APEC Lesson Study Project: Looking Back and Expansion among APEC member economies

APEC HRD Project 03-2006, 02-2007, 02-2008

Collaborative Studies on Innovations for Teaching and Learning Mathematics in Different Cultures (I)(II)(III)

I: Focusing on Best Practices

II: Lesson Study focusing on Mathematical Thinking

III: Lesson Study focusing on Mathematical Communication
Contents

# Target s of APEC lesson Study

# Why do we need Lesson Study?

# Features of Project Framework

# Products of the Project during 2006 -2008

# Examples of the Products

# Expansion of the Project during 2009 - 2010
Target of the Project: Respond to the APEC priority area

Priority area of the third APEC Education Ministerial Meeting in Chile 2004
“Stimulating Learning in Mathematics and Science”

1) Improve the quality of Teaching and Learning Mathematics through Lesson Study

2) Supporting Challenges of Each Economy through Lesson Study

In Chile, Oct. 2007, total 2300 people observed a model of teaching approach at Seven Auditoriums
Why do we need Lesson Study?
We can reform curriculum documents but difficult to implement it.

<table>
<thead>
<tr>
<th>Implementation of Curriculum Standards</th>
<th>Professional Development of In-service Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>No reference</td>
<td>No existence</td>
</tr>
<tr>
<td>7%</td>
<td>0%</td>
</tr>
<tr>
<td>Knowing the existence only</td>
<td>Existence but a few participation</td>
</tr>
<tr>
<td>0%</td>
<td>33%</td>
</tr>
<tr>
<td>Having an opportunity to read</td>
<td>Existence</td>
</tr>
<tr>
<td>7%</td>
<td>20%</td>
</tr>
<tr>
<td>Trying to implement</td>
<td>Existence and Working</td>
</tr>
<tr>
<td>86%</td>
<td>40%</td>
</tr>
<tr>
<td>Well implementing</td>
<td>Well working</td>
</tr>
<tr>
<td>0%</td>
<td>7%</td>
</tr>
</tbody>
</table>

86% of economies have been engaging in movement of Lesson Study for improvement.
The Project is:

Useful for Improvement of the Quality of Education 100%.
Influential to Other Subjects Such As Science 93%.

Through Lesson Study, Specialists, including new comers, are working;

- for Developing Innovative Teaching Approach → 93%
- as a Part of Curriculum Implementation → 80%
- for Curriculum Improvement → 80%
- for Sharing Model of Teaching Approaches → 80%
- for Developing Teachers → 80%
- for Developing Students → 80%
APEC Project Framework: APEC Fund and Self Fund

APEC grant ($90,000), Thailand ($50,000), Japan ($90,000), USA ($15,000),
and other expenses by each economy

Project Meeting
For Planning (Japan)
For Producing (Thailand)

Products:
Textbook
Videos
Knowledge Bank
Wiki

from
Chalk and Talk Approach
to
Learner Centered Approach

Each Economy

Specialists

Group of Teachers

Group of Teachers

Group of Teachers

Approach to Learner Centered Approach
Products for APEC Lesson Study Project during 2006 -2008

- Reports (proceedings, book, website, and videos) (approx. 20 videos)

- Developing model of teaching approaches

- Sharing model of teaching approaches on Knowledge Bank

- Developing Lesson Study community using website, such as Knowledge Bank and Wiki, and live broadcast via internet
Classroom Innovations through Lesson Study is an APEC EDNET Project, under the priority area of Mathematics. This project is sponsored by APEC Members Japan and Thailand. The official website for this project can be found by clicking here. The APEC-Tsukuba International Conference III was be broadcasted live from Tokyo, December 9–10, 2007.

This project focuses on Lesson Study with the goal of improving the quality of education in Mathematics and has developed a collaborative network of Lesson Study experts among member economies. Key products include Lesson Plans and Videos from APEC members including many of the highest scoring educational systems on TIMSS international assessments. Masami ISODA & Shizumi SHIMIZU (University of Tsukuba, Japan) and Maitree INFRASITHA & Suladda LOIPHA (Kohn Kaen University, Thailand) are Project Overseers. Akihiko TAKAHASHI of DePaul University directs the Lesson Study Wiki Pilot Project Taskforce.

1. Process and products
2. Importance of lesson study
3. Learning from lesson study
   a. Research Lesson Video
   b. Lesson study resources
   c. Ideas from lesson study
4. Lesson study worldwide
5. Mathematics teaching and learning worldwide
6. Glossary of lesson study terms
7. Lesson study calendar worldwide

Process and products
Lesson Study began in Japan in the 19th century to allow Japanese teachers who mainly used individualized instruction to learn group instruction from Western countries. The Lesson Study Approach follows a continuous improvement process in teaching a topic (not limited to mathematics) that generally comprises the following steps: 1) Defining a teaching problem based upon students’ needs, 2) Lesson Study Planning with the student and the teacher as the central focus, 3) Teaching the lesson with a focus on student thinking/learning/misunderstanding, 4) Evaluating the lesson’s impact on student learning and reflecting on its effect, 5) Revising the lesson based upon the data collected, 6) Teaching the revised lesson to a new class of students, 7) Evaluating and reflecting, and 8) Sharing the results.
Video ヘリンク

Multiplication Algorithm Grade 3 - Teacher Hideyuki Muramoto

The lesson was taught by Hideyuki Muramoto with support of Kezuyoshi Okubo. The CRICED, University of Tokuba, has the copyright of the Lesson Plan and the Full Lesson video. The Full Lesson Video was directed by Masami Isoda and the List of Episodes and clips were developed by David Tall.

You may download the above files for your own use (information).

This 50-minute research lesson was presented at Sapporo City Maruyama Elementary School to a class of 40 third grade students. It is the fourth of a sequence of 13 lessons. The preceding lesson considered the product 20 times 3 and the children were encouraged to calculate the number of black circles in the array below. In the figure the total is (10 times 3) plus (10 times 3), which is 30+30, giving 60.

The current lesson is planned in detail in the Lesson Plan (above) and sets out to encourage children to use their previous knowledge to solve a problem to calculate how many circles in a new array (which they will find is 23 times 3). The plan is to find different methods for doing this, to consider which are complicated and which are easier and, if any child suggests column multiplication, to link this to the practical activities. The longer-term goal is to make the children aware of the advantages of column multiplication building from meaningful experience related to practical examples.

Note how the teacher starts at the left-hand side of the board with the problem, writes up the development of the lesson, circling important points in yellow, so that the whole lesson structure is seen on the board at the end of the lesson.

The clips below

- are selected from the full List of Episodes (above). The Full Lesson Video may be downloaded for further study.

The problem (video 1 of 7):
start 01 55, length 1:20
- Watch the video (streaming version)
- Download the video (downloadable version, MPEG4)

Amon sees 23 as 20+3 (video 2 of 7):
start 16 45, length 2:18
- Watch the video (streaming version)
- Download the video (downloadable version, MPEG4)

Amon 'not finished' (video 3 of 7):
start 21 56, length 1:10
- Watch the video (streaming version)
- Download the video (downloadable version, MPEG4)

Using 10-yen coins (video 4 of 7):
Live: APEC-Tsukuba International Conference III
Innovation of Classroom Teaching and Learning through Lesson Study

Conference Organizations;
Organized by: University of Tsukuba, Co-organized by: Ministry of Education, Culture, Sports, Science and Technology (MEXT, Japan), Kanazawa University, Khon Kaen University (Thailand). Supported by Japan International Cooperation Agency (JICA), Japan Society of Mathematical Education, Japan Society of Science Education.

APEC HRDWG Project;
Collaborative Studies on Innovations for Teaching and Learning Mathematics in Different Cultures (III) - Lesson Study focusing on Mathematical Communication -

Project Overseers;
Masami Isoda, Shizumi Shimizu, Maitree Inprasitha, Suladda Loipha

Project Websites;
http://www.criced.tsukuba.ac.jp/math/apec/
http://apec.pwiki.com/Classroom-Innovations-through-Lesson-Study
http://math-info.criced.tsukuba.ac.jp/
http://home.kku.ac.th/crne/

Project References;
http://www.apecknowledgebank.org/
http://www.worldscibooks.com/mathematics/textbook/6639/6639_chap01.pdf

Live streaming on Dec 9 and 10(JST) 2007

Japan Standard Time 2008年1月11日 7:20:22
Local time 2008年1月11日 7:20:22
UTC 2008年1月10日 22:20:22

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### Live Lesson Demonstrations on Dec. 9 and 10, 2007

**Number of the Access of the Internet TV program**

<table>
<thead>
<tr>
<th>Region</th>
<th>APEC</th>
<th>Outside</th>
<th>Economies (Number of access in case larger than 20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>233</td>
<td>2</td>
<td>USA(150), Canada(83), Mexico, Honduras, Guatemala</td>
</tr>
<tr>
<td>South America</td>
<td>97</td>
<td>16</td>
<td>Chile(54), Peru(43), Brazil, Argentina</td>
</tr>
<tr>
<td>Asia (except Japan)</td>
<td>199</td>
<td>41</td>
<td>Thailand(87), Malaysia(37), Singapore(25), Brunei Darussalam, Hong Kong, Philippines, India, Chinese Taipei, Korea, Indonesia, China, Macau, Israel, Jordan, Turkey</td>
</tr>
<tr>
<td>Japan</td>
<td>677</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Oceania</td>
<td>24</td>
<td>0</td>
<td>Australia(22), New Zealand</td>
</tr>
<tr>
<td>Europe</td>
<td>0</td>
<td>74</td>
<td>Sweden(46), UK, France, Denmark, Bosnia Herzegovina, Norway, Netherland, Bulgaria, Poland, Italy, Germany</td>
</tr>
<tr>
<td>Africa</td>
<td>0</td>
<td>5</td>
<td>Uganda, South Africa, Morocco</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1130</strong></td>
<td><strong>138</strong></td>
<td>40 economies/countries in the world, 19 economies from APEC (Number of the access from APEC except Japan)</td>
</tr>
</tbody>
</table>
Expansion of Lesson Study during 2009 - 2010

- To expand to other subjects such as Science and others (e.g., Mathematical science)
- To encourage successful economy to host Lesson Study workshop for more expansion
- To share experiences among APEC member economies by using effective means of communication supplementary to books or proceedings

Videos on website (e.g., Wiki project), Live broadcasting via internet