

THEMATIC WORKING GROUP 12
FROM A STUDY OF TEACHING PRACTICES TO ISSUES IN TEACHER EDUCATION

Barbro Grevholm

Agder University College, Norway

Ruhama Even

Israel

Juliana Szendrei

Hungary

José Carillo

Spain

Group 12 was organised by Barbro Grevholm (coordinator), Ruhama Even, Juliana Szendrei and José Carillo (who could not take part in the conference, but took part fully in the preparations). The group had 31 participants. Eighteen papers were submitted to the group. For the review process the papers were organised in five groups with three or four papers in each group. Each paper was reviewed by the two or three other author teams in each group and by one of the group leaders. After the review process thirteen papers were accepted for presentation in the group and three were suggested for poster presentations. Group 12 is a continuation of the work of group3, Theory and Practice of Teaching from Pre-service to In-service Teacher Education, in CERME2, lead by Fulvia Furinghetti.

Here is the list of accepted papers in group 12:

1 Inheritance problems in Arabic algebra treatises. Can they stimulate future teacher's beliefs about mathematics?

Jordi Deulofeu and Lourdes Figueiras

2 Student assessment: issues for teacher education

Ruhama Even and Tali Wallach

3 Improving teachers' ability to cope with problematic learning situations - The case of Eti

Hagar Gal

4 How do prospective primary teachers assess their own mathematical knowledge?

Maria Goulding

5 Reflection, Identity and Belief Change in primary mathematics

Jeremy Hodgen

6 Teachers' interventions in students' mathematical work: A classification

M. Kaldrimidou, H. Sakonidis, M. Tzekaki

7 Changing Teachers' beliefs about' students' heuristics in problem solving

Boris Koichu, Abraham Berman and Michael Moore

8 Future middle school teachers' beliefs about Algebra: Incidence of the cultural background

Nicolina A. Malara

9 A Teaching Resource for teacher training

Daniela Medici and Maria Gabriella Rinaldi

10 Towards a pedagogy of teacher education: from a model for teacher transformation

Stephanie Prestage and Pat Perks

11 Setting a new curriculum in a classroom: variability and space of freedom for a teacher

Laetitia Ravel

12 Elementary teachers' mathematics content knowledge and choice of examples

Tim Rowland, Anne Thwaites and Peter Huckstep

13 An experience in distance in-service teacher education

Leonor Santos and João Pedro da Ponte

In the preparations for the working group we decided to group the papers according to a tentative model of how teacher education can be interpreted as the development of a professional identity for the teacher.

The picture below is a concept map of this model of teacher education in mathematics. Barbro Grevholm developed it as a consequence of research on teacher education during 1996-2002.

Teacher education takes place in a local and national context and in a social and cultural frame, which is not exposed in the picture but is clearly present and will be taken into account in the work.

We investigated how the papers of group 12 fitted into this model.

An interpretation of the papers gives the following (when we look for the main message of the papers):

One paper concerns an organisational form for teacher education. This is the paper by Leonor Santos and João Pedro da Ponte about distance learning.

Two papers concern the personal view on and beliefs about knowledge and learning: the papers by Boris Koichu, Abraham Berman and Michael Moore and by Jeremy Hodgen.

Four papers concern knowledge about the classroom management, methods and material namely the papers by Laetitia Ravel, by Hagar Gal, by M. Kaldrimidou, H. Sakonidis, M. Tzekaki and by Daniela Medici and Maria Gabriella Rinaldi

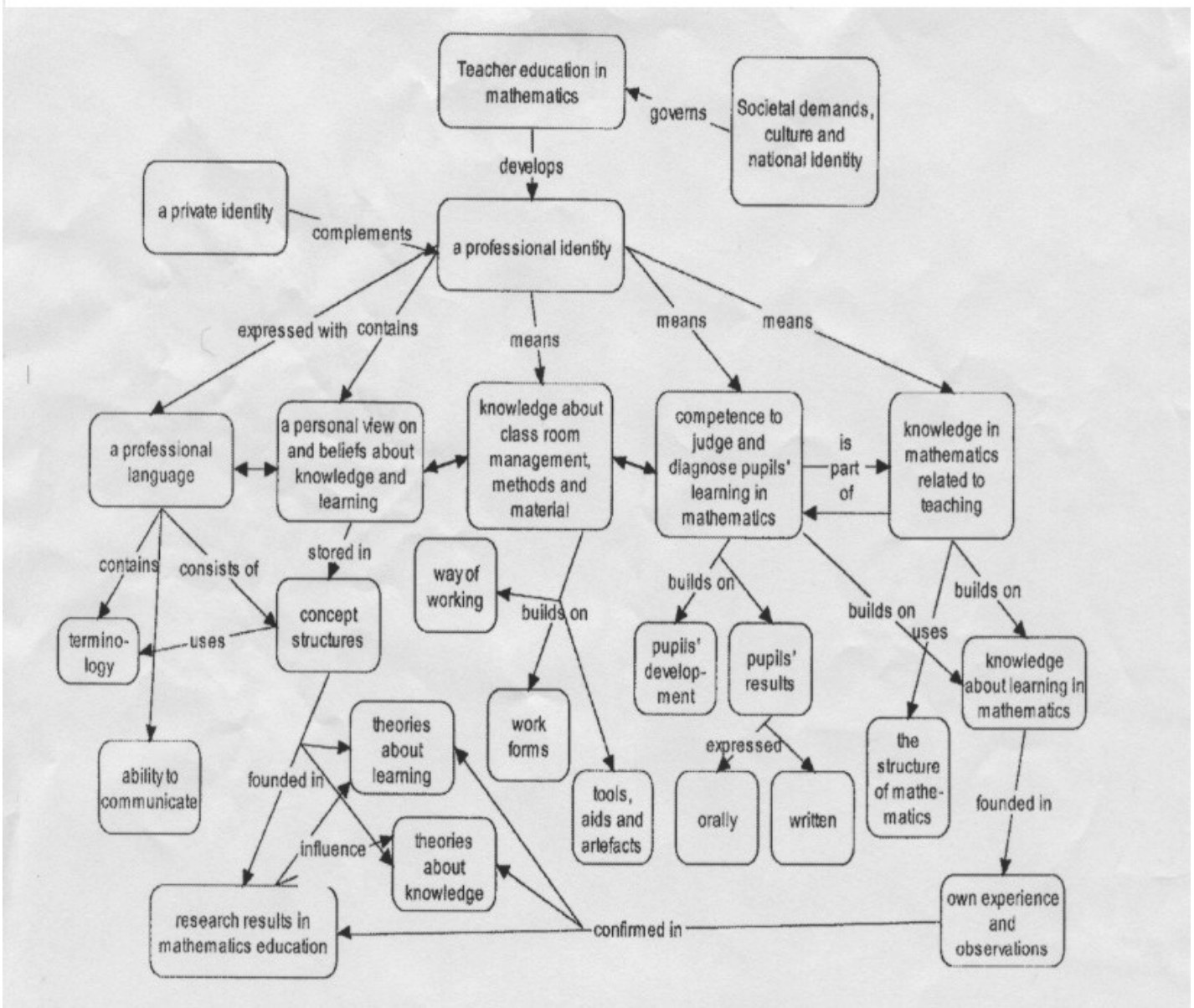
One paper, Ruhama Even's, is about competence to judge and diagnose pupils' learning in mathematics.

Five papers concern knowledge in mathematics related to teaching and they are in two groups:

The papers by Tim Rowland, Stephanie Prestage and Pat Perks and by Maria Goulding are about subject matter knowledge generally.

The papers by Nicolina Malara and Jordi Deulofeu and Lourdes Figueiras are about subject matter knowledge in algebra.

The papers were grouped in three parts and one session was used for each group.

Figure 1: Teacher education interpreted as development of a professional identity.

Two group sessions were planned to be used for common questions and issues and a summary and overview of the group work.

The work was focused on the papers of Santos, Koichu, Hodgen and Even at the first part of the group sessions, the papers Ravel, Gal, Kaldrimidou and Medici at the second part of the group sessions and the papers Rowland, Prestage, Goulding, Malara and Deulofou at the third part of the group sessions.

The group leaders formulated four questions based on the papers that were used as overarching issues in the sessions.

Some questions concerned where we were aiming in the group. How can we create an overview of the knowledge in a certain area and where do we want to expand our knowledge? How are the findings in the papers related to each other. Are they consistent or do we have contradictory results? How can the findings influence teacher education in the future? There are parts of the model that is not touched upon in the papers. Why is that? Do we have blind spots to cover? Of course some of the papers concern more than one part of the model. For example the papers of Kaldrimidou and Even have something to do with teachers' professional language and there are other similar cases.

These are the questions we decided to bear in mind during the work in group 12:

- 1) What is the nature of the relationships between what we know about teaching practices and what is done or studied in teacher education? What do we know or need to know about teaching practices to develop better teacher education programs/to study different aspects? What do we know or need to know about using our knowledge about teaching practices to conduct better teacher education/study different aspects?
- 2) What do we know or need to know about the opposite direction: from a study of teacher education to issues in teaching practices? Or, what might be the relationships between teacher education and teaching practice? What kind of evidence can we provide to show that teacher education is worth the time and money invested in it? What kind of evidence do we not have but need to have in order to communicate with different people, like policy makers?
- 3) What is the connection between teachers' development of a teaching practice and pupils' learning in mathematics. Is there a link between teachers' learning during teacher education and pupils' learning during the teaching practice? How can we learn more about the relation between pupils' learning and teachers' teaching in order to assist both groups to improve the result? What do we mean by improving the result of teacher education or teaching practice or pupils' learning of mathematics?
- 4) What does evidence mean in the field of research on teacher education? What kind of evidence can we get in it?
 - A. How can we get evidence?
 - B. How have the authors of the papers in our group dealt with evidence in them?

During the group work there were two concepts that came up more often than others: teacher identity and teacher roles. In the discussion participants tried to argue for one

or the other of these concepts. Several of the papers used on or the other of the concepts.

The following questions were raised in WG3 in CERME2 (reported by Fulvia Furinghetti and Barbro Grevholm):

- A lot of different and complex issues came up but no issue stood out as of primary importance.
- Relations between pre-service and in-service training. Is the difference going to disappear when we get life-long learning?
- The role of mathematical knowledge and the balance between subject knowledge and pedagogical knowledge.
- Relations or differences in issues at primary and secondary level.
- Would the discussions in our group have been different if we were educators only and not researchers?
- Relationships with institutions and the political influences on our behalf.
- The need to define in every paper a local meaning of central concepts (like reflection, improvement, changes, and development).
- The effect on teachers of stimuli like writing, reading, and technology.
- Teachers' awareness, teacher students' awareness.
- The role of discussion, conversation, communication in promoting professional growth.
- Is the role of technology less strong than in earlier phases?

Some of these questions were included in the discussions in CERME3 but not all of them. On the other hand additional questions were raised by the papers and participants in CERME3. The picture of research in mathematics teacher education that evolved during the working group is complex and built by many nested problem areas. Further work is obviously needed before we can discover areas where consistent and well founded results inform us about theories and practices in teacher education.

The invitation for group 12 in CERME3 was for research- or development based papers on the study of teaching practices to issues in teacher education, including questions concerning the teachers work from all aspects.

Particular interest was expressed in theoretical, empirical or developmental papers that address one or more of the following themes:

- The nature and development of teacher knowledge.

- The relationship between teaching and learning in mathematics.
- The role of computer-based tools in teacher education and teachers' work.
- The elaboration of theoretical frameworks that may provide insightful models for interpreting evidence from research on pre- and in-service education and teachers work.

The third aspect of these four did not take up much interest in the group work. One reason for that might be that other groups were dealing with this issue. Theoretical frameworks that could provide insightful models were not common either. Many of the studies were carefully looking at one specific issue and trying to go deep into it. As a result of this fact it is not easy to see a broader picture or fit the different studies together in a coherent overview. There is a need for further work in CERME4 on issues on teacher education and development.

This introduction was written by Barbro Grevholm and it is based on the collaborative work of the coordinator and the group leaders of TG-12 in planning and implementing the working group.

[List of contributions](#)

[List of Thematic Groups](#)