

I WANT TO BE A SCIENCE COMMUNICATOR: A 10 YEARS TRAINING EXPERIENCE IN SCIENCE COMMUNICATION

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Abstract

Science communication is becoming more and more important every day. Citizens are interested in science and particularly in that science affecting them the most (health, environment, technology). So science communicators have adopted a prominent role in the society of knowledge as mediators between scientists and general public.

The objective of this paper is to show the general skills required to be a successful science communicator; show up the strategies to reach them from a real experience carried out in Barcelona and finally show up the main debates and reflection being considered around science and society to provide students with a critical point of view useful to tackle controversial issues.

This project, sponsored by the Instituto Novartis de Comunicación en Biomedicina, is a 10-year-old experience master degree in Science Communication run in the Continuing Education Institute (IDEC) at the Pompeu Fabra University, which includes specific satellites around it providing students with a specialization on Science on TV, Science Museums or Medical Communication. The Masters has a theoretical part aiming at providing a background on science and society, on ethical issues related to science communication and in short to create a critical opinion. The practical background is made up with different projects: writing and oral communication workshops, radio and TV workshops, a web-based international project, an internship in a company or institution and a final project. It tries to give a comprehensive view of science communication, science in society and the practical skills to develop a career as science communicator.

Keywords: science communicator, training, science & society

Context

As the European Network of Science Communication Teachers (2003)¹ already stated all across Europe, there are concerns that relationships between scientists and the general public have reached crisis point. A breakdown in trust is being talked about as the results of the last Special Eurobarometer² published in January 2005 show. According to this Eurobarometer, 45% of Europeans feels they are neither interested nor informed about science and technology and two thirds say they are badly informed. For example, the European Commission's Science and Society Action Plan states: "... there are indications that the immense potential of [scientific and technological progress] is out of step with European citizens' current needs and aspirations, such as peace, jobs, security and sustainable development of the planet." Policies to deal with this perceived problem are being pushed ahead, both at national level and on a pan-European basis. These policies make increasing demands on scientists—to communicate, to be involved in public dialogue and debate, to make science part of an integrated culture—demands for which they are poorly prepared by their formal training. At the same time, there are new pressures on the media as the channels of communication through which the public gains an insight into science and technology. The demands on journalists and broadcasters are also mounting—they should be more knowledgeable about science but less involved; they should be more supportive and more critical.

While these developments have occurred, independent of them social, historical, and cultural research has shown that the real relationship between science and society and between scientists and the public are infinitely more nuanced and complicated than most politicians and leading scientists have ever imagined. Yet all too often, the findings of this research have passed unnoticed when policies to "improve the situation" are being developed. In several countries of the European Union, universities and colleges, as well as private consultants, have developed courses to train scientists and communication professionals to help them deal with the increasing demands of this new social contract. These range from essentially vocational courses to programs in science and technology studies that include history, philosophy, and sociology of science. But rarely have those delivering them shared the experiences gained in these courses.

A bit of history

The Master in Science, Medicine and Environment Communication³ started in 1994 at the Universitat Pompeu Fabra in Barcelona with a postgraduate degree in science communication. Vladimir de Semir, Director of the Masters was the promoter of this initiative when he was working as scientific journalist in the well-known Spanish newspaper La Vanguardia. From his professional experience he realized there was no specific training in the area of science communication and he noticed the need to provide professionals both scientists and communicators with a background on science and society, on ethical issues related to science communication and in short with a critical opinion, together with practical skills to communicate with the general public. The initiative was well received to such a pitch that course has an average of 30 students every year, that means more than 300 students have been trained as science communicators.

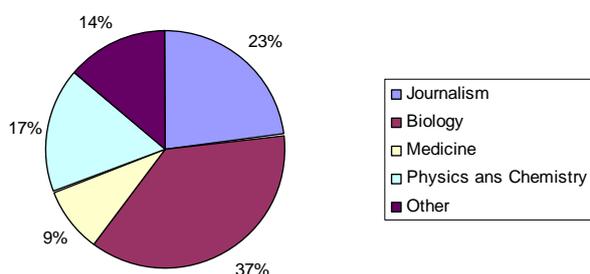
Target public

The Masters in Science Communication is addressed to any person interested in science communication no matter which is his/her background. That means the background of the students is very different ranging from biologists, physicists, physicians, chemists to journalists, philosophers or linguists among others.

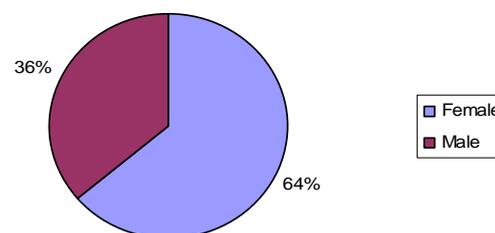
This heterogeneity is intentional as we think the different backgrounds mean different ideas, different ways of approaching subjects, controversies, different skills when tackling a situation, and all these features result in a global enrichment for all, trainees and trainers. In addition to that we run away from the idea that a good science communicator must be a scientist or a journalist, as we consider a person with a critical point of view, who knows which are the information sources, who has skills to communicate in a simple language that can be understood by the general public and who is creative can successfully assume the tasks of a science communicator.

The following graphics show the figures of the different background education of our students and also the gender and age distribution (2005):

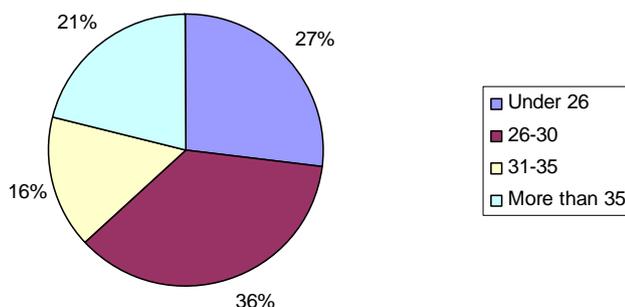
BACKGROUND EDUCATION (2005)



GENDER DISTRIBUTION (2005)

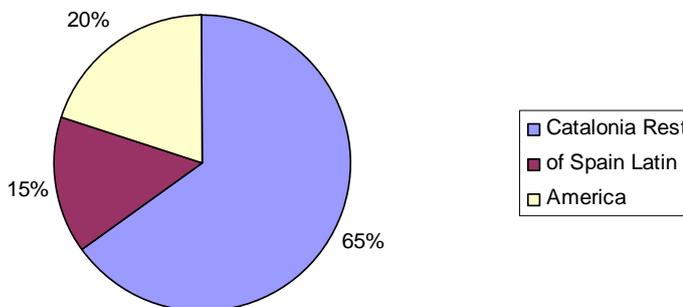


AGE DISTRIBUTION (2005)



UPF Masters in Science Communication has also received students from all over the world, mainly from countries of Latin America, probably due to the fact the main language of the course is Spanish, and in some classes English. In the last two years (2004 and 2005) the masters has also received students from USA and Europe (Belgium and France). During the following years it must be seen if it is a tendency that grows up.

GEOGRAPHICAL ORIGIN (2005)



Master in science communication structure

The Masters in Science Communication takes a year and is structured in three main modules although some parts of the modules must be explained together with some other parts of other modules as the science communication is so interdisciplinary:

- Module I. Science Communication
- Module II Medical Communication
- Module III Environmental Communication

Module I. Science Communication

The context of science communication

This module includes an introduction to science communication, history of science and the context of science communication. Then it focuses also on the scientific discourse analysis, which includes the study of the scientist voice, the analysis of terminology, the strategies of scientific discourse, etc. The mass media are also tackled in this first module, together with the reference journals, paying special attention to the process of preparing a news item, from the scientific paper to the media. Tools used by the science journalists are deeply analyzed in our courses as from our point of view it is more important to give tools to the future science communicators.

Public Understanding of Science (PUS) is also tackled in the first module of the Master, focusing in the main sub areas of the programme, medicine, environment and other sciences. To do so, case studies are used in order to put students in a real situation and ask them to approach an event from the perspective of the communicator.

Writing is another of the main subjects of this first part of the Masters. Daniel Cassany, expert in training students in science writing collaborates in the Masters from the very beginning. This is one of the best-assessed subjects as it is useful for both scientists and journalists. The workshops organized by Cassany try to make students feel comfortable when writing through the practice, and provide them the necessary tools to write in a simple way, easy to understand but with very extensive literary resources.

The professional of science communication

In this part students see the different posts they can reach as science communicators, from a PR department in a research institution or a hospital, to a counsellor in the Government. Real professionals from these areas come to the Masters, tell their experiences and prepare a workshop with a real case study. The use of case study as a pedagogical tool is very frequent in the UPF Masters as it is considered one of the best ways to reach a balance between theory and practice.

Science communication centres

This sub area focuses on the communication in science centres and science museums. It includes visits to Catalan Museums such as Cosmocaixa, the Barcelona Museum of Natural Sciences, etc. Students receive some theoretical guidelines on how science can be explained in museums and exhibitions, how it should not be told and which are the new trends. One of the tasks required in this section is to prepare a project for an exhibition. Students have to think on the discourse, the ideas they want to communicate and how they could do it.

Scientific information on the written press, radio and TV

Students are shown the different media (TV, newspapers, internet) from different countries specialised in science or that devote an important part of their space to science. Professional journalists give lectures and workshops on real cases (mad cows, space travel, cloning, etc). Journalists participating in the course are from media that have different ideologies and history. It is important to point out this feature as it helps students to see which can be the different context situations that can affect their tasks when working for media.

There is a special workshop on radio, where students after being given the main guidelines on how radio works, the language that must be used, the importance of sources, the trust on them, the need to set a very good relationship with them among other things, have to prepare a radio programme on science.

The relationship between scientists and communicators

Students are told about communication in big research centres (NASA, CERN, CSIC, etc.); institutional communication in universities where communicators have to establish a relationship with researchers; the evolution of reference science journals; the influence of pressure groups (Greenpeace) in journalism.

The future of science communication

Present and future of scientific publications; the electronic publication of research projects; tailored distribution of scientific information; social expectations on science communication; prospecting analysis of the biology, physics, chemistry, environment and medicine research and communication, etc.

Practical work

The Masters programme tries to find a balance between theory and practical work. Thus there are three main ways for students to put into practice what they have learned:

- Workshops during the course
- Training period
- Final project

Workshops

During the whole course, students have different possibilities to put in practice the theory they have been taught. For instance, they have to write a script for a short audiovisual project, then take the cameras and do the field work, and finally edit. This practical work is framed in an international project led by the University of New South Wales in Australia, in which our students participate since 2004, the World Wide Day in Science. The final video must be uploaded in the WWDS website⁴ together with texts and pictures they have also prepared to show for instance how is the day of a scientist doing research on stem cells and who has 4 children and likes singing opera.

Furthermore, students are also asked to write articles every two weeks, analyse articles published in the press or documentaries on TV, follow up press releases from Nature or Science, attend conferences and write a report on them, etc.

Training period

Students must follow a training period, unless they are already working as science communicators. The period can range from 80 hours (approximately one month) or three months, part-time. Students select the institution or company and the activity they want to develop. So it is a tailored internship for each student.

We can offer a wide range of possibilities:

- Communication Department of a hospital (e.g. Hospital de Sant Pau, Hospital Clínic, Hospital del Mar)
- Communication Department of a university (e.g. Universitat Autònoma de Barcelona, Universitat de Barcelona)
- Newspapers and journals (e.g. El Mundo, El País, ABC, Muy Interesante)
- Publishing house (e.g. Rubes editorial, Prous Science)
- Research centres (e.g. CERN)
- Museums (e.g. Cosmocaixa, Museu de la Ciència i la Tècnica de Terrassa, Deutsches Museum, Exploratorium de San Francisco)
- Pharmaceutical companies (e.g. Novartis, Roche)

- TV production companies (e.g. Smartplanet, National Geographic)
- ...

We also offer students, who want to do an internship but are working, the possibility to participate in research projects or other projects that do not require working in the office (e.g. *Informe Quiral* a report about science in the Spanish press).

Final project

During the whole course, students have to work on their own in a project that they have previously chosen. Among the different possibilities there are:

- Research projects (e.g. science in the press, radio or TV, science education at school, science in the cinema etc.)
- Projects of exhibitions, activities for museums, etc.
- Communication projects (e.g. communication plans in crises situations)
- Science writing (e.g. a book on physics for children)

This final project aims at offering students the possibility to go more deeply into that area they are really interested or they want to explore more. It is a chance also to open new horizon and think of the project with future applications.

The last week of the Masters, students have to present orally their projects in the class. The instructions they receive for the presentation focuses in different aspects: verbal and non-verbal communication, format of the presentation, clarity in explanations, length of the presentation, etc.

As for the global evaluation of the project the following aspects are assessed:

- Selected project: if it is original, the topic had not been analysed before (in a research project), it tackles a subject that has to do with current affairs
- Methodology and structure of the project
- Formal presentation and accuracy in writing

Evaluation and feedback

In our Masters degree evaluation is carried out during the whole course. Students must fill up questionnaires every two weeks evaluating the lecturers they have had in the previous classes. However we are aware this is not enough and some students may not fill up the questionnaire, that is why we offer them the chance to exchange opinions with the direction and more specifically with a figure we introduced 4 years ago, the tutor. The tutor is closer to students and sets up a relationship with them that allow students to make suggestions and to give their own view on the contents of the Masters.

It is important to point out that every year students have different interests and different expectations, that is why after the three first months of class we informally talk to them in order to find out what they are specifically interested in. This helps to adapt the classes to students' expectations and going more deeply into those areas they are more interested in.

As mentioned above the final project is assessed by the professorship, depending on the area they are specialised. The final project provides us a global view on students' expertise and the skills they have acquired.

Satellites of the Masters in Scientific, Medical and Environmental Communication

The Masters in Scientific Communication has different postgraduate courses, which complement the Masters:

- Science documentaries on TV
- Medical communication
- Scientific museology

All these three programmes aim at providing students with a specialisation in the particular areas of TV, museums and medicine. They were created as a response to the demand of students that wanted to go more deeply in these areas. The courses on TV documentaries and on museums are even more practical than the Masters in Scientific Communication. Students have to do also a final project which must be real, that means they have to make a documentary and a project for a real museum.

The Postgraduate Course in Medical communication is different from the other two courses, as it is mainly online. Students have only one week of classes and the rest of work is made at home and delivered using a virtual space provided by the Universitat Pompeu Fabra.

This initiative was carried out because there were students from other regions of Spain that could not move to Barcelona but wanted to specialise in medical communication. So the Postgraduate Course in Medical Communication tried to cover this gap in medical communication training in Spain. Up to now, this programme has been run twice in Madrid, once in Galicia and the next edition is due in October in Granada.

- [1] The ENSCOT team, *ENSCOT: The European Network of Science Communication Teachers*, Public Understanding of Science, vol 12 pp. 167–181, 2003
- [2] Directorate General Research, *Special Eurobarometer 225. Social values, Science and Technology*, European Commission, Brussels, January 2005
- [3] <http://www.upf.edu/idec/oferta/mcc.htm>
- [4] <http://www2.science.unsw.edu.au/worldwide/index.html>