



GOOD PRACTICES IN STEM EDUCATION

Title	Use of on-line virtual and remote labs in science education
Brief description	<p>On-line laboratories are aimed at supporting education based on research and provide opportunity to conduct scientific experiments in virtual environments. For optimal learning results it is important that the study process is well-structured. Software tools help students in different tasks – for example to create hypotheses, experiments, to interpret data etc. Virtual labs simulate real equipment. Remote labs enable students to collect data from real laboratory with real equipment.</p> <p>Go-Lab Project for example provides online science labs (Virtual and Remote). Another interesting on-line resource is Sally Ride EarthKAM – NASA sponsored programme.</p>
Level	Used in different schools at national level.
Advantages Why is it innovative/ attractive to students?	<p>It helps teachers to use the available free on-line resources in order to present specific scientific content and to encourage student’s interest. Students can get familiar with installations and Labs far from their country, which they may never have a chance to visit personally. They can make their own real-time explorations.</p> <p>These innovative approaches provide direct access to real unique equipment at a distance and make experiments available in each classroom. The use of a virtual environment provides an opportunity for a large number of students to acquire new skills and obtain live data. These are not only innovative, but also cost-effective solutions for improvement of science education in each school and in any scientific area.</p>
Teachers’ opinion	For schools with lack of resources and not so well equipped labs it is an opportunity to encourage student interest and to make virtual explorations and experiments.
Students’ opinion	It is very interesting to use on-line resources especially real remote labs. Virtual labs provide students with the opportunity to make “their own” experiments whenever they want.



Difficulties	The main challenges are the various aspects of accessibility and difficulty for the teachers to introduce use of on-line virtual and remote labs in science education into their institution in case that they have to strictly follow a given curriculum.
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