

Science and society in *Ethics and Polemics*

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The results and observations achieved by the *Perception and Awareness of Science – Ethics and Polemics* Project in the last two years and collected in the first part of this book, bear witness to the activities of our research group¹ aimed at *encouraging and observing* the encounter between a society and a science which are both ‘complex’ (Funtowicz, Ravetz, 1999) and in continuous evolution (Latour, 1998).

What is *complex* need not be considered also or necessarily *difficult* or *distant*: complexity implies a wealth and articulation of points of view, which are vital elements of the social debate and, above all, catalyse the debate among scientists. Yet, there is no trace of complexity in text books (Caravita *et al.*, 2008) and young people are presented with a watered-down version of science, lacking its dynamic, conflicting components, or even with science in pills, removed from its original context and with no reference to its application or multidisciplinary aspects.

¹ The institutes Irpps (co-ordinator), Ceris and Irea of the Italian National Research Council, the British Council and the Italian Civil Protection Department are partners of the Project *Perception and Awareness of Science – Ethics and Polemics*. This is a project of the Cnr Research Unit *Science Communication and Education*, http://www.irpps.cnr.it/com_sci/. From this website it is also possible to download the book *La scienza dagli esperti ai giovani e ritorno / Science: from specialists to students and back again*, ed. A. Valente, Roma, 2006, that includes the results of the first years of the project activity in the fields of GMO, “Electrosmog” and Space exploration, in the schools of Bologna, Naples and Rome.

Bringing into schools the wealth and articulation of the scientific debate, including the «unavoidable uncertainty» (Trench, 2008) of science, which is the foundation and fuel of the scientific method (Falchetti, 2007), in order to encourage a process of study, participation and exchange of opinions between young people and experts was the main goal of the *Perception and Awareness of Science – Ethics and Polemics* Project. The process was based on the creation of study and discussion groups in the lower and higher secondary schools of Rome and Milan and on the organisation of a round table and a conference including a political debate, with parallel events in each of the cities involved. During these events, students, experts and their audience exchange ideas on the central topics of the scientific debate on the water crisis and on climate change, on the economic, social, environmental and ethical consequences.

Creating spaces and establishing processes to *encourage* and enhance the meeting and exchange of opinions between science and society is something like building arenas, in the sense indicated by Bonneuil, Joly and Marris, of «sites where individual and collective actors interact to define the cognitive and normative dimension of a problem» (Bonneuil *et al.*, 2008).

In these sites, in these communication arenas, researchers, teachers, tutors, students and experts are all part of the process of change, and the site itself is modified through collective contributions. This is why the methodology² followed by the project over the years has always distanced itself from the original design carried out in the year 2000 and is more and more oriented to enhancing the participative aspects described in the second chapter of the book.

In carrying out a further study on the issues connected to the water crisis we began with the infinitely small, the tacit knowledge of each student on the topic, to arrive at the international debate

² The methodology of the *Perception and Awareness of Science – Ethics and Polemics* Project was selected and included as one of the two Italian Best Practices by the European *Form-it Take Part in Research* Project, which analysed 160 research and education cooperation projects (REC), with the aim of «creating a set of quality criteria and guidelines to carry out research and education cooperation projects and to produce policy documents for decision-makers».

with Italian and British experts. The core of the process is the study of the scientific documentation selected by the Cnr (described by Luciana Libutti in the *Information and education* essay); indeed, participation cannot do without commitment, and the logic of understanding can be overcome only by integrating it into the new science communication models (Valente, 2006), taking note of the «simultaneous coexistence of different patterns of communication» (Bucchi, 2008).

A strong motivating force for students in their journey to gain an opportunity to take part in the scientific debate was the institutional collaboration with the experts of the Italian Civil Protection Department, who assisted the teachers as tutors in the study stages and in paving the way for a first debate with the classrooms.

The project's attempt to propose and test various communication models was combined with the intent to *observe* the situation in which the work was being carried out, in view of better understanding it and increasing the awareness of all participants: to this end, two questionnaires to check the perception of the water crisis and the understanding of the values of science were given at the beginning and at the end of the communication and training process.

The approach and main results of this survey are described in the third chapter of the book.

The comparison between the answers given in the first and second questionnaires enabled us to assess the efficacy of this process, as well as young people's degree of reflection, permeability and interest in the water crisis problem and in science in general.

During the course of the *Perception and Awareness of Science – Ethics and Polemics* Project, questions had to be confronted that seemed taken for granted but which cyclically came up in the educational debate: why must science be taught and what kind of science should be taught.

It is on the basis of these topics that the studies on science communication are joined by those on scientific education. Steven Turner, in «a tale of two research fields» (Turner, 2008), explains how the two fields of study are starting to interact feverishly, also involving ethical, technological, pedagogic and cultural issues that, all things considered, refer to the role or, better, to the roles of science in our society.

An overview of the range of issues at stake is presented in the second part of the book, which opens out to contributions and experiences outside of our research group in a few crucial contexts: ethics, media and education. Of course, not even these frameworks can complete the «mosaic of arenas» (Hilgartner, Bosk, 1988) of which the public space is made up, but they certainly give us a glimpse of the intricate design that is at their basis.

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