

Hermeneutics as for the Theory of Mathematics Education

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In Japan, Lesson Study is the reproducible science for teachers to produce good practice for children (Isoda, M., to be published, *Dialectic on the Problem Solving Approach: Illustrating Hermeneutics as the Ground Theory for Lesson Study in Mathematics Education*. Proceedings of ICME 12, vol. 2: Regular Lectures. Springer) based on their learning from various theories in their communities. Necessary part of LS is the preparation of subject matter to embed the objective for teaching into the content of mathematics and the well prepared class usually goes on with the clear decision making under the teacher's objective for teaching in relation to the interpretation and assessment of children's response and their interaction on the content against teacher's positive questioning. In the LS processes, teachers, students and observers (involving researchers) are trying to understand each other. Here, we call this activity by the technical term 'hermeneutic efforts'. Through the LS project on the interpretation of the historical textbooks in mathematics (Isoda, M., 2007, *Lesson Study in Teacher Education Programs: How do Students Become Teachers That Implement Lesson Study?* Isoda, M., Stephens, M., Ohara, Y., Miyakawa, T. edited. *Japanese Lesson Study in Mathematics: Its Impact, Diversity and Potential for Educational Improvement*. World Scientific; Isoda, M. (2015). *The Science of Lesson Study in the Problem Solving Approach*. Inprasitha, M., Isoda, M., Wang-Iverson, P., Yeap, B. H. edited. *Lesson Study: Challenges in Mathematics Education*. World Scientific), it is defined by the following four activities: 'just-understanding', 'getting the other's perspective', 'self-understanding by the other's perspective', and 'engaging recursively in making the objective knowledge from the subjective knowledge'.