Can Science Communication Workshops Train Scientists for Reflexive Public Engagement?: The ESConet Experience

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Can Science Communication Workshops Train Scientists for Reflexive Public Engagement?

The ESConet Experience

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The European Science Communication Network, between 2005 and 2008, created and delivered original communication training workshops to more than 170 researchers, primarily early-career scientists, to empower them to perform reflexive public engagement activities in various communication situations. The program designed 12 original teaching modules for science communication that not only delivered skills training, including writing for popular audiences and media interview skills, but also developed capacity in, among other areas, risk communication, communicating science in dialogue, and examining controversies within the scientific community. The workshops aimed to encourage scientists to reflect critically on the social, historical, cultural, and ethical dimensions of science.

Keywords: *public engagement; dialogue; communications training; media skills; deficit model*

Creating Workshops for Public Engagement

Demands from governments and funding agencies (European Union, 2002; Pearson, 2001) that scientists should engage with the general public have run up against two fundamental problems:

- there has been little, if anything, in the usual training program for working scientists that prepares them for such activities; and
- other pressures—demands to carry out research, to publish, and to seek grant funding—have left little time for extra training activities.

So can a short science communication training workshop be of any use? Can it do more than deliver narrow media skills training? Can it equip scientists to engage confidently with various nonspecialist publics? Can it motivate young researchers to enter into a meaningful dialogue with interested audiences, while giving them the skills and concepts needed to achieve such complex communication (Trench, 2008)?

The European Science Communication Network (ESConet) has tried to answer these questions in the affirmative. ESConet set out to create workshops that would empower scientists, particularly early-career researchers, to communicate effectively with the mass media, policy makers, and various lay publics, while at the same time encouraging researchers to reflexively analyze the place of science in society and adopt an open attitude to public engagement.

Its aim was to create a curriculum to be delivered in short workshops that would advocate approaches to communication from the current public engagement paradigm (Bauer, Allum, & Miller, 2007). It sought to design modules that would move beyond the skills focused, usually media orientated type of training that is the simplest course, and the kind on offer to the largest amount of people (Miller, Višnjevac, et al., 2008; Turney, 1994).

The project—funded by the European Commission under its Framework 6 Science and Society plan—emerged in a political context where policy makers and funding institutions at national and transnational levels have been putting increased emphasis on public engagement activities (European Union, 2002; House of Lords Select Committee on Science and Technology, 2000).

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Although there has often been a mismatch between the pronouncements of research organizations and the reality of the practical implementation of their public engagement policies (Pearson, 2001), some genuine efforts have been made to equip the scientific community for such public communication. And there is some empirical evidence that scientists who received communication training were more confident in dealing with the media and would be willing to receive further similar courses (Peters et al., 2008; Ruth, Lundy, Telg, & Irani, 2005).

As in most science communication courses historically (Turney, 1994), the members of ESConet have been drawn from several disciplines and professional practices. Network members were leading experts in the field of science communication, with long records of publishing in the area, including seminal books and papers, whereas others were active media professionals with significant practical science communication experience. Some were early-career science communication researchers and professionals actively contributing to their discipline's development. Others had significant experience as policy makers in the area of science and society. Many were full-time scientists committed to public engagement. ESConet was unique in its cross-cultural focus (its members came from 17 higher education and science institutions in 12 European countries).

The program began in the summer of 2005 and, from the start, it explicitly sought to design workshop modules that would equip scientists to operate in the context of public engagement with its "new mood for dialogue" as identified by the U.K. House of Lords (2000), a conclusion drawn after public disquiet expressed after a series of sociopolitical controversies, including BSE and genetically modified foods (Winter, 2004). The House of Lords (2002) report said that this new mood was being equally felt in the United States.

Although operating within this public engagement paradigm, the ESConet program did not have a specific pedagogic aim, such as training the researchers to be civic scientists (Gold, 2001). Its conception of dialogue that underwrote the network's curriculum development was an open exchange of knowledge, ideas, and attitudes between scientists, stakeholders, and decision makers (Jackson, Barbagallo, & Haste, 2005). At the beginning of each workshop, the trainers gave an hour-long introduction, which set out the evolution of science communication approaches and critiqued the shortcomings of the deficit model approach that (as preworkshop questionnaires generally confirmed) was the dominant way that young researchers conceptualized the science and society interaction. The public engagement paradigm was presented as the framework within which ESConet broadly operated.

Creating a Framework for Skills-Based Public Engagement

After its first meeting in 2005, the project's Curriculum Development Committee first began creating the 12 modules[1] that were first trialed almost a year later, in June 2006, in Dolenjske Toplice, Slovenia. It was envisaged that the modules would be able to be adapted, as required, to deliver workshops for young, inexperienced researchers and for more experienced and senior science communicators. Modules were divided into either "basic" or "advanced." Modules were further divided into "practical," which featured practical skills, and "discursive," which focused more on discussing theoretical issues. It was recommended that trainees undertake the basic modules before the advanced options, whether in the same workshop or at different times. Some advanced modules were a combination of practical and discursive work.

The 12 modules and their categories were as follows:

- Who Are You Communicating With, and Why? (basic, discursive);
- Media Writing (basic, practical);
- Talking to the Media (basic, practical);
- How Media Cover Science (advanced, discursive);
- Presenting Research to Policy Makers (advanced, practical);
- Public Science on the Web (basic, practical);
- Hands-On Science (advanced, practical);
- Communicating Risk (advanced, discursive/practical);
- Talking Science and Listening (advanced, practical/discursive);
- Science and Controversy (advanced, discursive/practical);
- The Social Sciences for Science Communication (advanced, discursive/practical); and
- Science in Culture (advanced, discursive).

Creating the practical modules proved to be relatively unproblematic. The participation of several current and former journalists, as well as science information officers, meant that modules on Media Writing, which used press releases as a model for popular writing, and Talking to the Media, which dealt with media interviews, were easily conceptualized. In the workshops, trainers with professional journalistic experience carried out broadcast and print interviews in professional studios where such facilities were available. The practical exercises in these modules were related. Participants wrote a press release on their research and this media statement then was used as the basis of a live interview.

However, creating the advanced modules proved considerably more problematic. The module on Communicating Risk, for example, generated its syllabus from a reading of relevant research in the science studies literature. Designing a practical exercise on this material was more challenging because there was no template to use when producing a piece of risk communication. The eventual risk communication exercise the network settled on as its model was a situation where the participants took the role of risk communication advisors to the Irish government who have to give presentations to key stakeholders—farmers, public health doctors, airport workers—in the immediate aftermath of an imagined bird flu outbreak in the United Kingdom.

Curriculum development for the more discursive, theoretically focused modules was the most challenging for the network. The Science in Culture module discussed core ideas and thinkers from the sociology of scientific knowledge, including C. P. Snow and Bruno Latour, and was deliberately provocative to stimulate discussion. It was usually delivered as a reflective session at the end of a workshop.

Constructing exercises around dialogue issues was demanding. The module Talking Science and Listening presented theoretical material on interpersonal communication skills and active listening, as well as surveying the territory on public dialogue and lay expertise issues. But how could these theoretical issues be translated into a practical group exercise? Here, two real-life events were chosen for role play scenarios: the debate surrounding the seeking of a license to create human-animal embryos in the United Kingdom and the controversy of how to respond to the considerable pollution caused by the sinking of *The Prestige* oil tanker off the Galician coast in Spain in 2002. In these exercises, participants were given extensive background reading material and had to take on various roles, as geneticists, patients, and ethicists or as environmental scientists, fishermen, and local government officials, to seek consensus in these socially sensitive situations where scientific authority was not always the deciding factor.

Setting up practical exercises for the advanced, discursive modules was problematic. As an example, how could the issues raised in the Science and Controversy module, which examined controversies that were mainly internal to science, be developed through group exercises? Because the theoretical part of this module drew heavily on Collins and Pinch's (1998) *The Golem*, the network decided to construct role play scenarios based on two of the authors' historical case studies of "science in the making": the controversy over the 1919 confirmation of Einstein's general theory of relativity (with groups of participants arguing that the evidence was sufficient or

not) and the issue of edible memory in the early 1970s (where participants had to argue whether or not the evidence for the chemical transfer of memory between rats was persuasive enough for publication).

A tension in the curriculum development was how much information to provide to trainees and future trainers. It was decided that the modules were not an all-embracing teacher-proof textbook for science communication. They were not intended as a comprehensive and exhaustive "recipe"; instead, they were offered as an effective model for science communication training. They were aimed at future trainers who had existing educational or professional experience in science communication and would like to train natural scientists and technologists in communication skills. The modules also were targeted at early-career researchers in the natural sciences or science communication who wanted to deliver future workshops of their own, if given some guidance on how to go about it.

So the modules provided a general framework for the workshop content and gave guidelines about how workshops can be delivered in practice, while offering scope for trainers to use their own examples, case studies, lecture structures, and teaching strategies. A key lesson from the ESConet experience has been that the more the content of the modules that can be drawn out from the workshop participants themselves, through group and plenary discussions, the better. The more that trainers can ask key questions that enable trainees to bring their own experiences to bear on the issues of science communication, the more everyone will get from the modules and the workshops as a whole. But training—of necessity—is limited to short periods of time. So participants who undertook one of ESConet's workshops received trainee notes, giving them something to look back on after the warm glow of excitement that these workshops often engender has begun to dim.

Community Building

The network was not conceived as a commercial entity, and its knowledge and experience was shared with the wider professional science communication community. ESConet put on sessions at FEST, Trieste, Italy (Miller, Trench, Jergovic, Koulaidis, & Dimopoulos, 2008), and the international Public Communication of Science and Technology biennial conference (Miller, Višnjevac, et al., 2008). ESConet members made presentations in international forums, such as the European Conference of Science Journalists and Ecsite, the European Network of Science Centers and

Museums, and the American Association for the Advancement of Science, as well as a large number of national and local meetings.

But perhaps the most important community building to have been achieved as part of the ESConet project—which ended officially in summer 2008—was the training of a new generation of young science communication *trainers.* This took place formally at two workshops—in Dolenjske Toplice, Slovenia, and Trieste, Italy. During the Dolenjske Toplice workshop, trainee trainers were first put through an intense delivery of the modules, as if they were researchers being trained. For the Trieste workshop, the new trainers—in their own turn—delivered the modules to their peers and to officials of the European Commission responsible for ESConet. Training new trainers also took place informally, on the job, as the project matured, as more and more of the newer trainers delivered training to researchers from the EC-funded networks being trained. This whole, highly reflexive, experience and the input of this new generation of trainers have been decisive in shaping the modules that were eventually produced.

Does Mixing Theory and Practice Work? Workshop Evaluation

All the modules were successfully implemented at one or more of the nine workshops organized by the network. A total of 173 researchers and trainee trainers attended the workshops, which were divided into three categories. The first category comprised the two training of trainers workshops. The second category comprised the core project workshops: There were three of these that delivered training primarily to researchers from the EU Framework 6-funded networks EuroPlaNet (planetary science), CareMan (health care diagnostics), and QUASAAR (molecular spectroscopy). Finally, four project-related workshops, which made use of ESConet materials, were organized for the following: for Belgian space scientists from universities, industry, and the European Commission; for scientists covered by the Bulgarian and Ukrainian academies of science; and for the Lipgene research network (which examines food science, nutrition, and obesity). After each workshop, the modules were refined, based on how they played out in practice.

The nine workshops delivered in the project were, overwhelmingly, evaluated positively. ESConet is therefore confident that these modules have wide applicability, across the natural sciences and for those engaged in applied and "blue-skies," curiosity-driven research. The three types of workshop were

evaluated separately, in response to a survey that categorized their views on a series of statements about the workshop, classified on a 4-point Likert-type scale.

The two training of trainers workshops were given to 48 trainees in total, most of whom had already some education or practical training in science communication. Their evaluations (with a response rate of 71%) reflected that 62% of respondents "completely agreed" they had "learned new, useful things" whereas 38% "rather agreed" with this statement. Ninety-four percent completely agreed they considered "the whole experience beneficial."

In the three core project workshops, 55 participants were trained, and in their evaluations (with a response rate of 73%), 80% completely agreed they learned new, useful things whereas 20% rather agreed. Eighty-eight percent completely agreed they found the whole experience beneficial. In the project-related workshops, 70 participants were trained, and in their evaluations (with a response rate of 84%), 78% completely agreed they had learned new, useful things whereas 22% agreed with this statement. Eighty percent completely agreed that they considered the whole experience beneficial.

An aspect of the workshop about which participants were less pleased was timing: They felt they did not have enough time to prepare adequately some practical exercises in the workshop.

Qualitative feedback from trainees showed that the method of putting into practice the theoretical approaches outlined in lectures was found to be especially beneficial. The practical exercises were highly valued by trainees. Trainees also reported that they found it interesting to work with colleagues from different cultural backgrounds and varied scientific disciplines. Negative points raised in the qualitative feedback included the timing issue, mentioned above, plus some hostility toward the more theoretically orientated content, although this was by no means a universal complaint.

Further pedagogic observations can be made on the reception of the different types of modules. Participants generally preferred the practical, skills-focused modules. Not only did participants enjoy learning through doing, the related exercises demonstrated practically the theoretical differences between media: Communicating a piece of research on the link between fish oils and depression, to use one example, through different media (print and broadcast), illustrated effectively the differences that varied channels had on a communications effort.

When the curriculum was being created, it was anticipated that the more advanced, and more discursive, modules would be the more difficult ones to deliver, as they did not offer a set of practical skills. This proved to be the case. Indeed, the Science in Culture module proved to be particularly

contentious. Participants, including trainee trainers, found this to be the most challenging module overall, and qualitative feedback found that as many participants found the module intellectually stimulating as believed it was a waste of time that would have been better spent on developing practical skills. Clearly, this form of training will continue to divide trainees.

Other discursive modules were not as divisive. The Who are you Communicating With, and Why? module, which introduced core communication concepts about honing key messages and adapting to audiences, and How Media Cover Science, which gave an overview of science journalists' work, were positively received, according to formal and informal feedback. There was a varied response also to modules that featured a mix between theoretical and practical elements. Risk communication presentations, for example, were of a varying standard: some groups of participants were able to absorb and use basic tenets of risk communication (most crucially, the need to move beyond scientifically quantifiable estimations of risk to address social and cultural values), whereas others struggled, lapsing into the default deficit model form of communication.

Similarly, the exercises in Science and Controversy were found to be demanding, even for experienced science communicators, and were suitable only for participants who had performed successfully in more basic communication situations. Here, the controversy from the 1970s as to whether memory was "edible" was seen as more accessible and engaging by trainees than the historical debates about Einstein's theory of general relativity.

Giving Researchers Opportunities for Public Engagement

Arguments for scientists to participate in public communication activity have appealed to duty (Pearson, 2001). This project found that this was a motivation for participants generally, many of whom self-selected in response to a general call for ESConet workshop participants. These researchers were especially motivated and interested in the training and many had participated in some form of public engagement: largely, talking in schools, presenting at their institutions' open days, and writing for popular audiences.

Yet the motivation for performing this role seemed to be overwhelmingly internal to each researcher: They believed it was a worthwhile, socially important activity. Other researchers were encouraged to attend as part of their work for their scientific networks. Initially, they often had very little idea what public engagement involved but left the workshop with a

positive attitude to public engagement. In this sense, the ESConet workshops clearly *were* of use, at least in the short to medium term. They felt they had learned useful skills, they felt more confident about their abilities to discuss science with their fellow citizens, and they had started on the path of genuine engagement with the public.

ESConet is now embarking on a series of 10 workshops over the next 2 years, in which a multinational team of trainers will take on the challenge of training literally hundreds of researchers at all levels of seniority from countries right across Europe.[2] No doubt the modules will develop further as a result of the experiences of the trainers and the feedback of the workshop participants.

A future challenge—and a potential research area for public engagement scholars—concerns the value that scientific networks and institutions place on practical application of this type of public engagement training. Will early-career researchers receive the opportunities and support from senior scientists to carry out the activities that—judging from this project's experience—they are so motivated to undertake?

Notes

1. Enquiries about access to the ESConet modules should be made to Professor Steve Miller at: s.miller@ucl.ac.uk.

2. ESConet may be contacted via its Web site: www.esconet.org.

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