In today's knowledge society, succeeding in work and life in general calls for so-called 21st century skills, i.e., skills for learning, creative and critical thinking, collaboration, and the ability to take advantage of ICT in these areas. From this perspective teacher education has a significant role in preparing pre-service teachers with adequate 21st century skills. The current way of working in teacher education does not match to the needs of the 21st century learning environments, such as inquiry and student-centered approaches and the use of ICT (social media, wikis, blogs, mobile technology) in learning. These, in turn, require students to have skills for self-regulation, collaboration and ability of using ICT in teaching and learning as well as positive attitude of ICT in rapidly changing society.

So far we do not have systematic and long-term research on the impact of different pedagogical approaches on the 21st century skills and attitudes, especially not in teacher education. According to our current understanding, we have identified three main challenges in developing teacher education: need for supporting and assessing teacher students' (1) strategic learning skills, (2) collaborative problem solving skills, and (3) ability to use ICT in teaching and learning, and beliefs and attitudes towards ICT. The aim of the PREP21-project is to investigate and outline factors that affect the development of students' strategic and collaborative problem-solving skills and their competencies and attitudes towards the use of ICT in teaching and learning.

In the longitudinal study, including large-scale, process-oriented and outcome data, we are able to outline the factors affecting the development of future teachers' skills, competencies and attitudes in the long run. Altogether the longer term goal of the project is that teacher education units are able to provide their students with better abilities and readiness to use ICT in a pedagogically meaningful way, to provide their pupils with skills of 21st century. The results of this project will be used for developing Finnish teacher education, and schools, to better respond to the demands of the 21st century.

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