

Improving Education in Secondary Science in Europe (IMPRESSE)

Pupils' Experimental Activities

Synthesis of the workshops and discussions
during the Impresse-2 meeting in Rennes (22nd October 2005)

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Lab work is essential.
So we need to assess it.
For this we need criteria.

Why is it so essential?

It is important for the man/woman in society to be able to question what is in the world and what is happening in the world.

By developing an enquiry and scientific approach in schools, every one gets closer to how science works and how scientists are working.

People might not remember every physical law they have learnt, but they will keep the skills of how something can be proved or denied. At the end of the day, the aim is to avoid a new 'Galileo trial' where the jury was unable to grasp the validity of the proof given by Galileo for lack of scientific knowledge.

People must be able to question assertions of 'experts' and make their own mind on such topics as fossil vs. renewable energies, GM foods, mad cow disease, avian flu etc.

Besides, students generally like doing experiments, and it adds a lot to their motivation, as we have perfectly seen in Brenda and Stuart's presentation earlier this morning.

Of course some of these students will go on studying sciences at university (and we will need a lot of them in the next few years); these also need to have a true insight of what science is about, and what they are going to do during their academic years, in order to avoid any disappointment, which could lead them to opt out of these studies; this can be met only through real experimenting.

How do you achieve these goals?

By carefully planning the worksheets in practicals: the talks given this morning showed how a challenging starting point and a worksheet prompting the students' thinking help them take in new knowledge more effectively. The practicals do help them give meaning to their theoretical knowledge.

One problem is that the designing and planning of this work is very much influenced by assessment practices: "Will this be in the exam?"

So what about our assessment criteria?

We usually do our best and tend to train teachers better in this respect, we discuss this among teachers, but we also need legitimacy in front of the politicians. What form should it take?

We are convinced, but we sometimes lack arguments to prove our point. MPs generally find that we are teaching expensive subjects, laboratories are expensive to run. Wouldn't the students achieve better by simply using animations available on the Internet rather than experimenting with actual objects and instruments? Wouldn't the students achieve better in our national or European tests if they solved written problems in place of experimenting? These questions are not always asked so bluntly, but they must be in the minds of lots of people.

Our starting point could be collecting and sharing our criteria, and from these, create a grid of capacities linked to lab work; it could look like the language skills that have been listed and organised by the Council of Europe in the “Common European Framework of reference for Languages”.¹

We could also collect and compare assessment examples and read them against our objectives in terms of skills, against the criteria we would have chosen, and against grids such as the one that was presented this morning by H el ene Richoux in terms of knowledge and understanding.

And what will we do after that ?

- **a light meeting organised by NVON in september-october 2006,**
- **then, a 1.5 day meeting during the MNU-congress in april 2007 in Berlin,**
- **and then a 1.5 day meeting during the ASE-congress in january 2008.**

¹ [http://culture2.coe.int/portfolio/inc.asp?L=E&M=\\$t/208-1-0-1/main_pages/./&L=E&M=\\$t/208-1-0-1/main_pages/levels.html](http://culture2.coe.int/portfolio/inc.asp?L=E&M=$t/208-1-0-1/main_pages/./&L=E&M=$t/208-1-0-1/main_pages/levels.html)
[http://culture2.coe.int/portfolio/inc.asp?L=E&M=\\$t/208-1-0-1/main_pages/./documents/assessment_grid_english.doc](http://culture2.coe.int/portfolio/inc.asp?L=E&M=$t/208-1-0-1/main_pages/./documents/assessment_grid_english.doc)