How Does Lesson Study Transform Teaching and Teachers' Learning?

Two recent randomized, controlled trials of lesson study (supported by mathematical resource kits) have demonstrated significant impact on teaching, student learning. teachers' content knowledge and teachers' beliefs about student learning (Lewis & Perry, accepted; Lewis & Perry, 2015; Lewis et al, under review). How did lesson study produce changes in teaching and teachers' learning?

Drawing on lesson study meeting videos self- recorded by each group, we will examine learning opportunities for teachers, i.e., incidents in which teachers' thinking about the content, instruction, or student thinking shifted in some way. These examples suggest that three elements of the lesson study process worked together to allow changes in teaching and teachers' learning:

1. *Access to knowledge* (of content, instruction, student thinking);
2. *Collaborative structures* (to support risk, push inquiry, challenge ideas, etc.); and
3. *Practice enactment* (trial in the classroom, focus on student responses as the warrant for effectiveness)

A fourth feature, *motivation*, is hypothesized to fuel repeated cycles of lesson study, and to emerge based on lesson study's responsiveness to teachers' human needs for agency, belonging, and competence (Deci & Ryan, 1985).

These studies of impact on teachers' learning and teaching appear at a time of widespread skepticism about the effectiveness of teachers' professional learning. Yet remarkably few professional learning programs combine high-quality knowledge access, collaborative structures, and focus on practice. Since collaborative structures and practice focus are built into lesson study, it may make sense to focus on high-quality knowledge access, and on doing all three features together well.

Deci, E., & Ryan, R. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.

Lewis, C., & Perry, R. (2015). A Randomized Trial of Lesson Study with Mathematical Resource Kits: Analysis of Impact on Teachers' Beliefs and Learning Community. In E. J. Cai & Middleton (Ed.), *Design, Results, and Implications of Large-Scale Studies in Mathematics Education* (pp. 133-155). New York: Springer.

Lewis, C., & Perry, R. (accepted). Lesson study to improve fractions learning: A randomized controlled trial. *Journal for Research in Mathematics Education*.

Lewis, C., Lai, K., Takahashi, A., Watanabe, T., McDougal, T., & Perry, R. Japanese "Teaching Through Problem-Solving" to support U.S. mathematics reforms: A study of instructional impact. *under review*.