

Real science in virtual school labs

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Up-to-date marine data enables students to carry out scientifically valid virtual experiments. The method yields insights on how scientific knowledge is created and developed, according to research from the University of Gothenburg, Sweden.

Researchers from the University of Gothenburg followed upper-secondary students from the Swedish town of Lysekil for one year. The study was part of the research project I2I, Inquiry to Insight.

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The method of using virtual tools has a high level of applicability and can be used in a wide range of learning situations, within both the natural and social sciences. The main point of using the method is that it makes students truly understand how scientific knowledge is created.

'It's a fast, safe and cheap way to get the work done, in contrast to expensive and sometimes dangerous science labs in schools. It's based on authentic research results that the students can compare with their own results. The experiments allow students to for example simulate the future, and they can stop what they're doing at the end of a class and pick up where they left off a week later. That's perfect in a school context,' says Senior Lecturer Annika Lantz-Andersson.

The Gothenburg researchers believe that the methods used in Lysekil could work well on a national scale thanks to the ample access to scientific data and cheap virtual tools.

The project partners at Stanford University in USA assessed the knowledge levels of more than 500 students before and after using the virtual lab. Their results enabled the researchers in Gothenburg to study how the students developed an understanding of scientific work and concepts. Now the researchers are trying to learn more concretely how virtual lab students work to find answers and discuss how studies and experiments should be designed to yield new knowledge. This work is based on about 25 hours of video-taped student interaction in the lab environment.

One conclusion that confirms previous research on digital tools is that the work of the teacher is extremely critical to successful learning.

'The way that the teacher introduces a lab session is crucial, and it is important to realise that computer software is not by any means self-instructive. The teacher needs to actively challenge the students' understanding and give them a chance to ponder over what the virtual experiments are meant to represent. The teacher's communication with the [students](#) is very important in order to avoid that the virtual experiments end up being just another abstract computer task,' says Lantz-Andersson.

Provided by University of Gothenburg

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