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Review

Science communication at scientific societies

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ABSTRACT

Scientific societies can play a key role in bridging the research and practice of scientists' engagement of public audiences. Societies are beginning to support translation of science communication research, connections between scientists and audiences, and the creation of opportunities for scientists to engage publics without extensive customization. This article suggests roles, strategies, and mechanisms for scientific societies to promote and enhance their member's engagement of public audiences.

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1. Introduction

> "The centrality of science to modern life bestows an obligation on the scientific community to develop different and closer links with the general population. To help forge this new relationship between science and society, the AAAS is now putting together a new Center for Public Engagement with Science and Technology."

In establishing the American Association for the Advancement of Science (AAAS) Center for Public Engagement with Science more than a decade ago, then-AAAS-CEO Alan Leshner [1] recognized the critical role that scientific societies can play in connecting science and society. The establishment of the center, which now has counterparts at other scientific societies (see below for examples), was an acknowledgement of the "fact that, like it or not, science is an ever-more pervasive way of life for all people," [1]. It also acknowledged the role of scientific societies to drive scientists' engagement with public audiences.

Leshner's words, quoted here, in the announcement of the Center, were a call to action and offer of resources for scientists, and may also be a guide to other scientific societies and their members as they consider ways to offer services to similar ends. This article describes the work of scientific societies that embrace public engagement with science and science communication as models for other societies and their members to consider in order to build capacity across the scientific field for broader and more effective science communication. Much as science societies offer an array of services or access to best practices as relate to science instruction, they are positioned to share such servies or access to best practices related to effective science communication.

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2. Scientific societies

Scientific societies are member-based organizations that connect professional scientists and serve their needs, through activities such as advocacy for research funds, professional credentialing or other benchmarking, publication of peer-reviewed research, providing a platform for member communication, and professional development. Other organizations, notably outreach or engagement offices within universities or government agencies offer similar services and can play a similar role, though usually in a way that is less discipline-specific. A scientific society can offer a discipline-wide vantage point for science communication and are often trusted sources for their members. Some scientists may simply prefer a society, which is not their employer and is discipline-specific, as a starting point for the work of engagement. While societies are not distinct or alone in their work of public engagement, this article focuses on the ways in which societies may capitalize utilize their unique status to promote science communication.

Some scientific societies have recognized this potential and offer programs to encourage their members and other scientists to participate in public engagement or science communication activities. This may include opportunities for engagement at annual meetings, organized visits to elected officials, or speaker banks that offer member-scientists as resources to interested audiences. Some societies may engage directly with public audiences on behalf of members or recognize members' communication efforts with awards.

Since the Royal Society published the Bodmer Report [2] to suggest the need for scientists to increase public understanding of science, more effort has been aimed at understanding motivations for scientists' communication [3], the barriers that may exist to their participation in public engagement, and the impact of various communication efforts, including better understanding of baseline public attitudes about scientific topics [4]. As noted in a Royal Society report, "public engagement will not happen to any appreciable extent unless scientists receive full recognition of their efforts and a supportive infrastructure is created in which engagement can take place" [5]. A 2015 survey that follows on this report emphasizes the continued need for recognition, support, and rewards for public engagement [6].

In the United States, the call for science communication is built into some federal funding schemes, including the Broader Impacts criterion of the National Science Foundation [7]. The National Alliance for Broader Impacts has formed to "foster the development of sustainable and scalable institutional capacity and engagement in broader impacts activity," [8]. While the intent of Broader Impacts is much broader than science communication, dissemination of research and its benefits to society are clear components thereof.

3. What is public engagement

This article addresses science communication broadly, though there are many approaches to science communication. The examples in this article are drawn largely from public engagement approaches within science communication. Public engagement with science describes intentional, meaningful interactions that provide opportunities for mutual learning between scientists and members of the public [9]. This mode of communicating with non-scientists is distinct from a more traditional 'deficit model' approach to communication, in which scientists simply tell the public about their science (c.f., [10]). Goals for public engagement with science (hereafter public engagement) include mutual learning (scientist and public learn from each other), civic engagement skills and empowerment (the ability to use evidence in a decision-making context), increased awareness of the cultural relevance of science, and recognition of the importance of multiple perspectives and domains of knowledge [11]. Mutual learning refers not just to the acquisition of knowledge, but also to increased familiarity with a breadth of perspectives, understanding of one's audience, and worldviews for both the scientist and the audience. For example, a scientist speaking to a neighbor about her research may be able to share her views on research directions, but may learn from the neighbor about her priorities for applications of that research. These exchanges may also prompt the scientist to reflect on what consider important about their research One example of public engagement involves a research group studying climate impacts on coral reefs in the Virgin Islands that discovered a new line of research through a chance encounter with a local vendor in the tourist industry. By answering his question, "what are you doing here," a conversation emerged in which the vendor noted an oil slick over the coral reef left behind after heavily-sunscreened tourists snorkeled each day. The researchers added exploration of the interaction of the active chemicals in the sunscreen with the reef and were able to describe new mechanisms for damage to the reefs [12].

This article focuses primarily on strategies that fit the public engagement mode of science communication, with an emphasis on dialogue between scientist(s) and public(s), rather than mediated communication through journalists, educators, film producers, book authors, etc.

4. Scientific societies as promoters of public engagement

Scientific societies can play a critical role in promoting science communication and in enhancing the science communication being undertaken by their members. Though science communication typically occurs between a scientist and members of a public, a professional system that supports this practice also includes two additional stakeholder groups: practitioners (see below) and public engagement researchers or evaluators (sensu [13–15]). These categories are not strictly bound; many individuals identify with multiple categories or may play a different role at different times or during different activities (for example, a scientist who does large amounts of science communication may consider herself a practitioner; a social scientist who studies science communication is a scientist and a public engagement researcher). Collaboration among the various professional roles in public engagement enrich the participants in science communication. As Leshner noted at an ASTC conference in 2010, "Scientists are starting to learn that they can't do public engagement by themselves. We need experienced partners and that means you [practitioners] [16]."

Scientists have extensive expertise and often work in demanding positions. The practitioner allows the scientist to concentrate their energies on their primary role (production and administration of science) by translating science communication research, connecting scientists to audiences, and creating opportunities for scientists to engage publics without extensive customization. Scientific societies can play a role in mobilizing scientists by employing practitioners or connecting scientists to practitioners. Public engagement practitioners are experts in the practice of public engagement: they have expertise in conducting public engagement, can more easily connect scientists to publics, and can support and train scientists for their engagement. Practitioners may also play a role in supporting publics by ensuring the relevance and accessibility of the activities. Practitioners often serve as a bridge between scientists and public engagement researchers by remaining up-to-date about best practices and sharing them with scientists. Practitioners may be science festival organizers, museum