

## CONCLUSIONS

of the EU French Presidency Conference:

*L'apprentissage des sciences dans l'Europe de la connaissance  
Science Education in the Europe of Knowledge*

Grenoble, France, October 8th-9th, 2008

*These conclusions are brought to the attention of Xavier Darcos, President of the EU Council of Education and Valérie Péresse, President of the EU Council Competitivity, for communication to the EU Commission (Research & Education and Culture).*

The participants in the Conference, coming from all EU countries, wholeheartedly agree that science and science education must play a central role in the construction of the Europe of knowledge and the progress of Lisbon process. Science is a rich domain of our culture; science ought to be shared with all.

Excellent and recent European or international reports have analyzed the current status of science education, the attitude of youth towards science, the needs for developing new competences for a variety of careers, the serious issues for the culture and the shortage of scientifically skilled personnel in industry. Without underestimating the importance of informal education, these reports show a consensus on the need to act urgently and in a collaborative manner on the formal education systems, at all levels beginning with pre-school. The Conference unanimously agreed that these many analyses already have made clearly explicit the reasons for urgent action at institutional levels.

Natural sciences, with their reciprocal relations with mathematics and technologies, represent a unique field for a European cooperative action, given:

- the historical and present role of the European creativity and diversity both in the advent and growth of modern science;
- the universality of science, scientific attitudes, concepts, manifested in the research community, which all exhibit a convergence of objectives, methods;
- the growing will and involvement of the scientific and engineering communities to contribute to the needed improvement of science education.

The Conference has stressed that improvement and changes in science education and its pedagogy must be provided both in any Member State by universities, educational systems and authorities, and by EU institutions, according to their own means of intervention. Therefore, the Conference conclusions and recommendations on science education are directed towards:

- the Ministers of Education & the Ministers of Higher education and research in EU states, in preparation of their forthcoming meetings in 2008;
- the EU Commission, as a support to and detailed enrichment of its 2008 Communication on the matter.

The conclusions recommend three types of actions, which will mutually reinforce each other:

- a thorough action in each nation for the improvement of science education and especially for a renewed pedagogy;
- an intensified cooperation between Member states;
- an increased action based on the EU Open method of coordination.

The Conference emphasizes two specific aspects to be addressed:

- the need to learn from successful practices and develop them on a large scale;
- the need of a long-lasting effort, of the order of a decade or more.

Creativity of teachers will stimulate creativity of students. As innovation in science education is made of invention, implementation and dissemination, each of the following items needs addressing, a number of these paths being already explored locally and with success in several EU States:

**REGARDING TEACHERS:**

1. Teachers professional development by:
  - a. developing self-training, distance training, session training tools;
  - b. developing criteria of quality for training;
  - c. developing systemic analysis of teacher training (cost, implementation..).
2. An *Erasmus* for teachers:
  - a. physical circulation of teachers within Europe, to create a face-to-face community of exchanges and stimulation, in parallel with the scientific community;
  - b. exchange of experts;
  - c. an ICT platform and database for collaboration of professionals.
3. Facilitating, by national and transnational EU networks, close cooperation between
  - a. teachers with the research community;
  - b. teachers and schools with industry partners;
  - c. teachers with centers for informal education.

**REGARDING CONTENT:**

1. Better integration of scientific disciplines, from the point of view of:
  - a. the student : curriculum, activities, diversity of talents;
  - b. the teacher : understanding of the nature of science, history, ethics;
  - c. wider practices of interdisciplinary cooperation among teachers;
2. Experimental access to mathematics at all school levels;
3. Sharing of resources for curriculum design and implementation ; supporting outreach from research institutions ; material equipment of schools; quality control with respect to the diversity;
4. Designing methods of student assessment, in harmony with a renewed pedagogy of science.

**REGARDING STRUCTURES:**

1. Developing networks of pilot centers, in every EU country, taking into account the diversity of local conditions but closely related to each other Europe-wide, in order to disseminate and capitalize innovations ;
2. Supporting a program of research into student and teacher attitudes and effective pedagogy.

To build the Europe of education, science provides an exceptional leverage. This common ambition, to be manifested by an EU coalition, opens an immense field of partnerships in Europe. It may be stimulated by the creation of a high level and visibility *European Group for Science Education* in order to promote these vital actions, in close cooperation with Member States and the EU Commission directorates.