RECENT DISSERTATIONS

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Budding scientists learn science. A longitudinal study of 10–13 year students' science skills in an inquiry-based context

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Abstract

The thesis is written within the area of science education. It accounts for a survey about how the objectives in the Norwegian curriculum ensures product and process perspectives of science, and an intervention study aimed at developing students' advanced expertise in these perspectives using a long-term inquiry-based practice. The intervention intended to improve students' academic knowledge and skills. To achieve this, the instruction was varied, inquiry-based and inspired by so-called learning progressions.

Learning progressions offers specific paths for students to follow in order to gain deep understanding of scientific product and process. The students' learning processes in science products and processes were examined, and a question about how the long-term inquiry based practice influenced their learning processes was raised. The study was mainly directed against four students in a class during two years (aged 10/11–12/13), and data consists of videos from instruction, interviews and student work.

The analysis of the Norwegian curriculum shows that it largely addresses both science products and processes. Results from the intervention study shows that students acquired relatively deep and broad expertise in these perspectives. It seems like diverse teaching with repetition, expansion and refinement of key concepts and theories will help students gain a deep understanding of these concepts and theories. Furthermore, it seems like students connect scientific concepts and theories with scientific methods, as well as reflecting over the scientific methods if this is provided. Instruction was inspired by learning progressions and scaffolding in scientific inquiry, and this may have contributed to the development of students' scientific expertise. In addition, it appears that different perspectives of science products and processes support each other when students learn science. Finally, there are strong indications that scientific inquiry can be a tool to make teaching diverse and more relevant to students' lives and future, while students gain expertise in both science products and processes.

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