DG7: IMPROVING TEACHER PROFESSIONAL DEVELOPMENT THROUGH LESSON STUDY

Co-Chairs:
Toshiakira Fujii, Tokyo Gakugei University, Japan
Akihiko Takahashi, DePaul University, U.S.A.

Team Members:
Susie Groves, Deakin University, Australia
Yo-An Lee, Sogang University, South Korea
The key questions to be addressed by DG7

A. What are the key elements of Lesson Study that can help teachers gain mathematical knowledge for teaching?

B. What are the key elements of Lesson Study that can help teachers develop expertise in teaching mathematics effectively?

C. How can an established effective professional development model such as Lesson Study be translated for use in different cultures?

D. How can a professional development model such as Lesson Study be adapted for use in pre-service teacher education?
Session 2 (Saturday, July 14)

Key Questions
C. How can an established effective professional development model such as Lesson Study be translated for use in different cultures?
D. How can a professional development model such as Lesson Study be adapted for use in pre-service teacher education?

• Chair: Akihiko Takahashi (Co-Chair)
• Discussant: Lim Chap Sam, Universiti Sains Malaysia, Malaysia
• Panel:
  – Anika Dreher, Ludwigsburg University of Education, Germany (C)
  – Thomas Ricks, Louisiana State University, U.S.A. (C)
  – Berinderjeet Kaur, Nanyang Technological University, Singapore (D)
  – Don Gilmore, The Metropolitan State College of Denver, U.S.A. (D)
  – Kouichi Nakamura, Tokyo Gakugei University, Japan (D)
• Reporter: Yo-An Lee (Team Member)
Session Schedule

• Introduction – Explanation of goals & structure of the sessions (10 min)
• Comments addressing Key Questions by the panel (5 min each, total 25 min)
• Discussion (35 min)
• Summary and proposals for action (10 min)
Session 1 (Tuesday, July 10)

Key Questions
A. What are the key elements of Lesson Study that can help teachers gain mathematical knowledge for teaching?
B. What are the key elements of Lesson Study that can help teachers develop expertise in teaching mathematics effectively?

• Chair: Toshiakira Fujii (Co-Chair)
• Discussant: Susie Groves (Team Member)
• Panel:
  – Jennifer Lewis, Wayne State University, U.S.A.
  – Yoshinori Shimizu, University of Tsukuba, Japan
  – Akihiko Takahashi, DePaul University, U.S.A.
  – Tad Watanabe, Kennesaw State University, U.S.A.
  – Nobuki Watanabe, Kyoto University of Education, Japan
• Reporter: Yo-An Lee (Team Member)
COMMENTS ON KEY QUESTION C:

HOW CAN an established effective professional development model such as LESSON STUDY BE TRANSLATED FOR USE IN DIFFERENT CULTURES?

Anika Dreher, Sebastian Kuntze
Potential Obstacles in different cultural settings

- **Systemic Challenges:**
  - Institutional conditions and resources
  - Demands on teachers
  - Unsuitable curricula

- **Teachers’ views**
  - Traditions of professional development
  - Image of the teacher profession, learning disposition

- **Lack of experience and knowledge**
  - Lack of sufficient CK, PCK
  - Lack of experienced lesson study teachers and researchers

- …

(L.C. Hart et al, 2011)
Potential obstacles in different cultural settings

“...lesson study is not an easy jump for those teachers who have never experienced it before.” (Takahashi, 2011)
Key strength of the lesson study method

- Collaborative
- Centered around teachers’ interests
- Focused on students’ learning
A specific example

Aim: Transferring key elements into the context of a university course for pre-service teachers in Ludwigsburg (Germany)

Taking into account:
- specific cultural environment
- Structural conditions of the course
**Goal setting**
Becoming aware of instructional choices regarding representations
Foster students’ competencies in dealing with multiple representations

**Theoretical focus**

- Videotaped classrooms
- Tasks and instructional material

OR

- Reflection
- Planning
- Fictional dialogues/discussions

AND

- Tasks and instructional material
- Reflection
- Planning
- Fictional dialogues/discussions

- Tasks and instructional material
- Reflection
- Planning
References


QUESTION: How can an established effective professional development model such as Lesson Study be translated for use in different cultures?

Some Thoughts About
Adapting Japanese Lesson Study For Other Cultures In Ways Harmonious With Its Reflective Principles

Thomas E. Ricks, Ph.D.
Louisiana State University
tomricks@lsu.edu  www.TOMRICKS.com
ICME2012 DiscussionGroup7
### Process Reflection Framework

<table>
<thead>
<tr>
<th>INCIDENT Reflection</th>
<th>PROCESS Reflection</th>
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<tbody>
<tr>
<td>Limited in time:</td>
<td>Links together reflection incidents:</td>
</tr>
<tr>
<td>Isolated incident / specific episode</td>
<td>Generate progression of ideas</td>
</tr>
<tr>
<td>Only thinking about the past</td>
<td>Using past to inform future action</td>
</tr>
<tr>
<td>Focused thought, structured thinking:</td>
<td>Dewey: Process of Reflection</td>
</tr>
<tr>
<td>Pondering, meditating, reconsidering, remembering, journaling, contemplating</td>
<td>Schön: Reflection-in-action</td>
</tr>
<tr>
<td>Does not test or refine hypotheses through action</td>
<td>Tests and refines hypotheses through action</td>
</tr>
<tr>
<td>Mainly individual activity</td>
<td>Collective reflective activity</td>
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**JLS is a Reflective* Activity**  
*Process (not incident) reflection*
Dewey and Schön

- Both believed reflection was a process of developing and testing hypotheses (most successfully done in collaboration)

Dewey’s Scientific Method of Mind:
- “Testing the hypothesis by overt or imaginative action” (Dewey, 1933, p. 107)

Schön’s Reflection-in-Action:
- (Re)Framing: “Hypothesis to be tested…. a ‘what if’ to be adopted in order to discover its consequences” (p. 149, 93)
- Action: “Experiment [to] test [the success] of the frame” (p. 166)
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Beginning a new reflective cycle

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Cycle continues | Cycle continues | Cycle continues | Cycle continues | Cycle continues |
**QUESTION:** How can an established effective professional development model such as Lesson Study be translated for use in different cultures?

To succeed as a powerful form of PD in other cultures, adapted or modified JLS must maintain the reflective* component

- Chinese Teaching Research Groups (TRGs)
- American Video Study or modified forms of JLS
- Malaysian modified forms of JLS
- Korean forms of lesson study

* Process (not incident) reflection
Thank You

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DG 7 - Question D
How can a professional development model such as a Lesson Study be adapted for use in pre-service teacher education
Professor Berinderjeet Kaur
National Institute of Education, Singapore
Some key elements of Lesson Study

• Study of curriculum.
• Review of related research
• Deliberation on “how best to teach” the lesson
• Voices of other teachers
• Contributions of outside expert
Adaptation of Lesson Study in pre-service teacher education
Infusing key elements of Lesson Study into pre-service teacher education

• Possible areas where infusion is possible:
  - Lesson planning
  - Micro-teaching
  - Teaching practice
THANK YOU
Incorporating “Lesson Analysis” in Secondary Mathematics Student Teaching

Don Gilmore
Metropolitan State University of Denver
12th International Congress of Mathematical Education
July 2012
Conceptual Underpinnings

• Learning, and, in particular, teacher learning, is situated

   Learning to teach as participation in the variety of communities of teaching practice through which teachers move during their school experiences (Lave & Wenger, 1998)

• Influence of Lesson Study
  – Teaching practice that is open and collaborative
  – Focus on the lesson as unit of analysis
Methods Class

• Design, teach and observe, analyze, revise and re-teach two lessons in mathematics for elementary teachers;
• Study lessons captured on videotape;
• Participate as students and observers in lessons taught by the “methods” course instructor;
• Participate—as members of a team that includes the course instructor and their mentor teachers—in planning, teaching and analyzing one lesson in their field experience classroom.
Student Teaching Model

• Daily work as a teaching team
  – When possible, multiple placements and multiple mentor teachers
  – All are teachers who share responsibility for planning and enacting lessons
  – Consistently high quality instruction
• Two “Research Lessons”
Research Lessons

• An augmented team, including cooperating teacher, college supervisor and MTL faculty, students teacher, visiting student teacher from another classroom

• several weeks of preparation, including a formal meeting 1 – 2 weeks before the lesson

• Public enactment of the lesson, taught by the student teacher(s) and observed by the augmented team

• Formal de-brief of the lesson

• Revision and re-teaching of the lesson (if possible)

• Written report by each student teacher
Initial Observations

• Greater involvement of MTL faculty
  – Separates the support and evaluation roles
  – Connects student teaching to rest of program

• Research lessons slow down the whirlwind of practice
  – More detailed discussions of mathematics, teaching and learning
  – The process seems to support student teachers’ learning how to reflect on practice
Some Challenges

• Small pool of strong mentor teachers who use reform-oriented middle- or high-school curricula and are geographically appropriate;

• Aligning the schedules of student teachers and mentors, college supervisors, and MTL faculty who have heavy teaching loads
The development of student teachers’ reality of the mathematics lesson: The germination of culture of lesson study

Koichi NAKAMURA
Tokyo Gakugei University, JAPAN
D. How can a professional development model such as Lesson Study be adapted for use in pre-service teacher education?

- In lesson study, it is important to develop the reality of lesson.
- The lesson is cultural activity and the lesson study is also cultural activity.
The reality of lesson: lesson study

- In the post-lesson discussion, participants mention about events occurred in the classroom, events written in the lesson plan and relation of them as a reality of lesson.

- The event occurred in the lesson is a real.
  - students’ learning process and a teacher’s action
  - a problem posed, the way of posing a problem, and students’ reaction to a problem

- The event in the lesson plan is imagined.
  - a teacher’s action plan, anticipated students’ reaction, the item students have already learned, and so on.
Framework for analysis

- the framework to analyze the reality of lesson that is discussed in the lesson study
- the event
- the meaning of event
- (the background as mathematical and educational (pedagogical) value.)
The post-lesson discussions were conducted right after the lesson. Students could ask their questions and give comments freely.
The reality of lesson for students teachers

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ST (Sakata): Some pupil stood up to see the teacher’s writing on the blackboard. Where is the lowest position that you can write on the board in usual lesson? How do you decide the size of a letter on the blackboard?

ST (Iwata): Some kids who had seats near here, in the individual activity, could not work with the problem. If your teacher finds such kids, how do you do?
Post: Situated, mathematical teaching and learning, naïve imagined

ST (Iwata): Today’s topic is “If we throw five, two of them are goal in.” Nakayama’s (the name of pupil) expression 5:2 seems to me natural.

T: That is right.

ST (Iwata): Another pupil calculated the value of ratio as 5/2 that came from proportion of 5:2.

T: Yes.

ST (Iwata): I observed his notebook, he wrote the meaning of ratio as the number of throwing to get a goal on his notebook. He understood the meaning of proportion 5:2. In the lesson the teacher treated the value of ratio 2/5 in carefully, but I think it is much better to focus on the value of ratio 5/2. How do you think?
DG7_II: Summary and discussion

Professor Dr LIM Chap Sam
School of Educational Studies
Universiti Sains Malaysia
cslim@usm.my
Key questions for today

C. How can an established effective professional development model such as Lesson Study be translated for use in different cultures?

D. How can a professional development model such as Lesson Study be adapted for use in preservice teacher education?
5  Panel members
Addressing Question C:

- **Anika Dreher**, Ludwigsburg University of Education, Germany ©
- **Thomas E. Ricks**, Louisiana State University, U.S.A. (C)

Addressing Question D

- **Berinderjeet Kaur**, Nanyang Technological University, Singapore (D)
- **Don Gilmore**, The Metropolitan State College of Denver, U.S.A. (D)
- **Kouichi Nakamura**, Tokyo Gakugei University, Japan (D)
Key question C

How can an established effective professional development model such as Lesson Study be translated for use in different cultures?
Potential Obstacles in different cultural settings by Anika Dreher

- Systemic Challenges:
  - Institutional conditions and resources
  - Demands on teachers
  - Unsuitable curricula

- Teachers’ views
  - traditions of professional development
  - Image of the teacher profession, learning disposition

- Lack of experience and knowledge
  - Lack of sufficient CK, PCK
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Cycle continues
Implications from Question C

- Lesson Study can be translated to use in different cultures, but
- Japanese LS is part of Japanese culture, it is not possible to adopt a culture;
- It is better to adapt, or integrate into our local culture and
- this will take time and commitment from the teacher participants
How to get teachers (and school administrators) to “buy in” the idea of LS?

How to resolve the issues of “time for discussion and observation” and full commitment of the teacher participants?

An example of resolving the tension in my research project: SK and SJKC
How can a professional development model such as Lesson Study be adapted for use in pre-service teacher education?
Berinderjeet proposed that

Infusing key elements of Lesson Study into pre-service teacher education

- Possible areas where infusion is possible:
  - Lesson planning
  - Micro-teaching
  - Teaching practice
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Implications from Question D

» Lesson Study can be adapted to use in pres-service teachers

Taking into account: (Anika Dreher)
specific cultural environment
Structural conditions of the course

Key elements of LS (Berinderjeet)
» Study of curriculum.
» Review of related research
» Deliberation on “how best to teach” the lesson
» Voices of other teachers
» Contributions of outside expert