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Adapting Mathematical Discourse in Instruction Framework for Planning and Analyzing Research Lessons

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In this paper, we report on our use of mathematical discourse in instruction (MDI) framework (Adler & Ronda, 2015; 2017) to analyze and plan the mathematics content of our research lessons. Our motivation in undertaking this activity is to find out how we may adapt the framework to help us think about the mathematics we make available to learn. The use of the framework would also provide some theoretical basis for our instructional decisions in our lesson study works apart from the empirical evidence we gather during the lesson implementation. We think that having a research-based framework is important especially that we do not always have a knowledgeable other from university to help us towards deeper learning out of our lesson study.

The MDI framework is a sociocultural tool for analyzing the quality of mathematics made available to learn in lessons. It consists of six analytic constructs: the object of learning and four instructional tools for mediating the object learning namely tasks, examples, naming or word use and substantiating. It also includes descriptions of the nature of learner participation during the lesson. The framework was introduced to us by the third author of this paper as tool for us to think about our teaching particularly in our lesson study activities. In the study we report here, we sought to answer the questions (1) What is the quality of mathematics we make available to learn in our research lessons? and (2) Which aspect of the MDI framework is helpful and productive for us? Our method involved analyzing previous versions of our research lessons and then use it to inform the revised version for our lesson study. In the presentation, we will illustrate our use of the framework on our research lesson on division of monomials. Our results suggest that there is a need for us to pay attention to our explanatory talk which includes naming or word use to refer to mathematical aspects of the lesson and to making explicit the kind of mathematical substantiation we expect especially in our written research plan. We report the details of our results here together with how we have adapted the MDI framework in paying attention to the mediational tools even in our teaching outside lesson study activity.

References:

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