

A Progress Report of the APEC Project:
“A Collaborative Study on Innovations for Teaching
and Learning Mathematics in Different Cultures
among the APEC Member Economies”



APEC - KHON KAEN International Symposium



*“Innovation and Good Practices for Teaching
and Learning Mathematics through Lesson Study”*



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**PROMOTING LESSON STUDY AS ONE
OF THE WAYS FOR MATHEMATICS TEACHERS PROFESSIONAL
DEVELOPMENT IN INDONESIA: THE REFLECTION ON JAPANESE GOOD
PRACTICE OF MATHEMATICS TEACHING THROUGH VTR**

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Reflecting good teaching practice of mathematics from different context through VTR was proved to evidently encourage and motivate teachers to improve their teaching competencies. In some parts of the activities of teachers professional development programs in Indonesia, year 2002-200, the reflections through VTR of Japanese context of teaching practice (Teacher: SAITO, Kazuya; School: Okayama Elementary School, Yokohama city, Unit: The area of plane figures) resulting teachers' perception that it was a good model of mathematics teaching that can possibly be implemented in Indonesia. However, the teachers were aware that to implement such good model there are some fundamental constraints should be overcome.

Overview

VTR (Video Tape Recorder) for teacher education and reform movement in Mathematics Education, specifically for developing lesson study has some benefits as: a) short summary of the lesson with emphasis on major problems in the lesson, b) components of the lesson and main events in the class, and, c) possible issues for discussion and reflection with teachers observing the lesson (Isoda, M., 2006). According to him, a Lesson Study is divided into three parts: a) planning the lesson, b) the observation part, and, c) the discussion and reflection part.

Further he stated that when we use the VTR, we also begin from the lesson observation but the VTR itself already loses many dimensions, parameters and context because the program is prepared (recorded) from the perspective of the recorder's and VTR editor's eyes only. Through the observation of the VTR, we learn things and apply these in the next activity. Teachers in Indonesia can observe the lesson of different context in different country (e.g. Japan) through VTR.

If we observe teaching learning processes through VTR, a short summary is necessary to grasp the contents and we need to observe the VTR several times to understand its contents clearly. Having done this, it may arise the usefull issues for discussion and

reflection as well as to reflect on good practices, good lessons or innovative lessons for the reform of mathematics education.

In the process of pre-service teacher education, it is important to develop teacher's perspectives. Learning to listen is a key word for this approach. In the case of Japan, lesson study usually begins by developing a lesson plan. At this stage, teachers solve and pose problems from students' perspectives. By analyzing problems, teachers develop good ways of questioning. For writing the description of the VTR, it is very important to ask why? Why did students say this? Behind their words, there must be so many kinds of ideas. Why did the teacher say that? Through these questions, we can better know and understand the hidden features of the lessons being observed through VTR. Then, it is very important to add the format such kinds of descriptions from the view points of original lessons but even if we add descriptions we do not need to follow because re-contextualization is done by VTR users. (Isoda, M., 2006)

Teachers Professional Development

Since the early of 2000, there are cooperations among universities, teacher training institutes and MoNE's Directorate of Secondary Education to improve teachers' competencies to support the implementation of the proposed competent-based curriculum (Curriculum 2004). The author has involved in some professional development activities (workshops) surrounding Indonesia such as:

1. Validation and Socialization of the Guideline of Syllabi and Evaluation System of Competent-Based Curriculum for Mathematics in Manado, North Sulawesi. 16-17 September 2002 (40 participants from Local District)
2. National Semiloka for Socialization the Development of Competent Based Curriculum for Junior High School Mathematics in Yogyakarta, 20-25 and 27-31 October 2002 (120 participants consists of four representatives from each District)
3. Validation and Socialization of the Guideline of Syllabi and Evaluation System of Competent-Based Curriculum for Mathematics, Yogyakarta, 22 November 2002 (60 participants consists of 2 representatives from each District)
4. National Level of Training of Trainer (TOT) for Basic Science, in Yogyakarta, 4-14 June 2003 (60 participants consists of 2 representatives from each District)
5. National Level of Training of Trainer (TOT) for Basic Science, in Yogyakarta, 15-20 December 2003 (60 participants consists of 2 representatives from each District)
6. Monitoring and Evaluation of the Piloting of Competent-Based Curriculum for Mathematics in State Junior High School I and III, Binjai, North Sumatra. Desember 2004 (20 participants from 2 schools)
7. Monitoring and Evaluation of the Piloting of Competent-Based Curriculum for Mathematics in Padang, West Sumatra, January 2005 (80 participants from Local District)

Lesson : Choosing Tasks according to Pupils' Interests (4th grade)
 Teacher : SAITO, Kazuya
 School : Okayama Elementary School, Yokohama city
 Unit : The area of plane figures
 Method : Tasks based on pupils' interests.

The objectives:

- Pupils appreciate the formulas for the area of figures and are willing to use the formulas in order to find the area.
- Pupils are able to find the area making the best use of their prior knowledge and experience.
- Pupils are also able to formulate the methods to find the area of parallelograms.
- Pupils can find the area of fundamental Figures efficiently.
- Pupils understand the methods to find the area of fundamental figures.

Highlighting the VTR:



Teacher posed the problems as follows:

Can you find the area of the figure?
 If you think about how this figure is made?



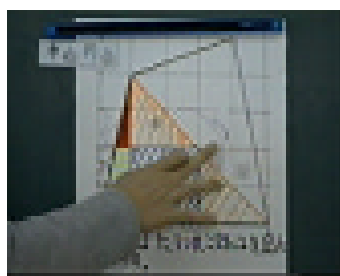
Pupils begin by reflecting on their prior knowledge, experience, and the opportunity to learn about area in the previous grade.

Pupils make a plan how to decompose the figure in the problem into square, rectangle, right-angled triangles, parallelogram, or trapezoid, in order to find the area of the figure.



Pupils realize that they have to begin by learning how to find the area of triangles. Pupils discuss how to decompose the figure. Then, they do the problem separately in three groups as follows:

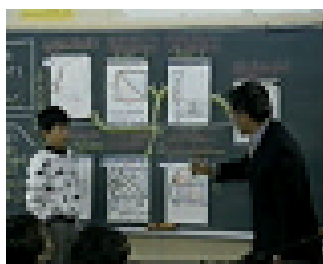
- The figure in the problem can be decomposed into right-angled triangles and rectangle.
- The figure in the problem can be decomposed into a few triangles.
- The figure in the problem can be decomposed into triangles and parallelogram or trapezoid.



Pupils formulate the methods to find the area of scalene triangles

Pupils try to find the area of quadrilaterals using the formula for the area of triangles.

Pupils shall find the area of quadrilaterals using



Pupils use parallelogram to find the two congruent triangles area of rectangles, and by a diagonal line, pupils shall solve the problem.

The following are their perceptions:

Teacher perceptions of the teaching in the VTR:

1. 100 % of the total numbers of participants perceived that the teaching reflected in the VTR was a good model of teaching mathematics.
2. 80 % of the total numbers of participants perceived that the teaching in the VTR is a good model and it needs to be socialized to other teachers.
3. 73,3 % of the total numbers of participants perceived that they are willing to discussed it to their colleagues after the training.
4. 96 % of the total numbers of participants perceived that the teaching in the VTR is a good model but there are still some constraints to implement it.
5. 53,3 % of the total numbers of participants perceived that the constraint to implement this good model of teaching is that the teachers' lack of time.
6. 33,3 % of the total numbers of participants perceived that the constraint to implement this good model of teaching is the unreadiness of the students
7. 26,67 % of the total numbers of participants perceived that the constraint to implement this good model of teaching is the limit of budget
8. 47 % of the total numbers of participants perceived that the constraint to implement this good model of teaching is lack of educational facilities.
9. 25,6 % of the total numbers of participants perceived that they were optimistically able to implement this good model of teaching by additional time of teaching and developing lesson preparation.
10. 42 % of the total numbers of participants perceived that to implement this good model of teaching, they need to improve their competencies of teaching contents.

Teachers' perceptions of the actions following up the training:

1. 80 % of the total numbers of participants perceived that they will discuss the VTR with their colleagues
2. 60 % of the total numbers of participants perceived that they will disseminate the results to other teachers
3. 40 % of the total numbers of participants perceived that they will discuss the VTR in the teachers club
4. 55 % of the total numbers of participants perceived that they will try to improve their teaching covers: improving Lesson Preparation, Student Work Sheet, teaching content and teaching methodology.

Teachers' perception of the kind of teaching method they will develop after the training:

1. 6,7 % of the total numbers of participants perceived that they will develop Realistic Mathematics Education and Constructivis approach.
2. 38 % of the total numbers of participants perceived that they will develop discussion and demonstration methods.
3. 17 % of the total numbers of participants perceived that they will develop various methods.
4. 33,3 % of the total numbers of participants did not indicate any method.

Concluding Remark

In general, the activities of reflecting Japanese context of mathematics teaching through VTR in the training program were perceived as good and useful by the teachers. The teachers perceived that such activities need to be socialized to other districts in order that more teachers can learn it. They perceived that the teaching reflected in the VTR was a good model that can also be implemented in Indonesian context. However, they perceived that it is not easy to implement it.

The teachers viewed that to implement good model of mathematics teaching, as it reflected in the VTR, there are some constraints coming from: lesson plans, students' worksheets, teachers' competencies, students' readiness, educational facilities and equipments, teaching methodologies, allocation of time, number of students and budgeting. Teachers need to improve their competencies of teaching and competencies of teaching contents. They perceived that they need to improve their competencies in preparing the lesson plans and producing students' worksheets.

According to teachers, most of the students are not ready or not able to present their ideas; it takes time for them to accustomed to do that. Most of the schools are lack of educational facilities and teachers need to be able to develop teaching media. The most difficult one to implement such good model of teaching practice is about time allocation. Some teachers perceived that it is not easy to take in balance between achieving students' competencies and considering their processes of learning. Meanwhile, a teacher still should facilitate a lot number of student i.e forty students per class.

The teachers hoped that the schools and government support their professional development including the chance to get training, to participate the conferences, to participate in teachers club. The teachers perceived that in the teachers' club they are able to discuss and develop lesson plan and students worksheet. Teachers suggested that teachers' professional development programs should be based on teachers' need; and

therefore, it needs such a need assessment prior the programs. They also hoped that the schools and government procure educational facilities and improve their salary.

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