

Perceptions of Science

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As a fresh EASST member, I attended the recent Vienna 4S/EASST Conference on 'Worlds in Transition'. Here are a couple of recurrently observed pitfalls from otherwise generally quite interesting sessions at a well-organized and dense conference.

science and technology are not monolithic
Sociological studies are not rarely involving surveys on the perception of science (and/or technology) by layers of the society or even by the society at large. Science is however frequently presented as a kind of monolithic entity, which it is not, and therefore the corresponding survey results might be seriously polluted or at least might be blending a number of secondary effects. Thus there is a real danger significantly wrong conclusions be derived, not only by the surveyors themselves, but also by the subsequent users of the survey, for instance science policy makers and deciders.

Running a survey on science in general is roughly equivalent to enquire about transportation in general. And we do know there are some differences between a bicycle and a jumbo jet or a cruise ship. And those differences are not only effective at the level of the transportation means themselves, but also relevant to the context of specific travels, to the destinations aimed at, and so on. And the differences between scientific disciplines are as varied as between the transportation means above, even if all of them aim at the progress of knowledge.

Part of the problem might arise from the fact that the involved (teams of) sociologists are lacking expertise or enough insight into various fields of science and their respective potential perception (see also below). In any case, we would urge *anyone* enquiring about the perception of science or of scientific issues to record and to state the context in which the survey has been made (the landing of Man on the Moon, the AIDS scandal, the 'Dolly affair' or whatever).

Even better, each surveyee should be asked about his/her perception of 'science', in the sense of what is that person thinking of when asked about science in general. It is obvious that some

mediatic hype about a specific scientific event might seriously affect the global public perception of science nationally or internationally. For instance, the GMO debate has masked, for a significant number of people, the far-reaching consequences by the completion of the genome project while physics and space sciences remained basically unconcerned by those issues.

In conclusion, when speaking of science in general, the variety of science, the context of the time and the individual perceptions must be taken into account. Hasty generalizations should be avoided in the light of the complexity and nuances of the actual situation.

perverse perceptions

Astronomy and space sciences are interesting fields to investigate public perception. Astronomy has penetrated society remarkably well with an extensive network of associations and organizations of aficionados all over the world. Some of them are well equipped for observing the skies and occasionally become involved with professional research. The deep human need to understand the universe has also led organizations and governments to set up public observatories and planetariums that fulfill academic requirements as well as public educational and cultural interests.

The distinction between professional and amateur astronomers is generally made nowadays on the basis that the former ones are making a living out of their astronomy-related activities, being paid by some official organization, carrying out some research or participating to some project linked to the advancement of knowledge. Amateur astronomers are themselves classified in two categories: the active and the armchair amateur astronomers. While the latter ones have generally a passive interest in astronomy (reading magazines, attending lectures, and so on), the former ones carry out some observing, often with their own instruments, and such activities can be useful to professional astronomy.

Many amateur astronomers have however a poor knowledge of how exactly professional astronomy is carried out and what are the requirements on the

professional astronomers themselves. (This is also the case for many potential students in astronomy.) For good amateur astronomers, the 'nec plus ultra' of the achievements would be to know all the major stars, the constellations and the visible planets in their share of the sky; and they would expect at least the same from professional astronomers.

Not at all. Many professional astronomers do not know anything about the nightly sky patterns because they conduct theoretical investigations. And those who do carry out observations do not need to be able to point the finger at their pet objects (most of these would be invisible for the unassisted eye anyway): professional observers simply need to know the coordinates of their targets and to enter them into the computers piloting the ground-based and space-borne telescopes.

If such a hiatus is already existing between professional astronomers and amateurs who are supposed to know something about science, one can imagine the breadth of the gap with the grand public. And this gap is again potentially larger for sciences with less impact on the society. What then can be said on the validity of public understanding of science? The solution here is education, not through hype and sensationalistic broadcasts or interviews, but through detailed and realistic lectures by patient and non-publicity-seeking experts.

The sports car effect

Car makers (and other manufacturers) know how important it is to have a luxury item in their line of products. Few people will buy it, but most purchasers of the standard items will get something of it, be it only through the image associated to the brand name -- somehow like dreaming (or getting the friends and colleagues dream) of an unaffordable expensive lover.

In that perspective, something interesting can also be pointed out, and involving again astronomy and space sciences. In reader surveys conducted by popular science magazines, subjects such as astronomy and space sciences received regularly the top rankings in terms of *interest*. Medicine, generally thought as being the primary subject of choice by the public, reaches lower scores.

The difference is that, when comes the time of distributing the pennies, the public opinion, and then the policy makers and politicians, go down to pragmatic issues, in line with the fact that -- after

the end of the Cold War and long after the landing of Man on the Moon -- the society at large has now other priorities (such as health, environment, security, unemployment) than space investigations or cosmological understanding. This is when and where the biosciences come first. And this is another reason why public surveys on science perception must be extremely carefully worded, analyzed, interpreted and put into the proper perspective.

Bibliography

Readers interested in several aspects mentioned here in the context of astronomy and space sciences could refer to the chapters under various authorships in the book 'Organizations and Strategies in Astronomy and Related Space Sciences' (Ed. A. Heck, Kluwer Academic Publishers, in press, ISBN 0-7923-6671-9) and to the references therein.

Several chapters dealing with public outreach, news media and so on can also be found in another book just published and entitled 'Information Handling in Astronomy' (Ed. A. Heck, Kluwer Academic Publishers, 2000, ISBN ISBN 0-7923-6494-5).

The author of these few lines has a 30 year-long international career in astronomy and space sciences with interdisciplinary collaborations involving, beyond instrumental technologies and information sciences, psychology, biology, medicine and sociology. He has also degrees in communication techniques and mass studies.

A couple of years ago, he launched the so-called 'socio-dynamics of astronomy and space sciences'.

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