

# Upper secondary mathematics teaching and teachers - two Nordic studies

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In two recent doctoral studies on upper secondary mathematics teaching and teachers the researchers are presenting unique findings from Norwegian and Swedish mathematics classrooms. The aim of my paper is to analyse, discuss and compare the results from the two theses, both defended during March 2010.

Per Sigurd Hundeland (2010) investigated the competences of mathematics teachers in Norway and how they justify and emphasise in their teaching. He interviewed three experienced teachers in one upper secondary school at three different occasions over a year's time. He was searching for stable knowledge and beliefs and in what ways the teachers' argued for different choices in their teaching. The teachers were participants in a developmental project aiming to improve teaching and pupils' learning in mathematics. The teachers' voices and perspectives were given priority. The competence model from the Danish KOM-project was used in order to describe what the teachers expressed about their actions in the classroom. What do the teachers say about how students learn mathematics, what teaching methods do they prefer, and what factors do they emphasise in their teaching.

The study reveals that there are several factors that can be seen as institutional constraints. One dilemma expressed, consists in the decision about how to use time and how to meet individual students needs. The evaluation system restricted the opportunities to teach in the ways the teachers would prefer. The examination system steered their choices of content to work with. Teachers preferred to be active and take responsibility as teachers. A task-discourse (Mellin-Olsen, 1991) was visible in the teachers' work and they used many colourful metaphors in the professional language.

The study carried out in Sweden by Per Eskil Persson is a longitudinal study of two sets of classes over three years each. The study aims at ways to improve algebra teaching and learning at upper secondary level. In a broad approach both cognitive and effective aspects are considered. Data was collected over four years and consists of mathematical tests, classroom observations, field notes, interviews and surveys. Students' knowledge and skills in algebra, their development of knowledge at different points of time and their attitudes towards and beliefs about algebra were studied. Five main factors for success in algebra were identified. The author also studies his own development over time from being a normal school teacher to become a teacher researcher and finally going into doctoral studies. The double role of being a teacher and researchers and the advantages and risks of it is carefully discussed.

The role of using calculators and computers in teaching and learning algebra is investigated deeply through a careful review of research. The results from the study are taken as a starting point for a thorough discussion about teachers' need for competence development and in-service training. Advice is given to teachers about methods and ways for local development projects in schools. Finally new routes for continued research are sketched.

## References

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