



**INSTITUTIONEN FÖR KEMI OCH MOLEKYLÄRBIOLOGI**

**LOOK AROUND, WHAT CAN YOU DISCOVER?  
The science center - a critical space for science student teachers'  
development**

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# Abstract

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This thesis aims to examine the opportunities and constraints on student teachers' learning of science and teaching science when they work in small groups; planning, implementing, and reflecting upon teaching at the science center. In addition to this aim, this thesis seeks to identify what becomes critical for teacher educators and science center educators when facilitating experiences that enable student teachers to learn, teach, and integrate science didactics theories into practice.

A body of research demonstrates that practicing science teaching in various out-of-school science environments, i.e., science centers, science museums, botanical gardens, and aquariums, offers many learning opportunities for student teachers. What is distinctive about this thesis is that it examines student teachers' practice at the science center from a subject-specific didactic perspective. This means that it focuses on *how* student teachers handle different aspects of teaching and learning science when they plan, implement and reflect on their lessons at a science center.

The educational context of this thesis is a course module for student teachers. The module was developed by teacher educators at the University of Gothenburg and science educators at the Universeum science center and involves becoming familiar with the science center's exhibitions, as a context in which to plan, implement, and reflect upon short lessons with invited students from schools. The empirical data in the first and second study comprises of video footage focused on student teachers' planning meetings and implementation of the science lessons at the science center. The third, and fourth study, in the thesis are based on so-called 'video-stimulated reflection interviews' with the same student teachers after they have completed the course module at the science center.

The results of this thesis strengthen the notion that an out-of-school science environment, such as a science center, can play a significant role in student teachers' knowledge development in science didactics. However, the thesis highlights the importance of iterative educational opportunities where student teachers can (1) create and reflect on didactical situations and their teaching's relevance structure for the intended group of students. (2) develop representational tools to help students connect the macroscopic and (sub) microscopic worlds of science. (3) discern the possibilities and limitations of the exhibitions in relation to an intended science content, and (4) develop their responsiveness to students' interactions with the environment and how these interactions can be captured in 'teachable moments'. The thesis contributes with knowledge of how a didactic model, the didactic tetrahedron can be used as a tool for student teachers and teacher educators when planning and analyzing didactical situations. Furthermore, in relation to methods, this study demonstrates the ways in which video-stimulated reflection can be used for discussing issues of science didactics, and challenges of integrating theories of teaching and learning in practice in a science environment beyond the classroom.