Experimental activities in Flemish Education System

Organisation of Flemish School System

Science teaching as we discuss here (physics, chemistry, biology) is only scheduled in secondary school. Experimental 'activities' are often demonstration experiments, carried out by the teacher. Only in few, specific specialisations pupils are expected or invited to carry out experiments themselves.
There seems to be a tendency in Flanders to reduce the number of hours dedicated to science (and mathematics!). Another tendency is that separate hours of physics, chemistry and biology are combined into (sometimes less) hours of 'natural science', all taught by the same teacher.
Number of students that choose science at university is fluctuating; but it is clear that less scientists choose for a career as a teacher. More and more engineers teach sciences at school.

Compulsory or not?

The content of the science program is defined by final goals. These final goals are compulsory and defined by the ministry of education.
Choice of experiments is, in most curricula, relatively free, sometimes the number of experiments to be done is imposed. Schools have the possibility a to assign a small number of 'loose hours' to e.g. science, which then can be theoretical lessons or lab work (experiments).

Target group of pupils

The target groups are simply the pupils that are in a given school in a given discipline. Since there are few or no after-school programs or initiatives, organised by schools or individual teachers, it is difficult to say more about 'targets'.
There are extra muros activities (see 4.) and projects (like Olympiads for Physics, Chemistry and Biology), but the are open to everybody (interesting!), so one cannot really speak of 'target groups'.

Ways to make science (studies) more attractive

Surely, doing attractive experiments will increase the interest of pupils in science. It may prove beneficial to have these experiments run outside the school: some pupils find (scientific) subjects or topics less interesting because they are dealt with in a science classroom! This is proved when attending e.g. to a visit that pupils pay to 'science stimulating projects' that are known at several universities (Physics@Lab at the K. University of .Leuven, Brugproject at the University of Antwerp).
The Flemish government organises (together with universities and high schools) every other year a science week and a science festival. Classes of the third grade can visit a lab, get some explanation and do experiments which they couldn't do at school because of the expensive equipment.
In the past three to four years broadcasting (radio and television) has made science more popular in Flanders, but it mostly concerned 'light versions': subjects are covered based on their 'news value' (attractiveness for the audience) rather than on their scientific relevance.
Science Parks (Technopolis, PASS, Earth Explorer,...) make experimenting fun. Visits are mostly organised by schools (which then are compulsory activities), so large groups of pupils attend together which yields another kind of interaction with the experiment than in a school lab. Some pupils visit these Science Parks with their family, so outside of school time.
Science Museums (e.g. Belgian Museum of Natural Science) are rarely visited by schools.

Real experiments versus simulations

These questions arise:
How more valuable are real demonstrations experiments in respect to simulations?
How do pupils valorise simulations versus real experiments?
Have simulations done by pupils any pedagogical value?
How more valuable are real demonstrations experiments in respect to simulations?

Skills and training of teacher doing or coaching experiments

These questions arise:
Are nowadays science teachers well trained to perform experiments that are an asset to the lesson given?
Are nowadays science teachers able to act as a coach for pupils who are doing simulations?
Do science teachers have access to sufficiently good user guides for doing classroom experiments,
Are textbooks or lab user guides sufficiently good to enable pupils to perform experiments themselves?

Additional (or final) questions and suggestions

Are experimental activities set up in such a way that pupils are active in their learning ?
Do they have to make up a strategy or just follow a recipe ?
Are textbooks or lab user guides sufficiently good to enable pupils to perform experiments themselves?
Are experimental activities set up in such a way that pupils reflect on their learning, and learn the ability to control and to regulate their own learning?
Are experimental activities set up in such a way that pupils construct as much as possible their knowledge, not merely receive it?
Are experimental activities set up in such a way that pupils develop their scientific understanding by pedagogical 'actions' as observing, classifying, experimentation, pattern seeking and comparing and contrasting ideas.
Can seeing or doing experiments enhance the Interdisciplinary Approach of science teaching?

The evaluation of these 'actions' is very difficult. Maybe this can be an issue for the next IMPRESS ?