



# PREP21

## Preparing teacher students for 21st century learning practices Ways of thinking and working

Arto K. Ahonen<sup>1</sup>, Kati Mäkitalo-Siegl<sup>2</sup>, Päivi Häkkinen<sup>1</sup>,  
Sanna Järvelä<sup>3</sup>, Piia Näykki<sup>3</sup>, Teemu Valtonen<sup>2</sup> & Erkko Sointu<sup>2</sup>  
University of Jyväskylä<sup>1</sup>; University of Eastern Finland<sup>2</sup>; University of Oulu<sup>3</sup>  
arto.k.ahonen@jyu.fi, kati.makitalo-siegl@uef.fi

Further information: [prep21.wordpress.com](http://prep21.wordpress.com)

### Background

Teacher education has a significant role in preparing pre-service teachers with adequate 21st century skills, i.e. skills for learning, creative and critical thinking, collaboration, and the ability to take advantages of ICT. However, the current teaching practices do not often respond 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). These, in turn, require teacher students to have skills for self-regulation, collaboration and ability of using ICT in teaching and learning. There is a lack of systematic and long-term research on the impact of different pedagogical approaches on the 21st century skills and attitudes, especially in the teacher education context.

### Aim

Based on the current research evidence, we have identified *three main challenges* in developing teacher education: need for supporting and assessing teacher students'

- strategic learning skills (O1),
- collaborative problem solving skills (O2) and
- ability for using ICT in teaching and learning, and beliefs and attitudes towards ICT (O3).

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.

### PREP21 Pedagogical Model

This project will focus on the process of inquiry from a pedagogical perspective (see Figure 1), and it will be treated as a method for structuring activities in the classroom, especially focusing on problem-, project- and case-based learning approaches. This research is based on the assumption that ICT-based inquiry learning methods can enhance students' strategic learning skills, and collaborative problem-solving skills, as well as their skills and a positive attitude towards using ICT in teaching and learning.



Figure 1. PREP21 pedagogical model

### Methodology

The data collection starts with the first-year students (each year during the four-year funding period) who begin their primary teacher education. The number of participants will be based on the amount of starting places in three universities, in total  $N=1280$ /four-year period.

The embedded research design involves two main components (see Figure 2):

1. A longitudinal follow-up of four years on strategic learning skills, collaborative problem solving skills and skills of ICT use (especially integration of technology and pedagogy) and attitudes towards ICT to capture the growth patterns and student profiles in these areas.
2. Process-oriented experimental designs with a mixed method approach for a period of two years to understand the background and reasons for possible differences in growth patterns and profiles.

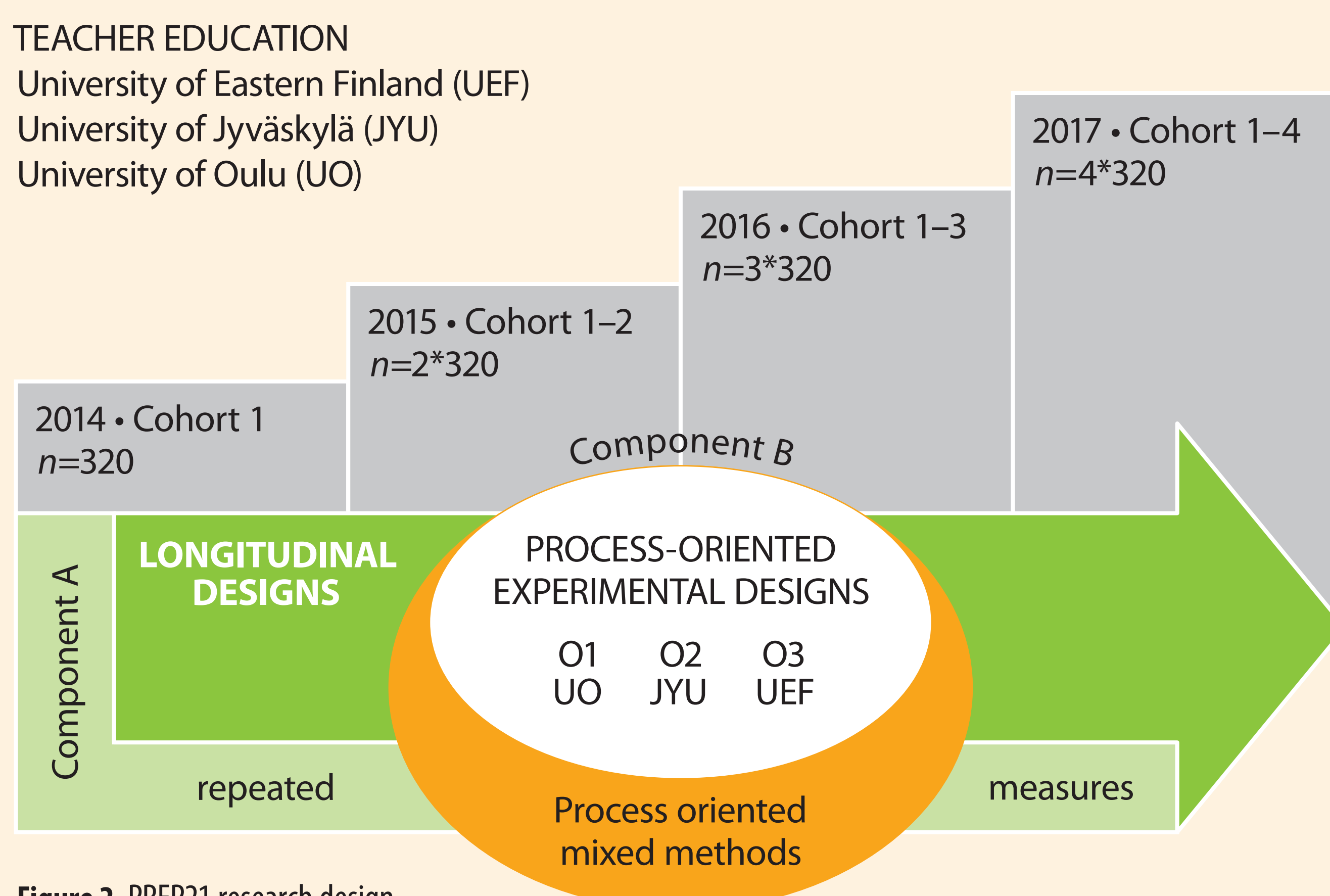


Figure 2. PREP21 research design

### Experimental designs

The conditions of the experimental designs in each university fulfill the following criteria:

1. *Pedagogical course designs* are based on sustainable theoretical background in learning science; inquiry-based and collaborative learning approaches are expected to foster problem-solving competencies and strategic learning skills.
2. *Focuses in pedagogical designs* are based on theoretical and methodological expertise in different universities (e.g. collaborative problem-solving skills, strategic and regulatory skills).
3. *Learning tasks* are typically complex, open-ended and inspiring.
4. *ICT* is intensively used (computers, tablet PCs, personal mobile devices, interactive whiteboards and tables, social media, wikis).

### Expected outcomes

1. Empirically tested knowledge about the influence of different pedagogical approaches on students' strategic skills, collaborative problem-solving skills, attitudes and skills in the use of ICT in teaching and learning.
2. Long-term follow up data and methods for:
  - the evaluation of teacher education effectiveness,
  - creating sustainable high quality practices to teacher education
  - providing insights into the development of student teachers' 21st century skills and the methodology for investigating these skills.