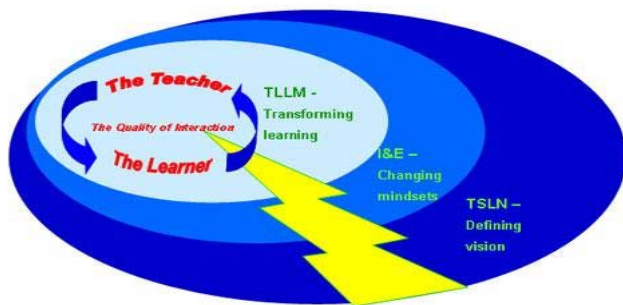


“Lesson Study and the Power of Continuous Improvement – Theorizing in Light of a Singapore Case”

Yanping Fang & Christine Lee
National Institute of Education, Singapore

Presentation at the *Second Annual Learning Study Conference*,
30 Nov – 2 Dec, 2006, Hong Kong Institute of Education

Deepening Process of Educational Reforms



Rich Professional Development Opportunities

Source: MOE, Singapore

Challenges of Professional Development in Singapore Schools (continued)

TRANSFER of learning

- Professional Development = teacher learning = practical application?
- Degree of transfer and application of teachers' learning into practice could be limited

Teams and Research Lessons in Two Lesson Study Cycles (Feb-April & July-Sept, 2006)

SWS	SEED	SAIL
3 rd Grade Math : <i>Long Division with Remainder</i>	2 nd Grade Social Studies integrated with language arts: <i>My Neighborhood</i>	4 th Grade Social Studies: <i>Map Reading</i>
2 nd Grade English Language on Writing: <i>My Hobby</i>	1 st Grade Math: <i>Introduction to Multiplication</i>	3 rd Grade Math: <i>Equivalent Fractions</i>

The Local Context: Curriculum and PD Reforms in Singapore

- Major curriculum reforms, 1997- 2006:
 - Thinking Schools, Learning Nation (TSLN, 1997)
 - Innovation & Enterprise (I & E, 2004)
 - Teach Less Learn More (TLLM, 2005)
- In contrast to an international trend of accountability and control for teacher development in recent years, Singapore has encouraged choice and ownership for schools and teachers to plan and make decisions for their PD workshops and courses.

Challenges of Professional Development in Singapore Schools

Training FATIGUE

- For teachers: Too many initiatives to learn about and to apply
- For school leaders: Hard to manage the distribution of resources (funds) and time allowed for training

Teacher's and school leaders' MANY ROLES

- Teachers' roles: classroom teaching and management duties, administrative tasks, CCA responsibilities, membership of committees, school duties, etc
- School leaders' roles: CEOs, visionary mentors, coaches, entrepreneurs, human resource developers, curriculum leaders, etc.

Lesson Study in Singapore – Our experience with one local primary school in 2006

- Right in time but facing daunting challenges
- Funded by Center of Research on Pedagogies and Practices, National Institute of Education
- Invited to the local school by the Principal – Strong leadership support ...

Learning Points from Cycle 1

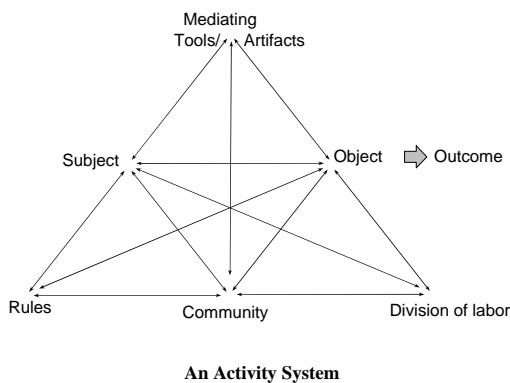
- Deep understanding of LS procedures from learning by doing
- Productive school-university partnership
- Struggled but coped well with the resource-intensive nature of lesson study
- Teachers' positive attitudes towards collegial collaboration when they ventured multiple and competing demands besides regular teaching work.
- Courage of the research lesson teachers in teaching the collectively planned lessons was highly laudable.

Trials and Errors & Improvements in cycle 2

- *Planning was driven by personal habits and focused squarely on lessons.* Use UbD (Understanding by Design) to build unit-view in mind, visualize the assessment outcomes before planning, deepen their curriculum knowledge through curriculum analysis;
- *Subject matter knowledge needs to be deepened.* Earlier involvement of subject experts in guiding planning and teaching;
- Need to constantly check to align lesson goals are with unit goals and long-term school goals
- Need to use pre- and post-tests and student interviews more systematically to get a firmer grasp of student prior knowledge and misconceptions.
- Teachers' observation and note-taking skills need more structure and guidance.
- Use "blackboard writing and arrangement" to organize teaching
- Need to obtain sustained leadership support in realigning school initiatives and providing more support for lesson study in Cycle 2.

Focal Tasks for researchers

- With only one year's experience, we feel strongly about lesson study's power in numerous ways – such as concentrate on student learning and drawing on various resources
- However, the urgency does not seem to lie in analyzing data to identify teacher learning although learning of various levels and kinds has obviously taken place
- We urgently need a set of lenses or tools to help us articulate the power of lesson study and inform our analysis and design for scaling up within the pilot school and build sustainability.

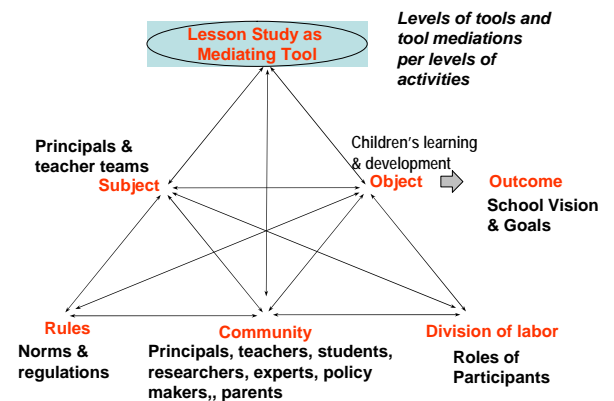


(Engestrom, 1987; Cole & Engestrom, 1993; Jonassen & Roher-Murphy (1999)

Learning points from Cycle 2

- All the major improvements proposed at the end of cycle 1 have been effected in Cycle 2, which produced very structured research lessons;
- Teachers share the consensus about learning more from cycle 2 than from cycle 1;
- School leaders feel strongly about teachers' increased collaboration and awareness of curriculum and student learning
- Among all that reported in the end-of-year survey, the most prevalent learning is in pedagogical content knowledge (learning about student misconceptions, planning with students' needs in mind and build resources ...)
- Time still poses as the most daunting challenge for schools and researchers ...

Using Cultural-Historic Activity Theory to build A School-Based Lesson Study Activity System



Adapted from Engestrom, 1987; Cole & Engestrom, 1993.

Mediations as major building blocks

- In our design for scaling up lesson study intervention, of primary interest is how to sustain our effort by building up a culture of doing lesson study into teachers' daily work lives. So a valuable site of inquiry will constitute **tools and artifacts** used and created in the lesson study process and how they are used in **mediating** the aggregate actions and behaviors of the participants.

- In Vygotsky's work, "the construct of mediation – especially semiotic mediation – played a central theoretical role" (Wertsch et al, 1995, p. 20)..
- "Drawing selectively on insights of both Vygotsky and Leont'ev, the notions of '*mediating means*' and '*mediated actions*' have emerged today as essential building blocks in the formulation of sociocultural research" (p. 21)

Tools, artifacts, mediations and culture...

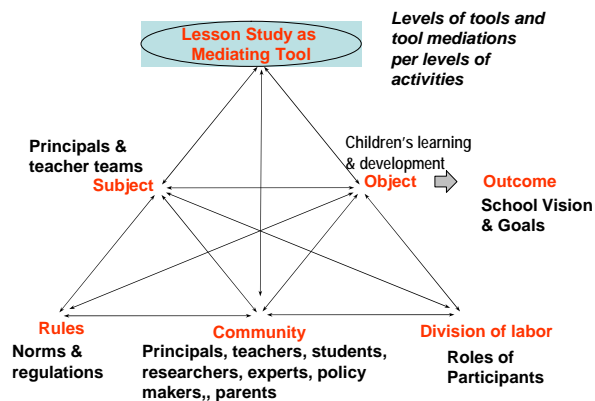
Tools and artifacts “are interwoven with each other and the social lives of human beings they mediate in a seemingly infinite variety of ways. Considered in aggregate, they constitute the unique medium of human life, the medium we know as culture.” (Cole, 1995, p. 191)

Hierarchical Structure of Tools and Mediations

Cole (1995) adopted Wartofsky’s (1979) “three-level hierarchy of artifacts” (p.194) to assist him design the artifacts in his *Fifth Dimension*.

- Primary artifacts directly involved in the production of an activity or activity system, such as hammers, needles, computers and in our case, the white board, paper and pencil, teaching instruments, etc.
- Secondary artifacts or cultural models constitute the representations of the primary artifacts and how the artifacts are used. In lesson study, examples include curriculum, textbooks, standards, worksheets, problems, theories and so on.

“Secondary artifacts play a central role in preserving and transmitting modes of action.” (p. 195)



School as a Lesson Study Activity System

Adapted from Engestrom, 1987; Cole & Engestrom, 1993.

Example One: Within and across routine activities of one lesson study cycle

Nature of Mediations

Mediation through tools and artifacts:

- is *active* in nature;
- has “*transformatory capacities*”; and
- is both “*empowering and constraining*” given the inherent limitations of any form of tools and artifacts from a *developmental* point of view. (Wertsch et al, 1995, p. 24)

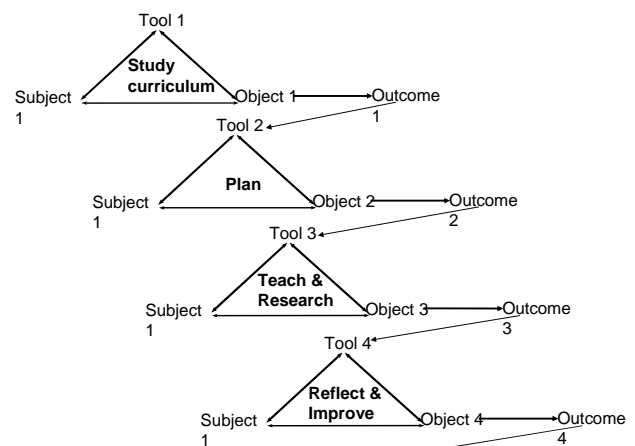
- Tertiary artifacts are imaginative artifacts that “constitutes a relatively autonomous ‘world’, “an arena of non-practical, or ‘free’ play or game activity”. Cole regards his *Fifth Dimension* as a tertiary artifact.

“In modern psychological jargon, modes of behavior acquired when interacting with tertiary artifacts can transfer beyond the immediate contexts of their use” (p. 195).

- Lesson study is a tertiary tool to mediate teachers’ professional learning in the workplace.

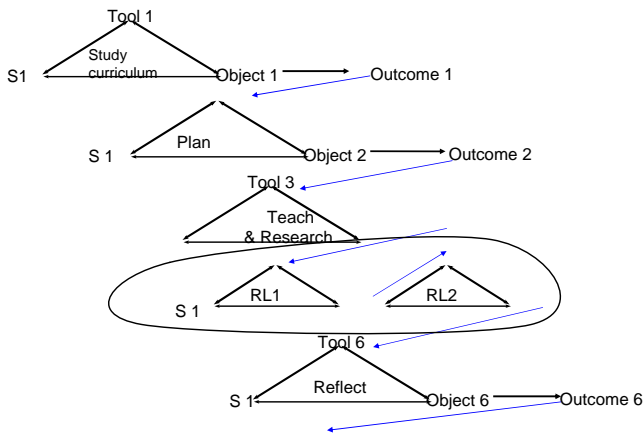
Resources for preserving
engaged pedagogical reasoning and action
---Tool improvement and mediations

Two examples of analysis to inform our
analysis and design



Insights to inform our analysis and design

- The power of LS lies within this iterative, interwoven transformations of tools and mediations in the connected activities; for teachers to benefit from LS, they have to go through each activity in very solid and well-articulated ways. In this sense, the object of each activity should meet acceptable standards for it to inform and transform the immediate artifacts in other activities. So we create checklist (Lewis, 2006)?



**Example Two:
Between and beyond the research Lesson 1
and the revised lesson**

**Primary artifact variations
–two brief video clips**

Transforming Primary artifacts into secondary artifacts

Selected Video Segments of RL 1 and Revised RL – *Division with Remainder*



Group task involve use of manipulatives ($27 \div 2$)



Group task - use of manipulatives ($23 \div 4$)

Selected Video Segments of RL 1 and Revised RL – from *Writing about Your Hobby*



Big Book Shared Reading



Big Book Shared Reading

Insights to inform our analysis and design

Transforming Primary artifacts into secondary artifacts and make alive and preserve the involved pedagogical reasoning and actions

- There are many such little snapshots of primary tools used in RL1 and reused creatively in RL2. The improvements made in their use often involve collective pedagogical reasoning and actions in revising discussions. If we record them in videos or written cases and use them for analysis, reflection and training functions, they will transform from short-lived actions or halflives into rich and valuable resources.

Restore life to the enacted and polished secondary artifacts:

- Secondary artifacts, such as unit/lesson plans, pre- and post tests, and student work, have recorded numerous routes of thinking and decision making in the process of their making. Yet, these routes and meanings become hidden or no longer explicit when they become polished sharable “final products” (for instance, those published on the web). To make these secondary artifacts preserve and transmit the modes of reasoning and actions compressed in the process, we need to record those processes of their making.

Learning theories by doing it ...

- We learned a lot about variations made in RL1 and RL2 and their powerful contributions to the resources of effective lessons study. In both of the above examples of analysis, our learning about variation theory came about inductively through analysis and reflection rather than being taught deductively. We think that learning by doing and reflecting from artifacts of research lessons are more effective ways of learning the theory. This applies to our controversial use of UbD in planning in Cycle 2.
- Sociocultural frame of cognition preclude that learning needs to proceeds acting or doing ...

Help us!

- Time still poses as the most daunting challenge for schools and researchers ... One possibility is to have only one research lesson but to imagining variations and giving their rationale for RL2.
- We are ignorant of the variability of models and their effectiveness. Can we compromise? If so, how?