MATHEMATICAL NETWORKS AND THEIR TRANSFORMATION IN TEACHING AND LEARNING PROCESSES

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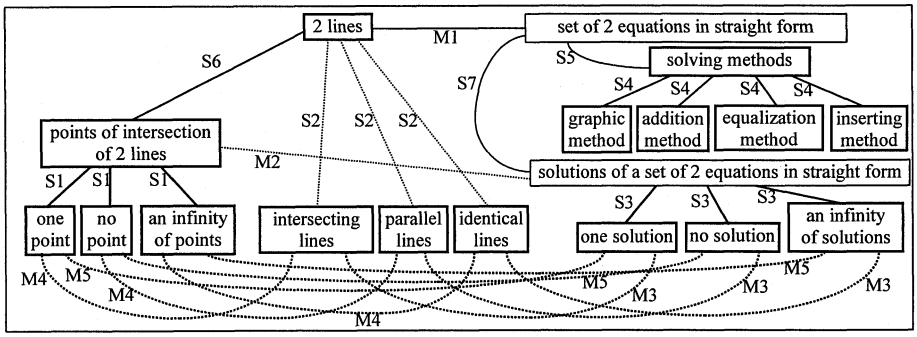
This contribution presents part of a study with the aim to investigate how a mathematical network as it is stated by teachers to have been presented in middle grade classes is transformed when carried over into students' minds. The study particularly focused on the topic "sets of two equations in straight form" and restricts on the investigation of some network relations according to subject systematics and a special relation according to the application of mathematical objects, the model relation. (For the definition of main network categories with relevance for mathematics education in school see Brinkmann, 2001.)

The participants of the study were 3 experienced and proficient teachers of different schools in Germany and altogether 137 of their students. The teachers' statements in respect to the network they implemented in classroom were investigated by interviews. In order to map out the networks learned by students, there were developed tests demanding from students activities closely related to those of concept mapping.

The figure below shows the network teachers stated to have taught. Those linkages that turned out in the tests to be achieved only by less than 50% of the students are drawn with interrupted lines. The different links according to subject systematics are marked with S, model links with M.



The study reveals the incompleteness of the transfer of implemented networks into students' minds. The mainly learned connections by students are part of the links according to subject systematics, model links are hardly known. Conclusions in respect to the teaching of the different sorts of connections have to be drawn.

References

Brinkmann, Astrid. 2001. „Mathematical Networks – Conceptual Foundation and Graphical Representation." In: Riitta Soro (ed.). *Current State of Research on Mathematical Beliefs X. Proceedings of the MAVI-10 European Workshop in Kristianstad, Sweden, June 2-5, 2001. University of Turku, Department of Teacher Education, Pre-Print nr. 1, 2001,* 7-16.