5th International Conference on Public Communication of Science & Technology
„Science without Frontiers - Wissenschaft, Medien, Öffentlichkeit“
Berlin, September 17-19, 1998

Science without Audience?

Qualifying Scientists to Communicate with the Public

By OLAF GAUS and JOHANNES WILDT

„Explain or die: why science can’t afford to keep secrets from the people“. This was the headline of a newspaper article published in the „Independent“. It was a comment on the influential „Wolfendale Report“ published in Great Britain in the autumn of 1995. Written by Arnold Wolfendale himself, the article argued that scientists should present their work to a broader public via the mass media. Thus, Wolfendale aimed at promoting the case for the project commonly called ‘Public Understanding of Science’. He offered three main reasons to support his cause: Firstly, Wolfendale stressed that a strong democracy needs an informed public, a public that can debate the main issues of general concern that arise in science. Secondly, he pointed out that in order to sustain and advance the economic wealth and the quality of life, a modern nation needs trained scientists working both in science and outside of it. If science doesn’t manage to interest young people in scientific careers, this national goal is endangered. Finally, Wolfendale argued that taxpayers have a right to know what publicly funded scientists accomplish with the money allocated for their research.[1]

It is quite obvious that these demands arise while and because the academic world is facing a crisis. This crisis concerns the justification of science in general, and it specifically concerns the financing of scientific research programs. Wolfendale believes that if one wants to improve the standing of science within the public, the public has to be informed by the scientists themselves about the [social] relevance of their work in an understandable way. The method Wolfendale recommended in order to reach this goal is to create incentives for scientists to participate in communication

with the public and to enable them to do so by improving their communication skills. The famous „Bodmer Report“ already summarised this idea in its final words, addressing the scientific community: „Learn to communicate, be willing to do so and consider it your duty to do so“.

There are a number of important questions related to the need of communicating scientific insights via the media. However, since we want to focus on the discussion about Public Understanding of Science in Germany, we would like to concern ourselves with the following problems:

(1) Communication with the public presupposes communication with the mass media. But how can scientific knowledge be converted into formats required by the media? And can scientific results remain scientifically correct after having been transformed into media-ready news?

(2) Scientists are supposed to improve their communication skills. But what are these skills? Do scientists have to write clearer syntax or to learn how to use the rhetorical arsenal? And how could communication seminars or workshops for scientists look like?

(3) [Is the media interested in science news at all?] There are of course other ways for communicating with the public than to use the media. Yet none is more effective. That is why scientists enter a field of fierce competition when dealing with the media. [For its effectiveness makes it a desirable subject for all political, economical and cultural interest groups in a society.] So shouldn’t there be strategies for catching the media’s attention and stimulating interest in science related topics?

In what follows, we will concentrate on the first two question raised. However, we will end this talk with some bright reflections on the last issue.

(ad 1) The question „how can scientific knowledge be converted into formats required by the media?“ is likely to provoke the retort: „Why should scientists deal with the media at all?“. The argument here is that science already has its own

[1] Arnold Wolfendale, How to spread science to the public - the way ahead, in: Physics World 2/97 p11.

specific formats to publish its results, viz. books, scientific magazines [and the Internet]. Publications of these formats are easily accessible to everybody who is interested in science. For one, this argument points out a truism, since publication of course is public. Yet the argument is flawed for some quite substantive reasons. Anyone who claims that 'science books and magazines, let alone Internet websites, are easily accessible to the public' presupposes that these publications are readily accessible to non-scientists. This, however, depends upon various conditions. We would like to discuss some of the relevant issues here:

Somebody who decides to look for specifically scientific literature has already developed a certain interest in scientific knowledge. Otherwise he would not start looking. One could of course presume that everybody has those interests. But that would be naive. As a matter of fact, most adults do become informed about science through the media. Hence, as Dorothy Nelkin[2] pointed out, understanding of science will be based on what the media tells them. This fact is demonstrated by a National Cancer Institute survey in 1984 about how people become informed about ways to prevent cancer. The survey found that 63.6% got their information from magazines, 60% from newspapers, and 58.3% from television, while only 13 to 15% had talked to physicians about cancer prevention (Nelkin, 1987 p77). The survey did not even expect to find a significant rate of people who got their information from studying the respective scientific literature.

Why is that? The gathering of scientific knowledge depends upon a systematic process that has become more and more complex: Topical interrelations only become accessible after reflections on detailed discussions in special fields of research. In addition to that, any recipient needs to make sense of the different linguistic codes which have to be deciphered regarding their semantic meaning in order to gain a deeper understanding. What is more, any recipient must be able to differentiate relevant from irrelevant literature for the special point of interest. He or she must hence have acquired these skills. Finally, any recipient of scientific literature has to know bibliographical methods that allow him or her to search the ever-increasing science literature systematically.

[2] Dorothee Nelkin (1987). Selling Science: How the Press Covers Science and Technology. (New York: W. H. Freeman and Company), p ix.

It thus is evident that lay people who want to inform themselves by reading scientific literature have to be scientific literate. While definitions of scientific literacy vary[3], Jon D. Miller, of the Chicago Academy of Sciences, describes a three-dimensional model of scientific literacy. One dimension focuses on the understanding of the process or approach of science. A second dimension focuses on the existence of an adequate vocabulary for understanding scientific communication. The third dimension focuses on the relationship of science and technology to society. Based on this model, a national survey compiled in 1987 indicated that about 5% of the adult population of the United States meet the minimal requirements for scientific literacy[4]. Miller explains that this estimate was down from an earlier estimate of 7% in 1979. This standard of scientific literacy contrasts rather sharply with a widespread public interest in scientific matters. An extensive study for the National Science Foundation (NSF), which has been incorporated into the NSF's biennial report on national trends in science, also conducted by Miller and published in July this year ,[5] found that 70% of Americans say they are interested in science and technology although there is still a significant lack of understanding. Miller interprets this last finding as a reflection of a „growing public familiarity with scientific ideas, partly as a result of strong science coverage in newspapers and on television."[6]

Our argument thus far was meant to show that science books, magazines and websites are specific publications which are not easily accessible or even understandable to everybody who is interested in science. Since there are many good reasons for scientists to inform a wider public about their work, there hence is no alternative to using the media. Phrasing it vividly, one could say that if scientists renounce to make use of the media, we will be left with a science without audience. This leads us back to the question brought up at the beginning of this talk: How can scientific knowledge be converted into formats required by the media? And can scientific results remain scientifically correct after having been transformed into media-ready news?

---

[3] W.M. Laetsch (1987). A basis for better public understanding of science. Communicating Science to the Pubic. Ciba Foundation Conference (Chichester: John Wiley & Sons), p 3.
[4] Jon D. Miller (1987). Scientific literacy in the United States. Communicating Science to the Pubic. Ciba Foundation Conference (Chichester: John Wiley & Sons), p19.
[5] Collin MacSwain (1998). US public puts faith in science, but still lacks understanding. Nature 394, p107.

The presentation of complicated topics concerning scientific research in the media will of course be beset with grave problems. Scientists, promoting their notion of 'correctness' from a scientific point of view, and journalists, sporting their idea of a 'good story', are hard pressed to compromise. However, we would like to ignore the often explored issues of the well-known tensions between the two cultures of science and journalism[7]. We would rather like to highlight common interests both parties have in feeding the public with science related topics.

Let us provide an example: When Sir Arnold Wolfendale, who is [Immediate Past President of the Institute of Physics and] emeritus professor of high-energy astrophysics at Durham University [in the UK], wrote the article on his own report, he was astonished how science editor Tom Wilkie headlined: „Explain or die: why science can't afford to keep secrets from the people". It's hard to imagine Wolfendale himself picking such a sloppy headline. For it by no means considers the subject of PUS, the very subject Wolfendale wrote about. It rather tries to give it a dramatic touch by reducing the future of science to only two options. Moreover, although the first sentence is remarkably short and therefore significant, it is all but precise: It is not the case that scientists do not explain their subjects. The problem rather is that the sort of explanation genuine to science is not suited for a public understanding. The second sentence also lacks precision and therefore furthers the misunderstanding: „Science can't afford to keep secrets from the people" accuses scientists of intentionally not revealing important discoveries. This implies that scientists are actually keeping results secret in order to profit from them. However, this is contradicted by a rule everyone seriously interested in an academic career has to adhere to. This is the iron rule of 'publish or parish'. Hence, since scientists are always interested in increasing the number of their publications, they are as a matter of fact anxious to reveal their 'secrets'. The core of the real problem Wilkie tried to hint at is the reality of a society that increasingly depends on people working in science-related jobs, people who are interested in sharing scientific knowledge without necessarily being experts themselves. Especially these people expect

[6] Collin MacSwain (1998).
[7] Dorothy Nelkin (1987)

scientists to use easily accessible media and to inform the public in an understandable way by ‘parsing’ their specialised linguistic codes.

After having focused on the question why scientists are expected to present their results via the media, it is inevitable to reflect on how they can do so successfully (ad 2). According to the findings of the „Wolfendale report“, there is scope to improve scientists’ communication skills. But what sort of ‘skills’ are required? Communication skills are to be regarded as a useful instrument that helps scientists to communicate their topics at the interface between of science and the public, especially when dealing with the media. This includes the task of converting scientific insights for target groups outside one’s own scientific discipline, thus embarking on ‘expert/lay communication’. To our mind, the decisive point in this context cannot be to provide scientists with ordinary rhetoric lectures. It rather is helpful to create and offer suitable ‘Assisted Learning Arrangements’ that instil communication skills such as rhetoric means of journalistic writing and talking with all its requirements of witticism, vividness, and educational reduction. This enterprise of course faces the problem mentioned of how to convert scientific knowledge into formats required by the media.

The experiences we made from two workshops at Bielefeld University titled „Journalistic writing for scientists“ and „Broadcasting for scientists“ show that it is necessary for scientists to know more about various media-formats as well as the language the media accepts for the presentation of scientific topics. Both, the media-formats and the language, are forming a coherent structure. It is of great importance for scientists to have detailed information about the criteria the media uses if they want to reach the wider public through the media.

Science editors at newspapers, broadcasting or television stations usually deal with single scientists when they need an expert’s assessment of a subject. In this case, it is always the journalist who plays the active part: He decides what the interesting subject is, it is him who selects the expert, and he finally defines the role the expert is expected to play. Metaphorically speaking, the relationship is this: The journalist writes the scenario, acts as stage-manager and produces the performance. The scientist on the other hand gets assigned the rather passive part of an inexperienced actor. That this is the prevailing situation is probably one reason why many scientists

have reservations concerning the media. This being so, one is tempted to ask why experts who 'appear' in the media nevertheless accept this role. This issue was recently pursued by the French sociologist Pierre Bourdieux[8], who published two essays „Sur la télévision", where he wondered why this problem is not widely discussed among scientists and journalists.

There are few courses for scientists designed to familiarise them with how to get information about the media, what the restricting conditions of the various media-formats are, and what 'time or space limits' are common for certain topics. One we know of is a workshop called „Mediatraining" which is held regularly by Winfried Göpfert, chairman of this „PCST-conference" at the „Forschungszentrum Jülich" in cooperation with Hans-Peter Peters and others. They concentrate on what scientists should know when dealing with television in an expert's role.

In our workshops already mentioned, we tried to find out whether scientists can play an active role in dealing with the media. We wanted to determine how scientists can acquire professional journalistic skills enabling them to create media-ready products such as news, stories, and features for papers or the radio. There certainly is a demand for such an education. On the one hand, we regularly encountered remarks like this from young scientists : „I feel that some aspects of my present research might be of interest to the public. However, I have no idea if it is also of interest to the media, and I just do not know how to present it." On the other hand, we interviewed ten science journalists working for nation-wide newspapers and broadcasting stations in Germany. We asked them how many articles they were offered by scientists per year. The result was startling: They unanimous reply was that being offered an undemanded paper written by a scientist is very exceptional indeed, yet most of them appreciated these offers. However, they all complained that the papers offered were being presented in science-formats, and they all criticised the received essays as being too long and too hard to understand to be published. To edit such papers for the media, they agreed, would take too much time and effort.

This result makes the problem more transparent: As long as scientists do not succeed in transferring their texts into prose adhering to journalistic standards, they

[8] Pierre Bourdieu (1998). Über das Fernsehen, (Suhrkamp Verlag, Frankfurt am Main).

will not be able to use the media for a better public understanding of science. In this context, it is apt to quote Rainer Flöhl, one of the most famous science-editors in Germany, writing for the 'Frankfurter Allgemeine Zeitung'. Flöhl recently confessed: „Science-editors need the help of scientists. By themselves, they cannot achieve an overview, since the matter at hand is very complex. For that reason, scientists should play a more active public role".[9]

This explains why science-journalist are increasingly interested in co-operating with scientists. However, are there any incentives for scientists to „share intelligence" with the media? We think that there are. In our workshop, we experienced that the process of rendering a science-related text understandable for the public by using journalistic formats advances the self-understanding of scientific problems for the scientists themselves. The process of journalistic text-editing and the need to address different target groups generates insights concerning the intelligibility of one's writing. An additional aspect is that our participants began to recognise that there is an interrelation between what they do in their highly specialised fields of research and what can be presented without leaving a common basis of understanding. Reflecting on one's research from this common basis means to be able to determine the relevance of what scientists do. This might help to advert the complaint that science is not incorporated into society. What is more, we think that acquiring the skills mentioned can by itself be understood as an incentive for scientists to communicate with the public.

As to the layout of the workshops mentioned, we would like to provide some ideas concerning the setting and experiences we made. Right from the start, we had the idea that we would not only want young scientists to learn about journalistic formats and language from experienced science-journalists. We wanted both parties to profit. That is why we incorporated into the seminar discussions on the topic of „sharing intelligence". We would like to show this in some greater detail, concentrating on our workshop titled „Journalistic writing for scientists". This two-day-workshop aimed at getting information about various formats existing in the print media and why the format-criteria among these publications differ. We had 25 scientists from the universities of Bielefeld and Dortmund participating in this workshop. They were

[9] Rainer Flöhl (1998). Wissenschaftsberichterstattung in der Presse. Freiheit der Wissenschaft 2, p1-2.

advised by six science-journalists from national and regional newspapers. The scientists had been asked to bring a text of their own on a topic of their research they deemed to be of interest to all participants. These contributions covered the whole area of academic disciplines, ranging from issues in the social sciences to questions in the technical and natural sciences. We then had plenary meetings where participants discussed why even print media-products are very different from each other, for example in developing specific formats. In addition to that, we organised five tutorial-style working groups, each being directed by one of the official advisers, except for one group with a co-advisor. Equipped with the results of the plenary discussion, the participants deliberated with their respective advisers on which journalistic format would fit which of the submitted texts. The participants then transformed their texts, altering the language and format to mould them into journalistic categories such as short news, features, reports and even commentaries. The products aimed at were supposed to be „ready to publish“. Some of the resulting texts were then presented by the advisers at the last plenary meeting. The criteria of journalistic quality were discussed again, and so was the process of converting a text from a science format to a journalistic one.

An evaluation of this workshop gave evidence to the fact that the criteria concerning the quality of journalistic writing can be learned. Most participants came to the conclusion that journalistic skills help them to even gain a better understanding of their own research. While at the beginning of the interdisciplinary working groups nearly none of the participants had an idea what the texts of his and her colleagues were about, the journalistically shaped text versions brought ‘enlightenment’. 19 of 25 participants who answered the questionnaire said they had never published in the media. Six of them had a little experience on that subject. 14 out of 25 participants were convinced that measures to qualify scientists to communicate with the public via the media should be a mandatory part of any scientist’s education. Ten of them thought these measures should be available for scientists who are individually interested in this. Only one person believed that there would be no need for a special qualifying. The questionnaire also asked the participant of this workshop if they have, in the course of their academic teaching, to present scientific topic in a generally intelligible way. Astonishingly enough, only 3 person of 25 asserted that they do not.

Nine persons admitted this would sometimes be necessary, and 13 persons answered this would be regularly necessary.

The questionnaire also asked for suggestions as to which subjects could be interesting for further workshops designed to give a broader basis for an understanding of what Public Communication of Science deals with. 17 out of 25 participants said that they were interested to learn more about using the Internet for popular writing. 15 out of 25 participants would like to discuss methods used in public relations in order to employ these as tools for science-marketing, for example to organise and promote conferences, as well as for shaping the scientific profiles of their faculties. 16 out of 25 participants would welcome the offer to receive training in giving talks in order to address especially a lay-audience. Still, 11 out of 25 participants thought it important to learn more about concepts of fund-raising in order to finance their research in addition to a public funding.

All 25 participants said they were interested in joining future workshops concerning these topics. 22 of them thought that it would also be useful for their colleagues to take part in this, too.

This data quite obviously does not generalise to a general picture. It evidently does not show that a majority of scientists believe that there is a need to offer qualifying workshops to learn how to communicate with the public. Yet we think that it does show that there is an increasing interest among young scientists to be involved in public communication of science. The evaluation of our second workshop „Broadcasting for Scientists“ confirmed this assumption.

(ad 3) We would like to end with some remarks on catching „the media’s attention and stimulating interest in science related topics“. As Rainer Flöhl pointed out, „Science-editors need the help of scientists“[10]. However, one has to add that this also holds in the other direction. What we witness is a convergence of interests. The increasing complexity of knowledge and its relevance to political and economic decisions makes it necessary for both sides, science and the media, to create new and better formats in order to make the public understand. An example of such new

formats may be provided by four programmes recently screened by the BBC that examine the BSE crisis in some depth. These programmes cover not only research done in the United Kingdom. As Denis Loveridge reported on the very first PUS-Cyberconference in February, these programmes rather aim at giving a comprehensive picture of world-wide research on the disease. Loveridge stressed that this series is but one of many programmes screened by the UK television companies on issues that involve science. And, most important, he thinks that these programmes „typify what seems to be a growing phenomenon of 'media science'".[11]

At this point, we would finally like to quote the conclusion Pierre-Marie Fayard, who founded the PCST International Network in 1989, arrived at in his talk titled „Towards the Sharing of Intelligence". He held this talk at the fourth International PCST Conference in Melbourne in 1996. His thesis was that „the new compass for communicating science to the public might be called 'shared intelligence'. (...) Though the written material remains the first vehicle for communicating science to the public, the spread of specific services will be reinforced by the features of the information society. One can bet on that direction to provide new services for the public."[12] From this it follows that there actually is a need for scientists and journalists to embark on joint ventures in order to create new media formats. Such a process of 'sharing intelligence' would depend on learning about the crucial criteria both scientists and journalists adhere to when they justify the respective media formats they are using traditionally. Workshops, like the one we described above, can be regarded as an effective means to get this process of 'sharing intelligence' off the ground. However, we think that much more has to be done. Maybe it is not true that scientists have to, as Tom Wilkie put it, „Explain or die". Yet even the most traditional science does not want to be without audience.

Bielefeld, September 16th of 1998

---

[10] Rainer Flöhl (1998)

[11] Denis Loveridge (1998). Http://www.counterbalance.org/cgi-bin/p...oject&Mid=42-4&SL=1+2+3+4&sort_by=Topic

[12] Pierre-Marie Fayard (1996). Towards the Sharing of Intelligence. Historical dynamic & Current trends of Public Communication of Science & Technology (PCST) in Europe (unprinted paper <?> discussed on the IV. International PCST Conference, Melbourne, Australia, November 1996).

Authors:

OLAF GAUS M.A.

Universität Bielefeld
Interdisziplinäres Zentrum für Hochschuldidaktik
Universitätsstrasse 25
33501 Bielefeld
Germany
Phone: 049 521 106-4692 (Office)
Handy: 0171 19 20 44 7
e-mail: Olaf.Gaus@post.uni-bielefeld.de

PROF. DR. JOHANNES WILDT

Universität Dortmund
Hochschuldidaktisches Zentrum
Vogelpothsweg 78
44227 Dortmund
Germany
Phone: 049 231 755-5531 (Office)

e-mail: jwildt@hdz.uni-dortmund.de