

Ecsite Annual Conference 2009, Milano
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Session #40 - Are teens the next challenge for contemporary museums?

Is scientific knowledge valuable to be *teen-citizens*?

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objectives

connect

- scholar-everyday life knowledge (personal relevance of science)
- scientists-students

stimulate

- interest-curiosity in science
- skills of science communication
- science as experiments not just books
- science relevant for everyday life
- students personal involvement
- science as process not just results

School Science Society (2007-now)

- topics: biotechnology and energy
- target group: teenager – school (16-18 years old)
- 3 classes (2 technical - 1 humanistic high school)
- 2 years work for each class

activities

- class divided in groups chose a scientific news related to the topic
 - investigate the news through lab activities, talking with experts (scientists, teachers, museum staff, relatives...), literature, research
 - final output is to produce an experiment to investigate the news and to communicate in the museum the project to teachers, peers, scientists
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- developed by teenagers in collaboration with museum staff
 - class work in 4-5 groups
 - work carried out in groups
 - 8 meetings: 4 in school, 4 in the museum

methodological elements

- science not just as products-content but also as processes-skills
- open ended situation
- challenge, novelty
- skills of communication
- discuss with teachers teaching needs, students learning needs
- dialogue with experts
- connection with institutions outside school (museums, university, civil society association)

some results

- 4 teenagers come to the museum every 15 days to control their drosophilae and join all museum lectures
- students more interested than teachers
- students appreciated
 - 1 first-hand experimentation
 - 2 collaboration with the museum
 - 3 a new way to work with science
 - 4 stimulated my interest in science
 - 5 connection school study- real word

what participants say

- the project helped us to know how the job works and how research works. You try but you do not know what will happen
- I am not satisfied because I did not have enough time to end the experiment and I did not reach my objectives
- thanks to the project and to the museum the class work was less boring
- do not be afraid if your original idea is *impossible*; instead thanks to the collaboration with the museum it becomes *difficult*
- thanks to the project I realized how research works
- the project was interesting but you need to improve the organization part

problems

difficult

- access to school laboratory
 - find free dates for meetings
 - connection with the curriculum
 - role of the teachers, which kind of involvement?
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- teens questions not follows school topics
 - working through *hypothesis -experiments-new hypothesis -new experiments* is a new way of working for them: takes time, 2 years
 - about none contacted expert outside the school-museum
 - not used to manage their own work, to develop their own questions-answers

doubts

- is sustainable for the museum? In term of time and staff?
- difficult connection with the curriculum – project not for school?
- to start from open questions and allowing them choosing the question is positive for their motivation but difficult for teachers and an hard task for the museum (ex: when life is born? Idea of cell membrane)
Is it better to close a bit starting question?
- how to involve not interested students? (drama? art? new technologies?)
- not controlled experiments are not common in school, new way of working a bit frustrating sometimes when they do not have a product

future

- propose teens to become explainers
- meeting with scientist organised by the museum
- propose a community problem (GMO in supermarket, air pollution...)
- dates of all meetings in advance, when school year start already fixed

science - citizenship

- evaluating information
- express personal point of view
- science as a process
- scientist do not know everything
- knowledge as a tool for belonging to society

science - citizenship

A consultation on developing a new strategy for the UK Department for Innovation, Universities and Skills (DIUS)

What do we mean by Public Engagement and Dialogue?

[...] Any good engagement activity should involve aspects of listening and interaction. Public Dialogue, a form of deliberative participatory engagement where the outcomes are used to inform decision making, is just one important kind of public engagement activity. **Having an engaged public means recognising that science is not just a body of facts, but a discipline with established methods of inquiry, peer-review, and governance.** It means understanding that science is **often about measuring uncertainty.** It allows ordinary people to better challenge what they read about, and understand different forms of scientific evidence.

Thank you

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1 Agree - 5 not agree with the sentences

- 3,9 first-hand experimentation has been interesting
- 3,9 collaboration with the museum has been interesting
- 3,4 I learnt a new way to work with science
- 3,1 the project stimulate my interest in science
- 2,6 the project helped me to connect what I study with the real word
- 1,4 the project has been too difficult

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**A consultation on developing a new strategy for the UK
Department for Innovation, Universities and Skills (DIUS)**

- **What do we mean by Science and Society?**

We include engagement with society in its broadest sense, from **science centres and festivals, through information provision by consultation, active dialogue and other media, to enabling citizen empowerment and decision-making**. We include the use of science by society and the provision of scientific advice to policy makers for the benefit of society. We include the range of science skills opportunities, through the education system and beyond, and the importance of diversity in Department for Innovation, Universities and Skills (DIUS) enabling a workforce truly representative of the society which it serves.

- **What do we mean by Public Engagement and Dialogue?**

We are using 'public engagement' to be an **umbrella term** – that encompasses many kinds of activity including **science festivals, centres, museums, cafes, media, consultations, feedback techniques, and public dialogue**. Any good engagement activity should involve aspects of listening and interaction. Public Dialogue, a form of deliberative participatory engagement where the outcomes are used to inform decision making, is just one important kind of public engagement activity. **Having an engaged public means recognising that science is not just a body of facts, but a discipline with established methods of inquiry, peer-review, and governance**. It means understanding that science is **often about measuring uncertainty**. It allows ordinary people to better challenge what they read about, and understand different forms of scientific evidence.

The PISA 2006 definition in the *Framework* for the 2006 test (OECD 2006) and the associated text have been influential for many countries' integration of scientific literacy into their national curricula. The PISA 2006 study defined literacy as follows.

- Scientific literacy refers to an individual's:
- Scientific knowledge and use of that knowledge to identify questions, to acquire new knowledge, to explain scientific phenomena, and to draw evidence-based conclusions about science-related issues;
- Understanding of the characteristic features of science as a form of human knowledge and enquiry;
- Awareness of how science and technology shape our material, intellectual, and cultural environments; and
- Willingness to engage in science-related issues, and with the ideas of science, as a reflective citizen. PISA (2006)