Developing the practical knowledge and skills of mathematics teacher

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According to the previous frameworks constructed by Shulman and other people, after team discussion, we think that there are three levels of teachers' knowledge. Medial and microscopic level knowledge have more directly influences on teachers' practices. Teachers' teaching practices also improve their knowledge in turn. Compared to the macroscopic level knowledge, other two levels knowledge are not very theoretical and systematic but they appear in the teaching and have a strong relationship with teachers' performance.

We develop a framework contains three parts of practical knowledge and skills of mathematics teachers, including basic knowledge, teaching process and support system. Basic knowledge is about the knowledge teachers should own for their teaching, some of them are learned, some are formed through experiences, mathematics or non-mathematics. Teaching process reflect teachers teaching practice level in different steps, class preparation, class teaching and class reflection. Support system is about teachers' believes and attitudes.

What are weak for teachers’ practice?
Basic knowledge: understanding of technology, understanding of curriculum.
Teaching process: design teaching context, formative evaluation.
Support system: job burnout

What are important for teachers’ practice?
Basic knowledge: understanding of mathematics, understanding of curriculum, understanding of students and understanding of technology.
Teaching process: design teaching context, solution of, communication skills emergency situations (teach or non-teach), assessment of students, teaching introspection
Support system: positive attitude and confidence to teach