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Designing professional development for mathematics teacher educators

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Two decades ago, Tzur (2001) was surprised to notice that research on development of mathematics teacher educators was almost non-existent. More recently, Lloyd (2020) notes that research on mathematics teacher education still tends to emphasise the prospective teachers or participating teachers more than the mathematics teacher educators. Still, there is little support for teacher educators, and no common education for mathematics teacher educators. MatRIC, which is a Centre for Research, Innovation and Coordination of Mathematics Teaching in Norway, has collaborated with the Norwegian Centre for Mathematics Education to develop a national study programme for mathematics teacher educators. The study programme is designed to be two academic years, part-time and gives 30 ECTS points. This poster presents the design of this programme.

The study programme is designed to include teacher educators with varied backgrounds, so that they together can work and develop their teaching of pre-service teachers in collaboration. The pilot of the programme started in August 2021, with 26 participants from twelve different teacher education institutions in Norway. Some participants have PhD's in applied or pure mathematics, but little or no experience from teaching mathematics in schools. Other participants have taught mathematics in primary or secondary school for many years but have less formal education in mathematics. We brought them all together with the aim of developing their teaching of pre-service teachers in mathematics in collaboration.

The education of mathematics teachers involves mathematics as a scientific field, the practice field, and the mathematics education research field. The goal of this programme is that teacher educators will develop the competence to establish strong(er) connections between these three fields. Participants in this programme will gain insight into central mathematical ideas and central themes in mathematics education. Furthermore, the programme will engage participants in research into a variety of approaches for mathematics teacher education. In collaboration, participants will discuss and research mathematics teacher education, and the goal is for participants to develop their own practice as mathematics teacher educators. Participants will undertake a research and development project with their own pre-service teacher students. This will entail the development of research design, generation and analysis of data, and the production of a research article.

The programme in Mathematics Education for Teacher Educators is divided into four parts.

Part 1: Mathematical thinking in the foreground. Participants will collaboratively:

- investigate “big” ideas in mathematics (e.g., functions, associative property, relation)
- investigate pre-service teacher’s understanding of big ideas in mathematics and relate these to pupils’ learning
- investigate teaching of big ideas in mathematics teacher education – and relate these to pupils’ learning

Part 2: Practice in the foreground. Participants will collaboratively:

- investigate the nature of mathematics teachers’ practice and how this may be developed
- investigate practices in teacher education that support the development of meaningful engagement in mathematics for pre-service teachers and pupils – and relate these to pupils’ engagement, learning and experience
- analyse, reflect on, and develop teaching and mentoring in mathematics teacher education

Part 3: Research (mathematics education) in the foreground. Participants will collaboratively:

- Investigate some major research themes in mathematics teacher education, for instance through self-study or action research
- Reflect about how research in mathematics teacher education can be applied in participants’ own teaching in mathematics teacher education
- Investigate and reflect about how one’s own research can be integrated within teaching and supervising in the education of pre-service mathematics teachers

Part 4: Individual research project. Participants will collaboratively:

- Research and undertake systematic inquiry into their own practices
- Author texts that can be further developed into publishable articles
- Discuss and contribute towards each other’s research projects and texts

The quality of the study programme – in particular how it was received, and to what extent participants consider it relevant for mathematics teacher educator practice – will be evaluated and explored by conducting interviews and questionnaires among the participants, in addition to the reports and research articles written by the participants. The first cohort of the programme is considered a pilot, and it will be evaluated and further improved. However, this is a study programme which is designed to be able to last beyond the extra funding from MatRIC on the pilot, and where the teacher institutions see the value in investing this for their employees.

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