RECENT DISSERTATIONS

MARGARETA ENGHAG, 2004:

Miniprojects and Context Rich Problems. Case studies with qualitative analysis of motivation, learner ownership and competence in small group work in physics (Licentiate's dissertation)

The Swedish National Graduate School in Science and Technology Education, FontD, Linköping University, Sweden
Department of Thematic Studies.
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Abstract

The thesis reports case studies of students working with context rich problems (CRP) and mini projects (MP) in physics in an upper secondary school class and in a physics teacher education class at university. The students report a big shift from physics in secondary school as fun and easy, to physics in upper secondary school as boring, difficult and with lack of time for reflections and physics talking, but they also found physics as interesting in itself. In order to study how group discussions in physics influence the students' learning and to study the phenomena of students' ownership of learning (SOL) we introduced CRP and MP. We video recorded five groups with 14 teacher students at university in the end of 2002, and five groups with 15 students at upper secondary school during the beginning of their second physics course in the spring term in 2003. MP and CRP in physics were used as instructional settings in order to give students possibility to strengthen their contextual understanding and their possibilities to ownership. When students get the opportunity to manage their own learning and studying by open-ended tasks in physics, without the teacher determining all details of the performance, this gives more ownership of learning. The advantage of MPs and CRPs from the student's point of view is more freedom to act, think and discuss, and from the teacher's view, to get insights of the students' ability and how they really think in physics. The ownership is found to be crucial for motivation and development of competence.

Students' ownership of learning is the students' influence/impact to affect tasks and the learning environment in such a way that the students have a real opportunity to achieve learning of physics. SOL is found at two levels:

Group level: At the start of a task the SOL is determined by the design of the task. The choice of task, the performance (when, how, where), the level of result and presentation and report have to be determined by the students themselves.

Individual level: A person's experiences and anomalies of understanding have created unique questions that can create certain aspects of the task that drive this person to be very active and highly motivated. This gives the person a high individual ownership. We developed hypotheses concerning the relation between ownership, motivation and competence and we see some evidence in the cases reported in this thesis. The importance of exploratory talks to enhance learning, and to see aspects of communication as part of the motivation are discussed in the model of ownership, motivation and competence that is proposed.

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Contact: margareta.enghag@mdh.se,
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