

Human resources in S&T

Cultural, educational, economical, and political
background

Paul CARO

Académie des Technologies

France

A complex web

- The attractiveness of science and technology careers for young people depends on a complex web of causes which act at the individual level through personal tastes and hopes and at the collective one through the influence of peers, the mood and spirit of the time (public opinion and pressure of the show' society) and the economical needs.

Efforts in education

- The observation of a lack of interest for youngsters in scientific careers in recent years has produced a number of efforts to boost the educative presentation of science in schools.
- On the « official side » initiatives from the scientific community to help the teachers.
- On the « non official side » initiatives from associations, or of the informal scientific community (museums, science centers, learned societies, industry, ...)

A vigorous action

- Those actions concern a growing number of teachers and classes. The Ministries of Science and the Academies of sciences in Europe have been very active on that front.
- For instance « La Main à la pate » originated in France, inspired by a US model, and concerns other European countries and on the same battlefield there are : « Pollen », and Ciência Viva.

A pedagogical strategy

- Those actions have in common to valorise the experimental part of the teaching of science and to propose enquiries as a way to learn. This *pedagogy by project* is becoming to be considered by the official teaching programs. It follows many pedagogical experiments of the past (Freinet in France) and is used in the US since the NAS report of 1995. It has been recently proposed to the European Commission as a way to improve the attractiveness of the teaching of science (Michel Rocard's report, 2007)

The job factor

- Youngsters have an eye on their future and watch for potential area for jobs. From that point of view a scientific background may be useful. Science and math trainings are important parameters for graduates of the secondary schools allowing them to enter Universities or dedicated schools.
- In France we observe a strong decrease in secondary schools graduates in humanities and literature including social sciences and economy, and a growing number of graduates in the scientific series. (« Libération » October 6 2007 page 12)

University drop outs

- However there is still a problem as there is an important number of failures in University first years. The question is under investigation and proposals will be made by Academic commissions to improve this situation in the framework of the European Bologna scheme of University studies especially to improve the professional character of the Master stage.

Human resources for Research

- It is quite obvious that the quality and number of human resources for research and high level teaching depend of the salaries offered for those positions which may not be considered attractive by young people especially in view of the length of the studies. This point has to be corrected especially for public positions.

Science and public opinion

- Public opinion depends on the presentation of science by the media. Media have a way to present science which uses the mythological support of basic figures and situations of tales and legends and as a consequence do like dramatization. Scientists are quite often villains in films or TV series especially cartoons for children where science and technology are associated with power, good or bad.
- Some political debates are associated with scientific sensitive and emotional issues concerning health or feelings about nature which affect people directly as a contact with the body may be involved. The idea of Nature is a matter of debate in Europe since the 18th century and the quarrel between Enlightenment and Romantism. (for instance the GMO problem). There has been several episodes in history of “science wars”, some quite recent, and political problems are frequent on energy or food problems.

Reasons to be optimistic

- It is clear that an effort is underway in Europe to improve science education especially by bringing more scientists in contact with young people. The association between potential jobs and some knowledge in science seems already established. But it seems also that the public opinion still do not trust science ...