

**Scientists and the communication of science:
Institutional activities, personal involvement and training needs.
An international survey**

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Abstract

Sissa Medialab (Trieste, Italy) in the last years has offered a various range of short courses to empower scientists, museums staff and other practitioners in science communication. In 2013, in order to develop a new series of courses dedicated to scientists, SISSA Medialab held an online survey that aimed at investigating if and to what extent scientists are involved in science communication activities, what are their interests in this field and what might be their training needs. The invitation to answer an online questionnaire was sent to 1564 scientists who attended the ICTP – International Centre for Theoretical Physics programmes in the last two years. A total of 420 answers were received. In general, scientists expressed a strong interest in participating to science outreach activities: many respondents are already involved in science communication programmes and would like to participate again in the future. Researchers also manifested a need of specific training in science communication – they expressed interest not only towards the improvement of personal skills for delivering lectures or writing, but also for broader topics regarding the relationship between science and society.

Introduction

The last decades have witnessed an increasing effort to establish stronger interactions between science and society. A crucial role in this transformation has to be ascribed to researchers and scientific institutions. At many different levels, engagement with the public is acknowledged as a responsibility for the scientific community, especially for researchers working with public funds (Bodmer, 1985; Wolfendale Committee, 1995; Miller, 2001; Pearson, 2001). The calls for research funds more and more often require the inclusion of dissemination actions and public engagement with science activities (Pearson, 2001; European Union, 2002), and many scientists themselves seem to share the idea that public communication of science and technology represents a responsibility for the scientific community (Wellcome Trust, 2000; Pearson, 2007; Mertin-Sempere, 2008; Andrews, 2005).

Despite the growing importance attributed to scientists' participation to outreach activities, many researchers are still excluded from communication initiatives because of a variety of reasons: lack of time, lack of trust in public ability to understand science, lack of perceived ability to communicate, lack of institutional support (Poliakoff, 2007; Besley & Tanner, 2011; Ecklund, 2012). An additional problem is the lack of specific training, often totally absent in academic curricula and only sporadically offered through specific programmes aiming at empowering researchers to perform various kinds of public engagement activities (Miller, 2009).

In the present research we present the results of an online survey, aimed at investigating if and to what extent scientists are involved in science communication activities, what are their interests in this field and what might be their training needs. The survey was a front-end evaluation for the development of a series of international courses on different areas of the communication of science, developed in collaboration with ICTP – International Centre for Theoretical Physics (<http://jcom.sissa.it/masterclasses>).

Methodology

The invitation to answer an online questionnaire was sent to 1564 scientists who attended the ICTP programmes in the last two years (summer and winter schools,

seminars, conferences). The survey remained online between January 15th and February 12th 2013. A total of 420 answers were received, with a response rate of 27%.

Despite limitations due to the small number of respondents and their possible bias towards the interest in science communication, we consider that the collected answers represent a significant picture of a part of the scientific community: when considering their research area the group of scientists who constitute the sample represents a quite homogeneous community, mainly of theoretical physicists.

All respondents were asked about the involvement of their institutions in the public engagement in science and technology, their current and past personal involvement in science outreach to different publics, their participation in training for science communications and the perception of their needs in this regard. During the analysis we highlighted, when significant, the differences in the responses correlated to the working country or the type of the institution where the respondents are currently working or the role they have in it. The data were tabulated and analyzed using descriptive statistics. Due to space limitations, we only present percentages, but the complete data are available upon request.

Results

Profile of respondents

Most of respondents work in Universities (63%). People working in Public Research Institutes were the second largest group (23%) followed by people working in Governmental Agencies (10%). People working in NGOs, Private Companies and Private Research Institutes represent all together less than 4%. The largest group was composed of professors or associate professors (40%), followed by post-doc/research fellows (31%), senior researchers (18%) and PhD students (10%). Only two respondents were Master students.

The group of scientists recruited for the survey showed a highly international representation, even if some countries were over-represented compared to others (e.g. Italy and Iran). Aggregating the countries by continents, Europe and Asia are the most represented: 161 respondents were based in Europe, 127 in Asia (including India and Iran, that are quite largely represented in the sample). A good proportion of respondents

declared to work in Africa (51) and in Central or South America (56), whereas only 13 respondents were from North America.

Involvement of institutions in the public engagement of science

Science outreach activities seem to be quite common in the institutions where the respondents work: two thirds of respondents declared that their institute was involved in some kind of activity for the public engagement of science (66%, 263 out of 397 who responded to this question).

Many institutions have spaces dedicated to science communication, such as spaces for exhibitions (46%) or didactic laboratories (20%).

Visits to the institute, public lectures and exhibitions are the most common programmes dedicate to pupils and teachers and to the general public. Activities for the schools are altogether more frequent than those for the general public.

The production of materials and media for the public engagement of science seems to be less common among participants' institutions: between websites, books, leaflets and magazines, no single option scored more than 40%, and 30% of respondents declared their institutes are not involved in the production of any outreach material.

Current personal involvement of scientists in science communication activities

Overall, 65% of respondents declared to be personally involved in communication activities. A 30% answered "not yet", and only the 5% stated that they are not and won't be in the future active in science communication activities. The most frequently reported outreach activities are conferences and lectures for the general public (50%), followed by lectures for school pupils (44%). Almost 30% of respondents were involved in teachers' training, articles and books writing for the general public, science workshops for school pupils and educational material preparation.

Future personal involvement in science communication programmes

The majority of respondents would like to be involved in the future in science communication activities: only 3% of respondents declared to be uninterested in engaging in these kinds of programme. Conferences and lectures for the general public

were the choices that received more preferences as future communication projects (61%). Scientists declared to be interested also in conferences for school pupils (51%) and in writing articles and books for the general public (48%) (Figure 1).

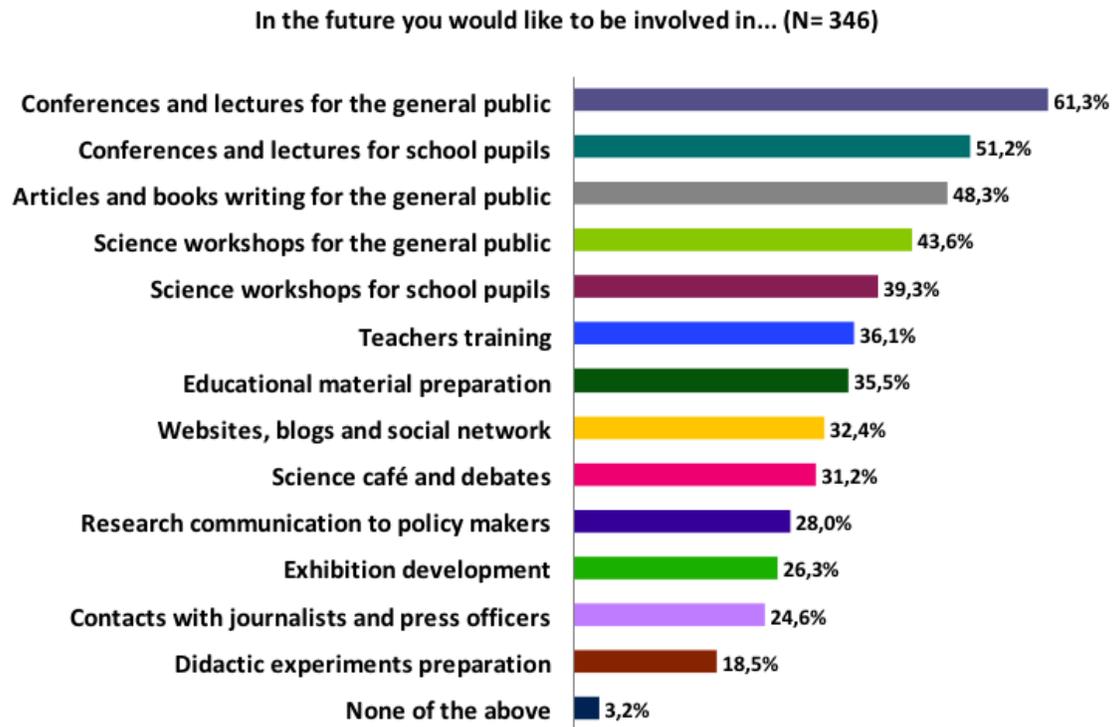


Figure 1

Previous experience in science communication training

Despite the fact that many scientists seems to be already involved in science outreach activities and despite the high interest they manifested in future engagement in science communication, most of respondents have never attended training courses or seminars on science communication (68%).

The age of respondents is a significant variable for the past participation in training courses, with higher percentages of past participation in courses among professors and senior researchers, and lower in PhD students and younger researchers.

Answers differ also when considering the country of work: respondents from Europe showed the lowest percentage of participation to communication courses (17%),

whereas almost half of respondents from Asia, Africa and Iran said they have attended a training course in communicating science.

The small number of answers, and the probable bias towards the interest in science communication of respondents, reduces of course the significance of these results; but a trend to be confirmed with other surveys seems to appear.

Interest in science communication training programs

The majority of respondents answered affirmatively that they would be interested in the future in attending a training course in science communication (65%), and another 27% answered “maybe”: in total the 92% might attend a science communication course if offered. Only 27 respondents (8%) said they were not interested at all in attending a course.

Also in this case, the country where the respondents are currently working seems to be a relevant variable: scientists from Europe appeared less interested in attending science communication training courses: only 45% expressed a clear interest. Scientists from outside Europe manifested an consistently higher interest: 73% of respondents from Central and South America, 73% from India, 75% from Iran, 84% from the rest of Asia and 89% from Africa.

Also the role of respondents seems to influence the responses. Senior researchers and faculty members were more interested in attending a course or a seminar on science communication.

Interest in training topics and in improving communication skills

We asked participants to rate on a scale from 1 to 5 their interest in a list of topic related to science communication and in a list of personal competences and skills that they might want to improve.

When considering together the answers “interested” and “very interested”, the preferred topics were “Public opinions and attitudes on science and technology” (57%), “Programmes and activities for the communication of science” (57%) and “Science museums and science centers” (56%) (Figure 2).

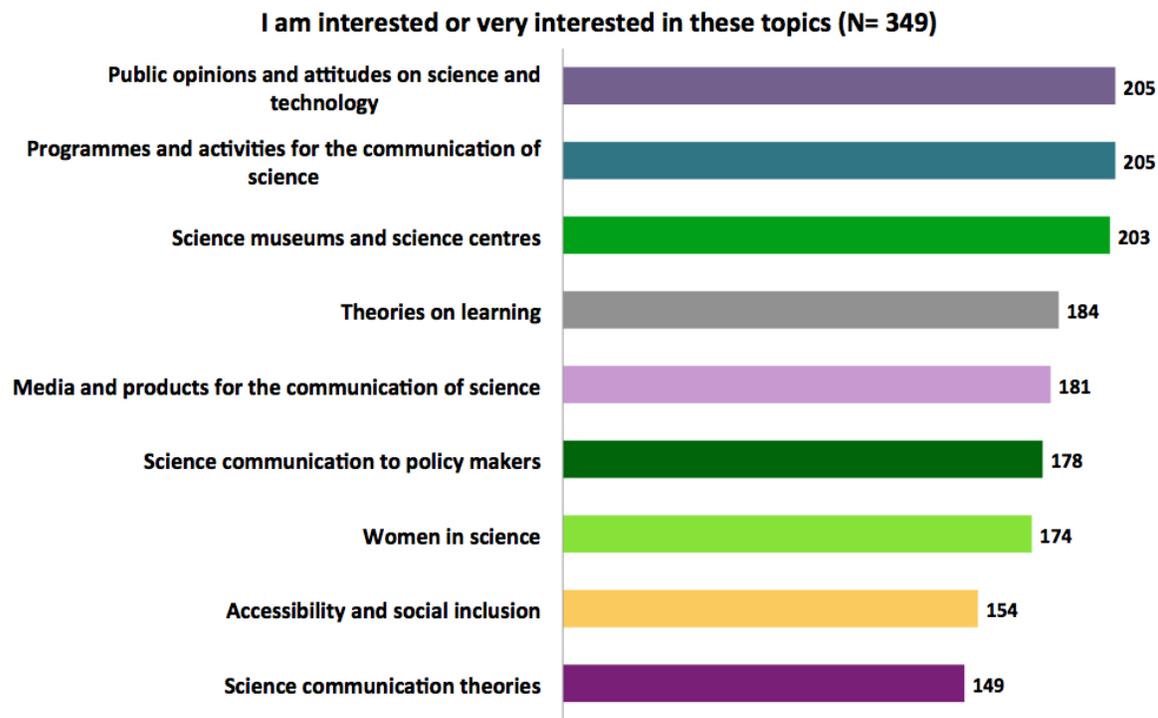


Figure 2

As far as communication skills are concerned, most scientists declared to be interested or very interested in improving their abilities to deliver talks and lectures to the general public (70%) and to other scientists (71%); in learning how to better organize science interactive workshops for different audiences (63%), and in improving their writing skills (64%) (Figure 3).

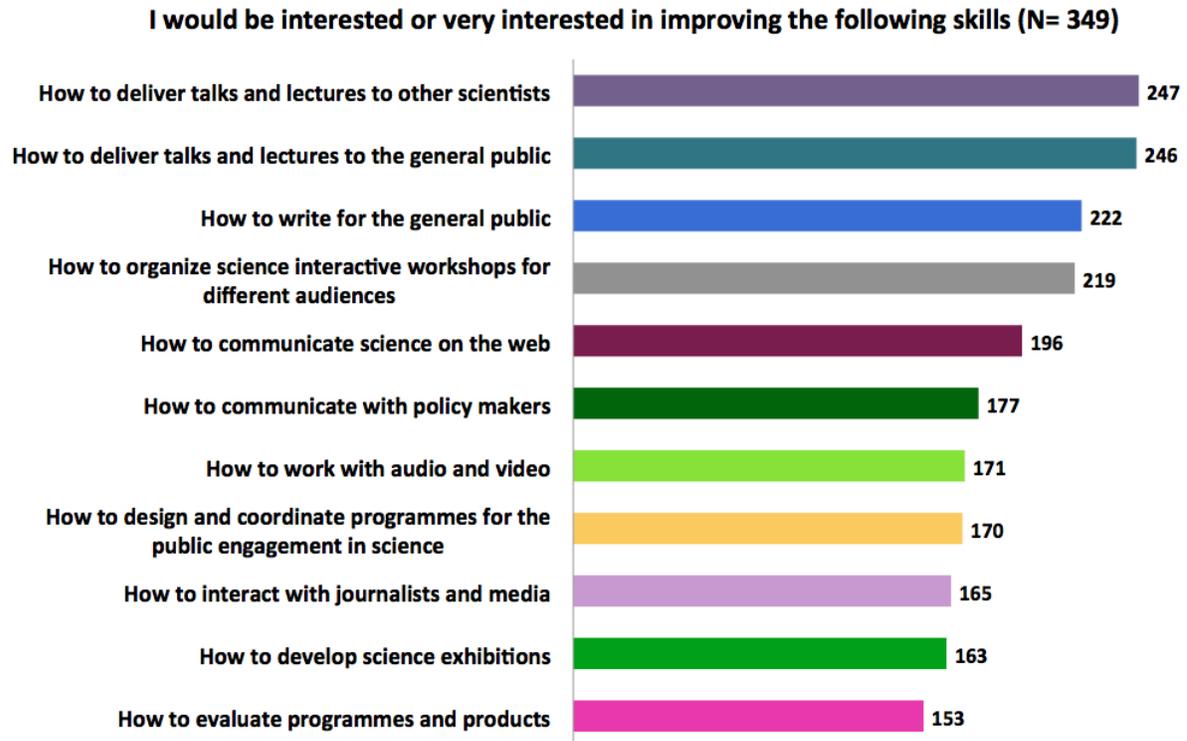


Figure 3

Conclusion

The majority of scientists who took part in our research are already involved in a wide range of programmes to engage the public in science and technology (65%), and a considerable 30% of the respondents who are not involved yet declared to be willing to be involved in the future. The percentage is similar, although lower, than the one found in a large research among a similar scientific community (physicists from different research institutes) in Italy (Avveduto, 2012).

The majority of respondents has not received any specific training in science communication (68%), and would like to participate to some kind of course: 65% of the respondents are surely interested and 27% declared they might be interested, for a total of possible interested people that reaches the 92% of the sample.

Relevant differences can be observed depending on the country of work and the respondent's role inside the institution: non-European, senior scientists are considerably more interested in participating in training programs. This result is consistent with informal observations and evaluation results of Sissa Medialab many international

training courses and with other researches: many young scientists are focused on their career and have less time and interest to engage with the lay public, whilst senior scientists are generally more active in science outreach and more aware of the necessity of the dialogue with the larger society (Jensen, 2008; Martin-Sempere, 2008); scientists from developing countries value more science communication and science education programmes as a way to support the development of their countries, whilst European scientists perceive the same activities as a plus, valuable but not necessary.

The interest expressed by scientists towards skills or knowledge which could improve their ability to communicate science seems to be related to the typology of activities in which they are more active (science writing and oral presentations), but also to more general issues regarding the public engagement in science and technology. High interest was expressed toward “Science museums and science centers”, even if respondents don’t seem particularly keen to be personally involved in developing science exhibitions: their interest might suggest that respondents perceive science centers and museums as a powerful and rich tool to conceive, deliver and promote public engagement in science activities, and therefore would like to know more about how they are established and operate.

Very promising is the fact that 17 respondents left free comments of great appreciation for the survey, manifesting their awareness of the importance of science communication; e.g.: “It’s an outstanding topic wishing all the success for it”; “The idea is very relevant”; “Thank you for giving me the chance to give my opinion”; “The survey is very important, I hope you have it in consideration”.

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