Mathematical Knowledge for Teaching as the Object of Learning in a Learning Study

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I would like to present the final results of a conducted Learning Study, of which the design and the pilot were presented at WALS08 and WALS09. The aim of the study was to find a way to teach Mathematical Knowledge for Teaching (MKT) so that student teachers would use aspects of MKT in planning their teaching. The study focuses on 5 aspects of MKT: curricular goals, preconceptions, models of explanation, exercises, and hands-on materials. Teacher educators, who previously experienced that student teachers could list some aspects but could not relate these in a relevant way, conducted the study at a pre-service teacher training.

The data were analysed with help of Variation Theory and four critical features were found concerning the Object of Learning – MKT. Student teachers needed to look upon the curricular goals as a document to choose appropriate elements from, not as a whole package to work with in one lesson (1). In order to be able to reflect from a teachers’ perspective, a contextual experience has to be created (2). Furthermore, describing single aspects of MKT in detail generated relevance between these aspects (3). Finally it appeared that the underlying mathematics had to be understood when discussing an activity from a teachers’ point of view (4). These four critical features were implemented in the study and a clear improvement in the way the 5 aspects were addressed by the student teachers. One unique aspect of this study is the design: instead of teaching the same lesson through altering the groups, we now-taught the same group but altered the mathematical content of the lesson (but keeping the Object of Learning the same).

In the presentation I will present my results and look into consequences and opportunities for such a design.