MATHEMATICS TEACHERS' UNDERSTANDING AND INTERPRETATION OF THEIR OWN LEARNING AND CLASSROOM PRACTICE

Malin Lindwall Ehrnlund

Department of Teacher Education, Halmstad University, Sweden

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SUMMARY

Educational systems around the world are at the moment in the center of numerous reforms in order to improve schools and students achievement (Roesken, 2011). In the Swedish context the reforms requires interpretation and implementation of changed curricula grounded in learning and teaching paradigms that may challenge and question mathematics teachers´ present beliefs and teaching practices. In order to meet these requirements teachers play a central role in gaining adequate professional development; to participate in and obtain qualified and continuing learning opportunities (Borko, 2004). Several contextual conditions are identified by international research as promoting principles for teacher learning; i.e. providing ongoing opportunities for teachers to collaborate and learn together, content focused school-based professional developmental activities based on experiences and incorporating inquiries into teachers own practice and learning (Loucks-Horsley, Love, Stiles, Mundry & Hewson, 2010, Borko, 2004). The aim of this study is to examine Swedish mathematics teachers understanding and interpretation of their own learning and classroom practice during learning activities designed according to the consensus criteria mentioned above.

Two teachers in a local mathematics team participated in a 3 year-long PD-project, initiated by the teachers, the school-leader and a local resource teacher, who also joint facilitated the learning activities. The PD-initiative was raised after mutual identification of an escalating need for improving students result in mathematics. The intervention was designed by the researcher, the teachers, a resource teacher and the school leader and consisted of further improving the mathematics teachers' content knowledge and pedagogical knowledge through a number of PD activities (i.e. workshops, network meetings, collegial reflections) on a regular basis.

In 2010 semi-structured interviews with two participating teachers were conducted and video-recorded in order to capture the teachers' understanding and interpretation of their classroom practice and their own learning needs. During 2010 and 2011 artifacts were collected from practice, for example classroom videos of teaching sequences concerning number sense and arithmetic, students work, assessment data, teachers planning. In 2012 Video Stimulated Reflection (VSR) was used on the same participating teachers. Through VSR, supplemented with artifacts from practice, the participating teachers collaboratively reflected upon the film-clips from 2010

concerning (a) the classroom practice and (b) their own pedagogical reasoning as mentioned above.

Preliminary findings indicates (and to some extent confirms previous research) that in this meta-cognitive process of sharing reflections on authentic video-recordings, supplemented with other artifacts from practice, the teachers interpret their own learning and classroom practice and become aware of their own progress and learning needs. They also re-interpret the students' conceptual understanding, learning and learning needs. The collaborative conversations and the contextual setting of the intervention seem to be motivators and key-factors for establishing a systematic approach to teachers' reflection on their own practice, teaching concerns and needs in relation to their students' learning needs. *During the early spring of 2013 the interconnected model (Clarke and Hollingsworth, 2002) is adapted to the data in order to analyze the complexity of teachers' professional growth. Also the MKT-model is used as an analytic tool to sort and categorize the teachers' reflections.*

This study has implications for research into the professional learning of mathematics teachers as well as for the design of school-based PD. Even though an international need for mathematics teachers' professional development is identified and expressed, we know little about the precise challenges, needs and possibilities related to mathematics teachers' continuing professional learning in and for practice in local contexts. Jaworski (2011) stresses that "we know much less than we should about teachers' learning from experience; whether teachers learn, what they learn and what supports learning from experience." (p. 11).

REFERENCES

Borko, H (2004). Professional development and teacher learning: Mapping the terrain. *Educational Researcher, 33*(8), 3-15.

Jaworski, B (2011). Situating mathematics teacher in a global context. In Bednarz, N., Fiorentini, D., & Huang, R. (2011). International approach to professional development for mathematics teachers (pp. 2-51). Ottawa: University of Ottawa Press.

Loucks-Horsley, S., Love, N., Stiles, K. E., Mundry, S., &Hewson, P. W. (2010). *Designing professional development for teachers of science and mathematics* (3rd ed.). Thousand Oaks, CA: Corwin Press.

Roesken, B (2011). *Hidden dimensions in the professional development of mathematics teachers. In-service education for and with teachers*. Rotterdam: Sense Publishers.

Clarke, D., & Hollingsworth, H. (2002). Elaborating a model of teacher professional growth. *Teaching and Teacher Education, 18* (pp. 948-967).