Technology and Teacher Competence

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This section focuses on the following aspects of technology teachers' competence: Preschool teachers' support by their principals in ensuring that the teachers teach according to the national curriculum goals; junior secondary teachers' perceptions of using models; teaching modelling using digital design tools in junior secondary; junior secondary teachers' cognitive academic language proficiency (CALP) where mainly ESL learners are being taught technology in English; and upper secondary teachers' attitudes towards teaching technology as an elective.

Pernilla Sundqvist explored preschool principals' perceptions of technology and technology education. She found that their perceptions of technology varies between a narrow view of technology as only being artefacts, or a great insecurity entailing not knowing what separates technology from natural science, and a developed and complex view of technology. According to the principals the preschool teachers' competence demands a high level of subject knowledge.

Björn Citrohn and Maria Svensson investigated how Swedish junior secondary technology teachers perceive the use of models. It was found that they mainly relate the use of models to an intentional (functional) nature which indicates that there are model functions that they do not perceive at all or only perceive to a limited extent. This could have a negative effect on the possibilities for students to understand and learn about complex technological relationships and phenomena, as well as for the students' ability to solve problems.

Helen Brink, Nina Kilbrink and Niklas Gericke researched Swedish junior secondary technology teachers' experiences of gaining more understanding in teaching modelling using digital design tools. They found that the teachers teach modelling by using digital design tools with different aims; and that the intended object of learning differs. The findings also indicate that teachers experience that they lack knowledge of teaching modelling using digital design tools and therefore have difficulties teaching in this area, which can affect the students' development of problem-solving skills negatively.

Jan Ardies, Piet Ankiewicz, Nele De Witte and Eva Dierickx are involved in a pilot study to improve the number of students opting for technology-related subjects in upper secondary school. One reason for the few students pursuing these subjects is the difficulties many of them have with English as the language of teaching. In Flanders the STaalvaardig project operates in a context where about 20% of the students' mother tongue is different from the language of teaching. As a result of an online professional development programme, Flemish teachers have become more aware of their cognitive academic language proficiency (CALP). It is argued that the best practices of the STaalvaardig project may hold affordances for a similar project within the South African context.

Caroline Forsell studied the attitudes of Swedish teachers who teach introductory solid mechanics as an elective in upper secondary school. The findings show that those teachers who taught solid mechanics did so through personal choice with a high self-efficacy and low anxiety regarding the subject. Those who did not teach solid mechanics omitted it mainly because of a lack of knowledge. The study thus indicates that technology teachers' attitudes towards various engineering disciplines may affect their teaching.