Socio-scientific reasoning in a digital learning environment – a report from the European CoReflect project

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Research topic, Theoretical framework and Relevance for Nordic Educational research: Young peoples' lack of interest in science and science intense educations are a big concern for many stakeholders in western societies (e.g. Sjöberg & Schreiner, 2005). This has led to a call for a renewal of science education, with the aim of making more students feel that science is of relevance and importance for themselves, and for the society as a whole. There has also been an increasing acknowledgement of the importance of scientific knowledge among people, to make an active, and informed citizenship possible. Because of that many researchers in the field of science education suggest that work with "socio-scientific issues" should be included in the teaching of science (Sadler, 2004). To include "socio-scientific issues" in the teaching of science prepares youths to deal with questions that they will meet as citizens. It is also a way to make science relevant for greater numbers of students. Yet another strategy to make science more appealing, and promising for meaningful learning, is to integrate new technologies (ICT) in the teaching.

Methodology/research design: This article is a report from a pilot study within the European project, CoReflect (www.coreflect.org). In the CoReflect project– groups in Cyprus, England, Germany, Greece, Israel, Sweden and the Netherlands are developing, implementing and evaluating teaching sequences using the web-based platform STOCHASMOS (Kyza & Constantinou, 2007). The interactive web-based inquiry materials support collaborative and reflective work. The project methodology is based on the idea of design-based research. The teachers are engaged througout the project. The learning environments are iteratively tested and refined, first as pilot projects, then during local implementations, and finally during implementations and synthesis work at the European level. Data exists in form of audio recorded group discussions, students written documentation, surveys and interviews.

Expected conclusions/findings: All learning environment are focusing "socio-scientific" questions. In the presentation at the conference we report from the design and implementation of the Swedish learning environment. We are focusing socio-scientific issues in an astrobiology context. Students are working with two driving questions Should we look for, and try to contact, extraterrestial life?, and Should we transform Mars into a planet where humans can live in the future? Both questions include a scientific dimension (Is it possible?, Different ways to proceed? etc), but also economical (Resource priority – should we spend many on this?), safety (For humans? For life we find?), and ethical issues (Is it alright to interfere in nature (other planets and possible life)) are relevant. The students working with these issues are in their last year of compulsory school (9th grade, 16 years), and work together in small groups. Results from the pilot study suggest that most student groups come to the decision that we should not try to contact extraterrestrial life, and we should not try to change Mars. Students' arguments include both scientific arguments and other kinds of arguments. During the presentation we report from the student groups' decision making and the arguments used during their work with the driving questions.

References:

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From paper to digital work plans
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Research topic/aim: The overall research question in my study is: How will the transition to digital work plans influence teaching in primary classrooms? The aim of this study is to investigate how the teachers utilize new opportunities through the digital tool regarding teaching and organizing learning activities, and how this impact on the use of work plans in general.

Theoretical framework: Drawing on a sociocultural perspective, I plan to use Activity theory stemming from Leontjev (1978), inspired by Vygotsky (1978), later elaborated by several, especially Engeström (1987, 1999) as a theoretical framework and tool in the process of analysis. Activity theory combines different levels of analysis and include several relations between actors and tool in order to describe processes of change within an activity system, e.g. an institution (Rasmussen & Ludvigsen, 2009). Activity theory is expected to be helpful both in keeping the direction of analysis in this study and revealing prospective chances in the teachers practice.

Methodology/research design: The study is planned conducted as a single case study where Redmount Primary School (here made anonymous) represents the case. It is located on the outskirts of Oslo in a middle-class rural district and has about 150 pupils. The schools teachers have used text- and paper based work plans for the pupils for over 10 years and they are now introducing the use of digital work plans. The collection of data is planned done as a series of five collections during a year time, where I especially follow two different teachers through interviews, logs and observation. In between the series of data collections, I will be able to follow the development of the digital work plans by logging into the digital tool as a fictive teacher and/or fictive pupil member.

Expected conclusions/findings: When the work plan for the pupils are digitalized and in use, it is expected that the practice of using work plans for the pupils will change. Other opportunities for organizing learning activities is expected to unfold, compared to before the digitalization of work plans.

Relevance for Nordic Educational research: Ever since the early 1930s individualized and adapted education has been focused on as an important means and end in Norwegian educational policymaking (Klette, 2007). Within American progressivism (Dewey, 1916; Parkhurst, 1922; Washbourne, 1937) we can find individualized and adapted education rooted in theory of teaching and learning. The use of work plans for pupils can historically be placed within this educational tradition (Dalland, 2007; Klette, 2007; Steen, 2007). During the 1990s the use of work plans for pupils in Norway has expanded tremendously and can be seen as