

My participation in different research projects, Per Sund

2018-2020 *Education for Sustainable Development: A Longitudinal Implementation Study*

Financed by the Swedish school research institute.

I have 30 per cent research time in this research project studying teachers cross curricular collaborations regarding education for sustainable development. Karlstad University is the project manager.

Education for Sustainable Development (ESD) is a teaching approach advocated in policy documents from the UN all the way down to the Swedish curricula. However, empirical evidence-based studies are a missing link in the discourse around ESD. ESD is defined as consisting of two essential features: a holistic view of the subject content taught, and a pluralistic view of the teaching methods used. In our previous studies we found support that ESD has effects on students learning, but also that pluralism is a very difficult teaching approach to implement in the classroom. Based on these findings, we have developed a project with the aim to find more successful ways of implementing ESD by overcoming the organizational barriers for changing to a teaching practice that also has an effect on student learning and wellbeing. The project consists of three major parts: school development, a teacher professional development (TPD) program and a research project investigating the process and effectiveness of the first two. In the research project we longitudinally investigate the results of the TPD and school development project by using a mixed method approach including a series of data collections over two years. We investigate changes in teacher practices, student outcomes and school organization, and how they interact. Hence, this study will expand and broaden our understanding of ESD teaching, its effects on students' learning and how to implement and organize ESD teaching.

2017-2020. *Research in subject-specific education, ROSE*

Financed internally by Karlstad University following external reviews of different project proposals for the development of excellent research environments. ROSE consists of three research groups (language, history, mathematics and science), which together study the concepts *transformation* and *powerful knowledge* in different ways in different learning environments. I have 70 per cent research time for two years in sub-study 2, *Consequences of the transformation into pluralism*.

Sub-study 2 examines how the concept of sustainability/sustainable development is transformed/changed in connection with the implementation of the subject in nine-year compulsory schools. The preliminary plans/hypotheses are to study the practical consequences for teachers' work when a pluralistic approach is implemented in education for sustainable development in connection with the changes introduced in the curriculum reform of 2011. As the reform has been in place for some time, some of the consequences of pluralism should now be visible. The research focus in the project is to study whether pluralistic approaches have increased compared to previous research studies. Has the curriculum reform meant that science teachers discuss pluralism in different ways or with different words/expressions when they talk about their teaching? What kind of role does subject knowledge have in a school that works in a more pluralistic way? How obvious is the implementation of a pluralistic approach in policy documents, curricula, national tests and the Swedish National Agency for Education's annotations?

2013-2016. *Language and science in large-scale tests, SONAT*

The relation between trends in large-scale science studies and how teaching and learning are constituted in science classrooms

Financed by the Wallenberg Foundations. In this project I had no research time but received economic support for materials, travel and national and international research seminars.

The results show that teachers dominate the oral space in the classroom, but that there is a tendency for girls to have a little more oral space in comparison to previous studies. It is difficult to find significant differences in classroom studies of the language use of pupils attending schools that perform differently in large-scale assessments. However, it is suggested that pupils at high-performance schools use several and more complicated concepts in their discussions about scientific issues. The studies show that there is a greater epistemological awareness of the conditions for producing and using scientific knowledge. One study shows that teachers find it difficult to make individual assessments of practical abilities in connection with large-scale tests in science.

2011-2014. *National tests in biology, physics and chemistry: potential influence on teachers' instruction and assessment*

Financed by the Swedish Research Council. I had 25 per cent research time for the teacher studies. The host institution was Uppsala University. A research collaboration between Uppsala University and Mälardalen University.

The research project studied the significance of the introduction of national tests in science in 2009 and their impact on a school's teaching and assessment. The results show that teachers consider that a new teaching content, such as argumentation and the planning of experiments, is implemented in schools through national tests. Teachers mainly relate to the content of the tests in three different ways, which can largely be understood with the aid of previous studies of teachers' teaching habits in science. Groups of teachers discuss these aspects within a scientifically rational discourse when discussing what they consider to be good questions and exercises in national tests.

2013-2014. *Green schools' work to become model schools for sustainable development*

Financed by Sida through the World Wildlife Fund (WWF). Research on the implementation of education for sustainable development in WWF's model schools in East Africa (Kenya, Tanzania and Uganda) and Sagar Island, Sundurban, India.

The result shows that the implemented teaching content in an educational project is changed and adapted by teachers to the actual cultural context. The content changes character from an approach for the future to that of solving present needs.

2008-2012. *The Swedish national Graduate school in Education and Sustainable Development (GRESO)*

Financed by the Swedish Research Council. I had a 50 per cent work allocation as coordinator and deputy scientific leader. The host institution was Uppsala University. A research collaboration between eight academic institutions: Uppsala University, Mälardalen University, Lund University, Umeå University, Jönköping University, University of Gothenburg, Stockholm University and Örebro University.

Nine PhD students from nine institutions and several associate PhD students took part in three joint research study courses in Uppsala. The majority have now defended and completed their theses.

2009-2011. *Implementation of education for sustainable development: the relation between normative supportive structures and student's moral learning.*

Financed by the Swedish Research Council. I had 25 per cent research time for the teacher studies. The host institution was Örebro University. A research collaboration between eight researchers from Örebro University, Mälardalen University, Lund University and Uppsala University.

The project studied the work of three upper secondary schools to implement education for sustainable development. The results showed that the school management played a central role in the long-term implementation work. The schools' work to develop new approaches to the teaching of complex social issues required the active participation of experienced teachers. A further result was that student participation in the teaching and learning process did not always lead to a pluralism in the classroom discussions, but could also lead to a conformism and impoverishment of viewpoints.

Per Sund