

Adapting Lesson Study in APEC Member Economies

Maitree Inprasitha, Khon Kaen University

February 2010

Introduction

After the 1999 Educational Act has been launched, the first decade of educational reform movement (1999-2009) during the information age started in Thailand. In order to be aligned with the national agenda – “to reform learning process”- inaugurated in the act, new curriculum called “2544 B.E. Basic Education Curriculum” has been implemented in schools nationwide. Policy makers, curriculum developers, other related educational personnel, and teachers themselves seemed to notice the distinguished features of this new curriculum which emphasizes not only contents or subject matters but also learning processes, and desirable characters. During the first half of the first decade of educational reform, we witnessed many attempts to respond to the new curriculum demands, observing a huge number of innovative programs and projects implemented in schools with the support of the Ministry of Education, other governmental and non-governmental organizations, and even projects initiated by schools themselves.

In order to encourage and support teachers to contribute to the success of those attempts, the government has made every effort to contributing to this big educational reform. In particular, there is a new promotion system for teacher professional development which is correspondent to the promotion system in the university, that is, the teachers can be promoted to get both basic salary and position salary if their academic work has been approved by the ad hoc committee. This promotion system stimulated the teachers in every school to conduct their academic work, not only teaching work as they used to be done before, for example, doing some kinds of classroom research, documenting it and submitted to the ad hoc committee for approval. Unfortunately, this observed phenomenon can be called ‘successful’ in terms of promoting ‘only’ the teachers but not ‘the students’. A number of newspaper headlines read *‘has not much change in the classroom’*, *‘still need innovation for real change in the classroom’* etc. It seems that classroom has not been changed. We have been struggling for ‘Best practices’ on how to change the classroom which really promote ‘teachers’ as well as students’ learning reform in the classroom.’ According to this background, many Thai educationalists are very concerned that maybe Thailand must begin a new journey and embark upon a second decade of educational reform (2010-2019).

Adapting Lesson Study in Thailand

The history of how Japanese Lesson Study has been adapted into school culture in Thailand started a decade ago. In the year 2002, Inprasitha (Inprasitha, 2008) implemented lesson study with 15 student teachers voluntarily in teaching mathematics in 7 secondary schools in Khon Kaen districts and nearby. In this first attempt, three phases of lesson study were implemented. The process of lesson study was adapted in the following manner.

In the planning phase, Inprasitha (2008) as a researcher, coached 15 students to spend a lot of time to carefully create lesson plans by emphasizing mathematical activities using open-ended problems. Half of the lesson plans to be used in the first semester were completed before they went to schools. Usually, student teachers create their lesson plans when they go to schools and only a week before they teach. In the implementation phase, the student teachers taught the lessons in the usual classrooms, observed at times by their friends teaching at the same school and who had to observe the classes in their spare time. They had to keep a diary or journal to record the problems of using mathematical activity with open-ended problems and the students' responses to the mathematical activity (e.g., how the students interpret the instruction of the activity, the vagueness of the instruction, expected and unexpected students' responses to the mathematical activity). In the post-discussion phase, since we could not conduct the discussions immediately after teaching classes, all student teachers came back to the Faculty of Education and spent at least 3 hours every Friday completing post-discussion with the coach.

Inprasitha (cf., Isoda et al., 2007) summarized the result of this project as follow:

During the first half of the semester all student teachers in the project experienced some difficulty adjusting to their new teaching roles and classroom organization. Participation in the weekly seminar facilitated the student teachers gradual change of the teachers' role. The most critical point of change was encountered while sharing their differing teaching experiences among friends and colleagues. Sharing experiences with their friends during the weekly seminar not only resolved their common concerns but also developed and expanded their own pedagogy, teaching practices and professional development. The greatest paradigm shift for student teachers was that teaching mathematics does not mean focusing on the coverage of content but emphasizing the students' learning processes, original ideas, attitudes towards learning mathematics and satisfying one's own competence. To scrutinize what adaptation we made in this project, two issues are 1) the integration of lesson study and Open Approach and 2) the outside person's roles in stimulating change in schools with profound understanding of how to improve sustainable professional development.

With the impression of success of this small project, the researcher attempted to expand implementing lesson study with in-service teachers and with more number of schools. Unfortunately, in the expansion of lesson study in 2004-2005, more focus was on using Open Approach and less emphasis on the process of lesson study. Although most of the teachers successfully used open-ended problems to change their classrooms and their roles in classroom organization and most of the students, especially those who rarely engage in mathematical activity, had more chance to actively access to mathematical activity, the great demand on open-ended problems is obvious. The teachers developed a sense that it is not the teachers who should create their own open-ended problems due to the limitation of time they have in schools. As a result, they request other organizations such as the center for research in mathematics education to provide open-ended problems so that they can smoothly handle the situation. This kind of attitude made the teachers reluctant to continue using Open-Approach. The researcher takes this risk by introducing the long-term project of how to implement lesson study in schools by incorporating Open Approach into Lesson Study process.

The three-year long project (2006-2008) implementing the integration of lesson study and Open Approach in 4 project schools started in the year 2006. More systematic adaption was conducted this time. The project was designed to have lesson study team including one university professor

as a coach, at least two graduate students from master degree program in mathematics in each school, one school coordinator (new position working in this project) working four days at school and come back to the university for doing reflective seminar about the implementation of lesson study. School teachers, principals and supervisors also voluntarily joined this project in two of four schools. Lesson study in mathematics was conducted in 1st and 4th grades in 2006, 1st, 2nd and 4th, 5th grades in 2007, 1st, 2nd, 3rd and 4th, 5th, 6th grades in 2008. The project completed implementing lesson study in mathematics as a model for implementing lesson study mathematics in 9 years of compulsory education in elementary and expansion schools. These experiences have been sharing within the country and in APEC member economies through the project will be discussed in the next session.

Adapting Lesson Study in APEC Member Economies

1) Cycle of Implementing Lesson Study Member Economies

Among many attempts in responding to the national agenda and curriculum demand mentioned in the earlier session, there has been a modest initiative project to implement innovative teaching approaches to improve teaching mathematics and in turn improve professional development of mathematics teachers. *“A Collaborative Study in Innovative Teaching and Learning Mathematics among Different Cultures in APEC member Economies”* was proposed by Thailand and Japan to APEC HRDWG annual meeting in Pattaya, Thailand in 2005. An idea of how to implement lesson study in APEC member economies is as follows. The project overseers identified ‘specialists’ who have background in attempting to improve teaching mathematics and professional development in each economy. The project overseers intended that each specialist from a participating economy would have played a major role in implementing, expanding, creating lesson study network in his/her economy while sharing experiences with other specialists by participating in this project. A one year cycle of implementing lesson study in member economies is composed of 4 phases as below.

HRD 03/2006: A Collaborative Study on Innovations for Teaching and Learning Mathematics in Different Cultures among the APEC Member Economies

Phase I: An open symposium and a closed workshop for key mathematics educators from the APEC members economies on “Innovative Teaching Mathematics through Lesson Study” were held on January 15 – 20, 2006 in Tokyo by CRICED. The aim was to further refine a research proposal and a collaborative framework for the development of innovations and good practices for teaching and learning mathematics. At this gathering “Lesson Study” was selected as the key innovation.

Phase II: Based on the agreed collaborative framework, each of the cosponsoring APEC economies conducted a research during February and March 2006 in an actual classroom setting in their home economies to develop innovations and good practices in teaching and learning mathematics through Lesson Study.

Phase III: An APEC International Symposium on “Innovation and Good Practices for Teaching and Learning Mathematics through Lesson Study” was organized in Tokyo for the purpose of sharing and reflecting on research results and good practices as discovered by research teams of

the economies. The Symposium was hosted by the CRME of Khon Kaen University, Thailand during June 14-27, 2006.

Phase IV: An APEC Workshop on “Improving the quality of the mathematics lesson through Lesson Study” was held in Thailand on August 24 – 27, 2006. Here, the Japanese teaching method was introduced to Thai teachers in the manner of a workshop on Lesson Study.

HRD 02/2007: Collaborative Studies on Innovations for Teaching and Learning Mathematics in Different Cultures (II) – Lesson Study focusing on Mathematical Thinking –

Phase I, Activities in the first phase are as follows: Lectures and a panel for sharing ideas of mathematical thinking to help develop lessons by teachers; and a Workshop to develop a collaborative framework for using Lesson Study to develop mathematical thinking. Specialists observed four research lessons in Japanese classrooms and shared the ideas of Lesson study to develop mathematical thinking. A forum where specialists shared their ideas on mathematical thinking based on the keynote lectures and their experiences, was held on December 2 – 7, 2006 in Tokyo & Sapporo, Japan.

Phase II, Each co-sponsoring APEC member economy engaged in the Lesson Study project for developing some topics on communication (February-July 2008).

Phase III, An International Symposium and a Lesson Study meeting (a kind of workshop for teachers) was organized in order to share teaching approaches for developing communication by economies. The symposium was hosted by Center for Research in Mathematics Education (CRME), Faculty of Education, Khon Kaen University, Thailand (at Khon Kaen, August 16 – 20, 2007).

Phase IV, A workshop in Khon Kaen, Thailand (August 15 – 16, 2007)

HRD 02/2008: Collaborative Studies on Innovations for Teaching and Learning Mathematics in Different Cultures (III) – Lesson Study focusing on Mathematical Communication.

Phase I, A workshop and a lesson study meeting which is designed for specialists among key mathematics educators from APEC member economies hosted by Center for Research on International Cooperation in Educational Development (CRICED), University of Tsukuba, Japan was organized in order to share the ideas and ways of communication on curriculum level and teaching level (at Tokyo & Kanazawa, December 2007).

Phase II, Each co-sponsoring APEC member economy engaged in the Lesson Study project for developing some topics on communication (February-July 2008).

Phase III, An International Symposium and a Lesson Study meeting (a kind of workshop for teachers) was organized in order to share teaching approaches for developing communication by economies. The symposium was hosted by Center for Research in Mathematics Education (CRME), Faculty of Education, Khon Kaen University, Thailand (at Khon Kaen, August 24 – 28, 2008).

Phase IV-1, Lesson Study as a theme in 11th ICME in Monterrey, Mexico, July 6 – 13, 2008

Phase IV-2, First Open Class of Lesson Study in Australia in International Conference in Sydney in March 16 – 18, 2009)

Summary of the Results of 3 Years Project (2006-2008)

Based on the procedure mentioned above, the results obtained during the four phases are presented below.

Developing innovations by focusing on good practices

1) Clarifying the meaning of good practices

At the beginning of this project, specialists/project overseers tentatively proposed the meanings of good practices in mathematics education with the following conditions:

- 1) Good practices must be visible and can be recorded in the classroom and demonstrated to other people.
- 2) The practices must be accepted as a good practice in each member economy.
- 3) There must be at least one teacher who is well known for that approach.
- 4) The practices must be useful for mathematics education reform in each member economy.
- 5) The practices must cause other teachers to wish to apply the same approach to their teaching.
- 6) The practices must be known as being useful for teacher education (pre-service and in-service alike).
- 7) Comparatively, there are different/traditional approaches based on different/traditional values.

To collaboratively develop innovations in teaching and learning mathematics, the project focused on gathering good practices using video recording from specialists in each economy and discussed “what is good,” “why is it,” and “how can the teachers develop such a good practice.” Watching the specialists elaborate on these themes through the videos, we were able to observe how each of these ‘good practices’ had been developed in different cultural settings. Based on these differences we could further re-evaluate our own ‘good practices’ from a new/different perspectives. We also found new ideas and teaching methods which can be applied to mathematics classrooms in APEC member economies.

2) Deciding to use Lesson Study as a means of developing good practices

As in phase I, specialists attended the conference with many lectures given by keynote speakers on Lesson Study. They then observed four lesson study classes at the attached schools to the University of Tsukuba in Tokyo. They also presented a variety of ideas on good practices through their papers or complementary videos. Japanese Lesson Study originated in Japanese culture. While specialists in some economies experienced its adaption in their local school contexts, specialists in other economies may not be aware of it. The participants elaborated and shared the significance and meanings of Lesson Study obtained from those experiences and to participate in the Lesson Study organized at the attached schools. Eventually, all the participants reached a consensus on the application of Lesson Study as a means to develop good practices in the economies. The responses to the questionnaires distributed at the meeting in this regard were very positive.

The process of developing and sharing good practices

In Phase II, based on the shared idea on using Lesson Study as a collaborative framework, each of the specialists developed his/her innovations by emphasizing good practices in teaching mathematics.

Also in Phase II, specialists from each participating economy produced videos on good practices during the conduct of their research activities to share with their colleagues at the International Symposium in phase III.

In Phase III, recognizing different cultures as an attribution to innovative idea, specialists found various challenges (e.g., the adaptation of Lesson Study) to develop good practices in teaching mathematics. The specialists also learned from each other about how to meet these challenges.

In Phase IV, some specialists produced videos on good practices from the workshop in Thailand and gathered some videos on good practices from other Lesson Study project such as the one in Chile.

Implementing Lesson Study in member economies

1) Experimenting Lesson Study

In Phase II, specialists began to use Lesson Study in each economy to exemplify the meaning of good practices. Specialists from thirteen economies engaged in the Lesson Study activities and subsequently nine videos on good practices were produced.

2) Sharing the results of Lesson Study through the prepared videos

In Phase III, specialists observed the local mathematics classes and observed classes conducted by a Japanese teacher. In this phase, they also reported on the findings of each research project conducted in Phase II. They then shared the methods they had observed in an attempt to describe good practices through video recording. The responses from the audiences to the questionnaires distributed at the meeting regarding research findings were very positive.

3) Producing videos on Lesson Study for teacher education

In Phases III and IV, specialists tried to expand Lesson Study for the benefits of in-service teachers by organizing a Lesson Study workshop for local school teachers in their respective economies such as Chile and Thailand. At these activities, six Lesson Study videos were produced to be used as a model of good practices.

Summary on Implementing Lesson Study in APEC Member Economies

In 2006, lesson study has been introduced in 12 APEC member economies as an innovative method for teaching and learning mathematics. With different school cultures, each economy has learned a lot of the problems when we acculturate lesson study as a cultural activity in school. In 2007, as lesson study became a part of school culture, the project focused on how to develop student's mathematical thinking in classroom. In 2008, after the specialists met in Tokyo and Kanazawa and observed how Japanese teachers develop their student's mathematical communication, they challenged schools in their economies.

As we have done in the last two years, by using videos, we, specialists of the project, shared our ideas on "good practices" in Khon Kaen, Thailand in August 2008. We also collaboratively reflected upon what we have done in the collaborative framework. We decided to keep and

continue using this collaborative framework and to focus more deeply on the specific themes we think are necessary for school mathematics in each economy.

Besides, this project encourages each participating economy to expand this collaborative framework – Lesson Study – in each economy, in order for Lesson Study to be gradually integrated in school cultures of that economy. For example, as a case of success, in Thailand in 2009 the Ministry of Education set an educational policy to expand lesson study in 12 provinces and will expand more in the next three years countrywide. At the same time, Australia first started a public open class in the Sydney Conference March 2009.

As 2008 passed, the project concretely produced “good practices” such as classroom videos, progress reports, proceedings. These appeared both in hard copy and on the website of related organizations (e.g., those of CRICED (www.criced.tsukuba.ac.jp/math/apec2006), CRME (www.crme.kku.ac.th), and HRDWG Knowledge Bank wiki (http://hrd.apecwiki.org/index.php/Classroom_Innovations_through_Lesson_Study)).

More importantly, the project created networks among mathematics educators and teachers, inside and outside of APEC member economies.

In the year 2009, under the economic crisis, the project overseers decided to extend the project by organizing 2009 Sydney Conference and this event included the first open class in Australia. After APEC Lesson Study strengthened collaboration among specialists and began to facilitate teachers networking at the national and international levels, the 4th APEC Lesson Study has shifted its attention from focusing on mathematical learning process to more cross-cutting themes like ‘assessment’ and also extended their interest to engage in the discipline of science. The new three-year proposal focusing on teacher education was submitted at the APEC HRDWG conference in Hiroshima during Feb 25-28, 2010.

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