



Towards Public Involvement in Science: Interactive Exhibitions and Informal Education

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Themes
and
Questions for
Dialogue

Chair:

Hannu Salmi, Professor, Helsinki University, HEUREKA, (Finlande)

Speakers:

- Per-Edvin Persson, Director, HEUREKA (Finlande)

"Science Changing the World: The European Exhibition, Expertise & Everyday Lives"

- Sofoklis Sotiriou, Manager of Research and Development, Ellinogi Germaniki Foundation School, Athens (Grèce)

"Science Centres and Museums Linking Europe"

Attempts to develop scientific and technical culture among a wider general public visiting science centres and museums is leading a large number of the latter to establish strategies and to put innovative methodologies in place with the aim not just of generating interest in science, but of provoking questions as a means of acquiring a scientific approach.

Today, informal education, which is practised especially in science centres and science museums, represents one of the educational methods most likely to complement school teaching and to fight openly against young people's notorious disaffection and disinterest for scientific subjects. It needs to be created in open environments with a mix of experimental science, a hands-on approach and the use of technology.

The two European experiments presented are:

Science changing the world, a jointly created touring interactive exhibition on the history of great scientific advances of the last century which radically changed the development of daily life for man and society. This project is currently being co-ordinated by the Finnish Centre For Sciences, Heureka, in conjunction with three European countries: France, Portugal and the Netherlands and with major international science centres: the Cité des sciences et de l'industrie in Paris, the Museon in the Hague and the "Ciência Viva" knowledge pavilion in Lisbon.

This planned exhibition offers an opportunity to explore the major changes which have left their mark on society through four scientific themes: "Life and Mind" explores the mysteries of life and the brain, "Towards a Better Health" explores the impact of progress in medicine and biology on human health in the prevention of disease and epidemics, "System Earth" explores the earth's system, the environment, climate change and sustainable development, and "Beyond the Invisible" explores the structure of matter and the universe.

Connect, a European advanced IST (Information Society Technology) project is primarily aimed at connecting formal science learning in a school context with informal learning of scientific content prepared and disseminated by museums and science centres in an open and interactive environment.

The *Connect*¹ project was the beneficiary of a grant from the European Commission within the framework of the 6th Framework Programme, and brought together a consortium of seven partner countries: Germany, Great Britain, Finland, Greece, Sweden, Israel and the United States.

Using sophisticated technology based on the principal of "augmented reality", the *Connect* project creates collaborative hubs for online learning and develops intelligent technological interfaces to manage teaching

¹ <http://www.ea.gr/ep/connect/>

activities and methods between communities of learners within the framework of educational projects. The aim is to promote communication and sharing of multimedia teaching resources between schools, science centres, museums and teachers through networking and to provide access to banks of educational scientific resources. *Connect* offers new ways of viewing science teaching through online activities as a precursor to the classroom of the future. The aim is not just to make the teacher's research task easier, but also to stimulate pupils' curiosity through a multitude of activities targeted to reawaken their taste for scientific subjects, to make them aware of the scientific approach and to build a world whose aim is finding pleasure in learning and understanding.

These two projects for communicating and disseminating scientific knowledge demonstrate by their originality a powerful desire to educate and encourage different and varied audiences to see the appeal of science and technology, emphasizing an interactive approach in order to break away from an overly academic vision of learning. Recourse to innovative methods combined with the use of technology leads us to reconsider the role which informal information can play in complementing school teaching.

The themes explored in the discussion raised a series of points which call into question:

- *Science teaching* and the need to

have recourse to more active teaching methods, starting in primary school.

- *Teacher training and the school curriculum* and the need for reform in order to legitimize a more inductive and less abstract approach to scientific education which emphasizes: observation, experimentation, the joys and pleasures of discovery and the right to make mistakes. Learning would become more effective.
- *Lack of commitment on the part of decision-makers at government level* to push the boundaries and develop a science teaching policy linked to innovation and research. Issues relating to the development of tools and resources for training must draw on a wider scientific community if scientific education is to be fully reformed. This involves curriculum and teaching practice reforms.

The question is: how useful is the European Union in curbing the crisis in science education? The group all emphasize that it is up to Europe to assist with a meaningful expansion of innovative teaching approaches and to facilitate multilingual access, training for a greater number of teachers and more stringent evaluation.

On the latter key point, teachers are ill-equipped to put in place innovative teaching approaches in science and are impotent in the face of the crisis in scientific

vocations amongst the younger generation. This worrying disaffection and disinterest concerns those authorities responsible for education and teachers, research and scientific centres, stakeholders in informal education, as well as the economic and industrial sectors. How can we explain this? How can we remedy this?

PROMOTING A NEW APPROACH TO SCIENCE THROUGH CULTURE

After these thoughts, the speakers reflected on the part which science must play in the culture of a 21st century citizen. What scientific heritage is it desirable to hand down to future generations and how should we do this?

Contributing to developing the spirit of scientific enquiry whilst following an approach based on discovery and learning is one of the aims and missions which science centres and science museums are striving to achieve. A science museum or science centre is viewed as a permanent and indispensable link between the worlds of science and teaching. Permanent interaction must exist between discovering a phenomenon through fun activities and the complexity of scientific thought. The aim today is to teach visitors to produce their own knowledge and to discuss the results obtained with a group or with other visitors.

In order to attract as many people as possible, science centres and science museums often have to use a large amount of resources to attract and retain a fickle audience and are placing their faith in visitor support and mediation. This is essential, as without it would be impossible to absorb any knowledge or to observe anything. Visitors are plunged into a stimulating environment where science becomes a show, engaging with contemporary scientific ideas.

The acquisition of scientific knowledge is worth reinforcing and expanding through the sustained involvement and commitment of scientific communities in science centres and museums. These institutions suffer from a flagrant lack of recognition, despite continuous efforts to make science teaching more widely attractive and accessible.

As a result, it is important to be in a position to learn to learn and to learn to understand the meaning of science and technology whatever one's profession and place in society. Scientific culture helps to build democracy.

Could this possible lack of interest or knowledge in the fields of science and technology lead to a democratic deficit?