:
Challenge: academics need to do a better job meeting publics where they are, and having academics tackle real world problems.

Potential Actions:
- Creating a curated resource list/ clearing house for science engagement strategies, toolkits, and experts
- Develop a methodology for listening, incorporating community partners' questions and values for science (use the resources that are already in place in the arts & humanities departments in colleges to develop the methodologies to develop partnerships with communities)
- Have diverse focus groups that allow for different communities to share what their concerns are – work with the community college network to implement this

4. Research & Practice
Challenge: we need strong data and theory in the conversation.
Potential Actions:
- Create a database that allows us to understand who is doing what, and where. Identify the diverse forms of training happening across the country
- Develop a network infrastructure to connect the researchers and practitioners.
- Provide supports for younger scientists
- Note: A rush to consensus might not be good for the field

5. Conceptual Model
Challenge: We don't have good conceptual models to build on
Potential Actions:
- Suggest that Kavli and its partners work to adopt a well-defined framework, with assumptions, inputs, outputs, outcomes, and impacts, for the work in this area
- Get philanthropic funding to collect data and get evidence that engagement & communication programs work, have demonstrated benefits, to be able to show institutional administrators
- Have a certification or compliance program (like human subjects training) that people and universities have to develop proficiency in and demonstrate compliance
- Encourage universities to incorporate engagement with the public in their mission statements
- Kavli could help to provide a list of providers and trainings that are offered, and encourage listing science communication and engagement training on scientists' CVs

How can key groups make a difference? Given universities are complex, and academic culture is strong, the group wrestled with how change may actually happen. Whose responsibility is it? Participants recognized that their peer groups all could give something, but also needed something, for change to occur. Participants divided into affinity groups, and shared their "gives" and "gets".

Boundary Spanners (university outreach and engagement professionals)
- Can offer
  - Programming
  - Access to support structures to prepare people to do engagement work
  - Bridges & access to communities & engagement opportunities
  - Anecdotal expertise & examples of what works
  - Hubs in a network – we connect lots of different communities
- Need
  - Stable funding - We exist on soft money, and are offering as individuals and need to build bigger teams
  - Legitimacy and authority, positions that are valued
  - Professional standards and recognition that this work is valuable
  - Figure out where the resources are to connect our expertise with researchers
  - A consistent seat at the table to make decisions

Scientists
- Offer
  - Enthusiasm to receive training
  - Experience of doing on the ground training
- Need
  - Boundary spanners
  - Need money for boundary spanners, to help hire staff and build resources
  - Universities to buy in and provide faculty and support structures

Associations (AAU, APLU, AAAS, etc.)
- Offer
  - Convening power
  - Dissemination, help getting resources out
  - Credibility
  - Access to institutional and science leaders
  - Share best practices
- Need
  - Money
  - Partners who can give credibility

University Institutional Positions (Communication, Government Affairs, etc.)
- Offer
  - Perspectives & networks
  - We are your advocates
  - Can help people understand the complexity of what people across the institutions are dealing with

- Need
  - Getting together a group of AAU, APLU to do a joint workshop and sustain communications and do some strategic long-term planning, across silos
  - Having big picture conversations so we're ready to take action when the opportunities present themselves
  - Ask for continued research funding and resources

Science Communication Researchers
- Offer
  - Research to bring to bear the practice of communication and public engagement
- Need
  - Money
  - Applying for a research coordination network to have an integrated network of science communication scholars who value research in service to practice
  - Recognition from the field
  - Support from their disciplines/departments to work with other disciplines and practitioners

Administrators
- Offer
  - We can be agents of change on our campus, can influence the culture, influence the university's priorities and approaches to P&T evaluations
  - In a position to provide the recognition and reward systems
- Needs
  - Clearly identified national initiative or problem that we could tag this onto, so it's not just a campus-by-campus effort
  - A way to convince others that this is something the university should take on. Would help if it's a multi-campus effort
  - More funding and opportunities to apply for funding to launch something related to science communication & engagement

Funders
- Offer
  - Funding
  - Convening power
  - Ability to look across the field
  - Partnerships and perspectives from across the field
  - Influence
- Need
  - More funders at the table to increase the available resources
  - A better case made for why science engagement is important, so we can get other funders to the table

- Better examples that are tangible about the good things that happen with the potential for scale – need help telling the story
- To be brought in as partners, listeners, collaborators. Need to invite more funders into the early conversations.
- A funder summit, because many of the issues of silo-ing that came up here also exist in the funding community

WORKSHOP 3: ACADEMIC INSTITUTIONS, PARTICIPANTS

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Landscaping Overview of U.S. Facilitators of Scientists' Engagement Community
Executive Summary of Interview Findings

This summary prepared by Darcy J. Gentleman, lead author of the full report.

KEY FINDINGS

We interviewed 20 facilitators of scientists engaging with the public. The group was very heterogeneous: representing 7 audience groups (some more than one); *70% of those interviewed* have an academic background in science but only *10% of those interviewed* are still active natural science researchers; a different *10% of those interviewed* have an academic background in communications or education. Social media (Twitter) is a vital science communication trends research tool while the peer-reviewed literature holds little priority to those interviewed. Funding ranges from a few hundreds of dollars to millions. Priorities across the 7 audience groups shared a sense of: empowering scientists to go to interested communities; involve scientists of all types but be selective in choice and/or require communications training; present diverse role models especially to youth audiences. The primacy of "fun" over "content" was noted by facilitators working in venues in which audiences buy tickets for access.

KEY ISSUE AND PROJECT ORGANIZATION

Facilitators of science engagement create moments for scientists to directly interact with non-scientist publics. More scientists have or are seeking to engage more in the present time when complex societal issues have thought leaders encouraging this increased engagement to (at least) supplement decision making. Thus, the role of facilitators is of greater importance to create opportunity for and quality of scientist-publics engagement. However, the breadth of facilitators' motivations, venues and approaches has not to date been well characterized.

We conducted 20 interviews of U.S.-based facilitators in spring 2018. We used a semi-structured interview protocol intended for a 30 min conversation that allowed the interviewer to probe more deeply based on interviewee responses. Questions focused on a) the overall nature and scope of facilitations, b) the processes for recruiting, training, and preparing the scientists, c) the intended outcomes from engagements as well as metrics that gauge success, d) the value of having scientists engage, e) ways facilitators hope to improve their engagements, and f) the resources used to stay apprised of science communication trends.

Seven audience sectors were identified: civic groups, decision makers, formal educators (classrooms), media, adult (21+), museums/zoos/aquaria (MZA), and youth. We feel this is a good starting point but not necessarily a complete survey of all facilitator types.

Commonalities Regardless of Audience Type

Two quotes captured the shared sentiment of the 20 facilitators: "I think when scientists are able, they should be talking with the public because it humanizes the process of science." (Facilitator 13); "[Our attendees] were very excited about actually interacting with a real scientist and seeing what that scientist is like … 'they're kind of like me.'" (Facilitator 18).

As noted above the facilitators were very heterogeneous in terms of audience type, funding, and venue. A large *majority of those interviewed* were trained in the sciences but are no longer active in research. This perhaps functions well for recruitment, with facilitators having an affinity to both the scientists and an understanding of what non-scientist audiences need and want. No facilitators expressed a lack of interested scientists looking to participate writ large, although some reported geographical limitations of available personnel. Common themes among the various audience types are below:

Shared Sentiments by Audience Sector … With Caveats

- Civic groups, decision makers, adult, MZA, and youth venues have facilitators looking to empower scientists to go to the community

    Caveat: this adds travel costs that can limit potential programming.

- Decision makers, media, adult, and MZA facilitators seek to involve scientists of all types

    Caveat: they ensure engagement quality by either careful selection criteria and/or require communications training prior to individual scientists' participation.

- Decision makers, educators, adult, MZA, and youth facilitators seek to present diverse role models

    Caveat: this can lead to volunteer fatigue or ironically large recruitment lists of willing participants who wait long times for an event placement.

- Media, adult, and MZA facilitators note "fun" often has primacy over "content" due to revenue models

    Caveat: the metrics for success are not clear.

QUESTIONS FOR THE FUTURE

Who are all these facilitators and how should they be supported in their career paths? Are there such things as "gateway engagements" that catalyze individual scientists into more activities (e.g. classroom leads to decision makers leads to media, etc.), or is it personal preference? Where do the audiences go after the engagement event? What paths do audiences take long after the engagement – in their schooling, career, regard for science? What is the role of engagement events to move audiences from understanding to caring? How will the growing presence of digital natives change engagement opportunities, both by the scientists themselves and the audience platforms? What is the economic impact of these events and are there sustainable business models? What do scientists learn from these engagements?

DRAFT OUTLINE OF WORKSHOP IV SUMMARY: FACILITATORS OF ENGAGEMENTS

Introductory feedback on workshop and central question:
- We are not yet a community – how can we build this community first?
- When we ask "how can scientists be supported" it frames the question as one-directional, can the question be framed with "audience first"?

Shared challenges amongst people who help facilitate scientists' engagement
- Time
- Money
- We don't know what we don't know
- The problem of scale to achieve large impacts
- The science of science communication is either not seen as relevant, not being applied widely, or low on the priority list
- Knowing what our impact is and how we might measure that
- Figuring out how to work within existing structures so it's sustainable
- A challenge of engaging early career scientists
- We haven't mapped out the space, and we're working at different levels of granularity
- Making sure we're not carrying forward historic injustices of the past – building opportunities so all people are able to participate
- We paint scientists in broad strokes
- Is our desire for novelty distracting us, from the tough block and tackle parts of it?

Shared Values & Beliefs (or aspirations)
- That a tight connection between science and society is critical to having an aspirational future where we can solve big problems together
- That access to science and being able to see the world through a science lens is a human right
- Inclusiveness - everybody should be able to participate in science
- To engage effectively is a skill, that can be trained and nurtured
- Humility – we have lots to learn from others, and that there are lots of ways of knowing the world. Science is only one way of knowing the world.

Priority Conversations – the group identified the following topics as important topics/conversations/actions needed to move the field forward:

How do we develop inclusive science engagement? How can science engagement be done in such a way that current inequities in STEM are not reproduced?
- Recommended Actions:
    - Develop a vision statement and shared values
    - Train the trainers of science communication and facilitators of engagement, so they learn from leaders of the social justice community
    - Encourage our funder colleagues to set higher expectations around inclusivity
    - Compensate and recognize the people who are already doing this work

- o Immediate next step: Make equity and inclusion a central part of the formation of this field – specifically as the next plenary (modeling previous bullets)

How do we reframe "engagement" to foreground the values, priorities, interests, and aspirations of the communities?
- Recommended Actions:
  - o Hire community organizers into our institutions
  - o Think through the incentives for scientists to participate in this fully, to broaden the definition of who participates in these programs
  - o Immediate next step: Convene a working group that would follow the group's action map (have a phone call, plan a meeting, landscape existing work, write a theory of change, coordinate with other activities, partner with researchers)

How do we put communities & publics first, and shift the paradigm from "science to" to "science with"? How do we use our access to scientist and public audiences to co-construct coordinated communities' responses to science and societal problems?
- Recommended Actions:
  - o Make humility a value of science
  - o Expand social science frameworks
  - o Lead conversations with communities to reflect on their priorities
  - o Inventory what's already happening, to develop a landscape of public engagement
  - o Work with university presidents to take action on this work
  - o Immediate next step: Connect with existing community organizers.

How to build a genuine community of practice?
- Recommended Actions:
  - o Want an initiative that makes sustainable what we already have
  - o Define our shared values as a community
  - o Break down the different silos between us
  - o Find out where the disconnects in our communication is
  - o Provide resources to help us learn more about each other and what we're doing
  - o Create a network of networks that can work together to move the needle on policy and act on systemic change
  - o Provide fellowships for people to attend convenings and build bridges between various networks
  - o Incentivize collaborative work between platforms
  - o Immediate next step: Strengthen connections between existing coalitions (develop a clear common purpose, do a landscape discovery to define the partners, define the value/ goals we can offer, to bring them to the table)

Explore the fundamental, and controversial question, Is our primary goal to advance science as a way of knowing regardless of the outcome?
As you all approach your work, which of the following two things are you trying to do? Increase the primacy of science as a way of knowing OR engage science with other ways of knowing?

- Recommended Actions:
    - We need to wrestle with as a community – what are our true motivations that are bringing us to this work? What's our true purpose?
    - Write a think piece and put it out in the public domain
    - Write a manifesto and put it out in the public domain
    - Immediate next step: start drafting think piece

How do we avoid the assumptions we often make when we engage? What assumptions are we making about the people who we don't engage?
- Recommended Actions:
    - Find or build a list of best practices for engagement activities that address and value co-creation
    - Identify leaders where there is an effort to avoid assumptions
    - Research to validate perceived best practices
    - Immediate next step: Uncover best practices for solving those assumptions.
    - Identify leaders and orgs who are doing this already
    - Interview and documenting their processes
    - Doing a research review
    - Develop our own research questions and hypotheses
    - Find someone who would own this internally in an organization

WORKSHOP 4: FACILITATORS OF ENGAGEMENT, PARTICIPANTS

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