

Transforming Education Through Lesson Study: Thailand's Decade-Long Journey

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Abstract The development of teaching and the teaching profession is an issue countries around the world have been struggling to solve for many centuries. Lesson study, a Japanese way of professional development of teachers, dates back nearly 140 years, in 1872 the Meiji government invited foreign teachers to teach Japanese teachers about “whole class instruction” (Isoda 2007). Ironically, in 1999, Stigler and Hiebert brought back to the U.S. the same idea on how to present whole class instruction, “If you want to improve education, get teachers together to study the processes of teaching and learning in classrooms, and then devise ways to improve them” [Stigler 2004 cited in Fernandez and Yoshida 2004]. Although the education reform movement around the world calls for effective reform tools or even ideas like Japanese lesson study, transferring those tools/ideas to other socio-cultural setting in other countries is not easy and always complicated. Thus, education reform movements sometimes support but sometimes hinder movement of society. Taking Japan as a case study, Japan has undergone the movement of society from agricultural to industrialized, to information, and knowledge-based society during the two centuries since the late 18th century to the present. Not visible to outside people, an evolution in the approach to school has taken place in Japan, which supports the movement of society, which has not occurred in most developing countries, including Thailand. Thailand has looked to Japan for ideas and has been implementing lesson study since 2000 but with a unique approach to adaptation. Thailand's experience with lesson study has been shared with APEC member economies over the last six years and has been deemed “quite a success” in improvement of teaching and learning of mathematics.

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Introduction

Education reform around the world has moved in the same direction but has begun at different times. It sometimes has supported but other times hindered the movement of society. Japanese society has transitioned from agricultural to industrialized to information, and now a knowledge-based society over the two centuries between the late 18th century and the present. Not visible to outside people, an evolution of school approach has occurred, which supports the movement of society; such a change has not taken place in most developing countries, including Thailand (Fig. 1).

Traditionally, most mathematics classrooms in Thailand depend heavily on following the national textbooks. The textbook format consists of with introducing some definitions, principles, rules, or formula followed by some examples, and ends with some assigned exercises. Unfortunately, most exercises are closed problems, which have one and only one correct answer. These textbooks have influenced teachers’ teaching style. Mathematics teachers’ teaching script begins with explaining new content, provides some examples, and ends with assigning students some exercises. This method of teaching is prevalent in the classrooms, where students cannot initiate their own learning and become passive learners. Such school approach in Thailand does not support the movement of Thai society, as compared with Japan. Over four decades from 1960 to 2000, Thailand had only two major educational reform movements, in 1975 and 1999. The first Educational Act was enacted in 1999 “To reform the learning process” as a national agenda. In response, the Ministry of Education implemented a new core standard curriculum, which demands that school teachers integrate subject matter, learning process and skills, and desirable characters when implementing the curriculum. However, it is not easy for them to comply the Educational Act, and the traditional approach to teaching persists among non-affluent countries. During the last decade, Thailand has been introducing the idea of lesson study into Thai schools and sharing its progress with other APEC member economies.

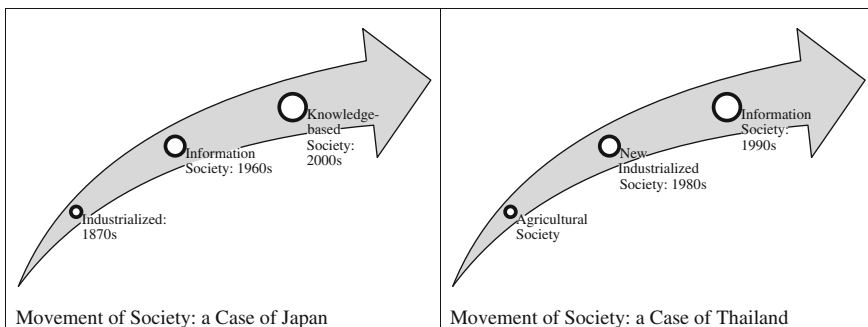


Fig. 1 Movement of society

Adaptive Innovation

The term “Lesson Study” was first translated by Makoto Yoshida from the Japanese term “Jugyo Kenkyu” and was popularized by Stigler and Hiebert (1999) in the Teaching Gap. If lesson study is a way to improve daily teaching practice or teaching profession “*Kounaikenshuu*” (*in school professional development*) is the word used to describe the continuous process of school based professional development that Japanese teachers engage in once they begin their teaching careers (Yoshida 2007). One of the most common components of *Kounaikenshuu* is Lesson Study (Stigler and Hiebert 1999). Lesson study is an innovation that was developed and implemented in Japan around 140 years ago (Isoda 2004; Shimizu 2006) and has been attracting attention around the world (Isoda and Nakamura 2010). It has been recognized and used for teacher professional development in many countries around the globe. In Thailand, lesson study started in 2002 by preparing the context for applying innovation. Several possible areas of implementation were identified and these included: (1) the teacher preparation program, (2) the graduate study program, (3) in-service teacher education, and (4) long term teaching professional development which was used with fourth year students practicing their internship in 2002 (Inprasitha 2011).

The implementation of lesson study was supplemented with the ‘Open Approach’ using open-ended problems in mathematical activities with fifteen 4th year student teachers teaching in seven secondary schools in Khonkaen City in 2002 academic year. Lesson study was implemented implicitly without using the term “Lesson Study” (Inprasitha 2004, 2007). This phase was called “*Incubation of the Idea*” (Fig. 2; Inprasitha 2011).

In the years 2002–2005, the open approach was expanded to two districts in Khonkaen Province. More than 800 teachers were introduced to the use of open-ended problems to help them create rich mathematical activities in their classrooms. This phase was called “Experimentation in Some Schools” (Fig. 3; Inprasitha 2011). In 2004, leading teachers were expected to have the understanding and skills in the development of lesson plans by using lesson study. In addition, they were required to implement the plans in actual classrooms, to follow up on the results, and to share their practice with



Fig. 2 “Incubation of Idea” in 2002 academic year



Fig. 3 “Experimentation in some schools” in the years 2002–2005

other teachers in their district. The project evaluation was carried out through project exhibitions and presentations. Based on the positive outcomes, the project has proved to be valuable in teacher development. All leading teachers were interested in participating in the activities in order to fully enhance their capacity. The continuous effort in expanding the knowledge to the network teachers in the other education areas was one of the evidence showing the success of this study (Inprasitha 2006).

In 2006, the Center for Research in Mathematics Education (CRME), Khon Kaen University, Thailand and Center for Research on International Cooperation in Educational Development (CRICED), University of Tsukuba, Japan proposed to APEC the project “A Collaborative Study on Innovations for Teaching and Learning Mathematics in Different Cultures among the APEC Member Economies”. This project was unique in terms of collaboration. It was an attempt between Japan as a developed country and Thailand as a developing country to seek collaboration among APEC member economies to create a collaborative framework. Lesson study was selected by the delegates (specialists) from the participating economies as the collaborative framework. Each specialist with the collaboration of his/her network in each economy has been developing some “good practices” in teaching and learning mathematics that will lead to innovations in that economy (Inprasitha et al. 2006).

During 2006–2008, the CRME started a long-term collaborative project with the Ministry of Education in “Improving Mathematical Thinking using Open Approach through Lesson Study Approach.” This phase was called “Whole School Approach” Three basic phases of lesson study were incorporated beginning with the collaborative design of a research lesson (Plan), the collaborative observation of the research lesson (Do), and the collaborative discussion and reflection on the research lesson (See). In addition, in 2008, the first year cohort of student interns in schools carried out their practice in collaboration with the in-service teachers by implementing lesson study in the project schools (Inprasitha 2011).

In 2009, lesson study and open approach had been implementing in 22 schools in the northeastern and northern parts of Thailand, a collaborative project with the Office of Basic Education and Office of Higher Education, Ministry of Education. In 2010, 60 mathematics student teacher interns from Khon Kaen University and



Fig. 4 Mathematics student teacher interns participated in school project

six mathematics student teacher interns from Chiang Mai University practiced teaching at 22 project schools (Fig. 4).

Unit of Analysis for the Lesson Study Cycle

Lesson study is a direct translation for the Japanese term *Jugyo Kenkyu*, which is composed of two words: *Jugyo*, which means lesson, and *Kenkyu*, which means study or research (Fernandez and Yoshida 2004). The author pioneered the introduction of lesson study and the open approach into Thai mathematics teaching circles. The term “Lesson Study” was paraphrased by him to mean “Classroom Study” in order to make it comprehensible in the Thai context. This meaning is different from the meaning used in Japan because in Japan, the unit of study is the “lesson”, while in Thailand, the unit of study is “classroom”. The purpose of introducing these innovations into Thai classrooms was to improve the quality of classrooms using lessons as a tool for teachers to know their classrooms better from the angles of knowing their students, understanding their ideas, realizing their own roles and recognizing the classroom culture. Therefore, to introduce innovations into classroom practice it is essential to adjust the steps or processes to fit in with the working culture of each locality. In Thailand, the application of “Lesson Study” as the main means for enhancement of the mathematics teaching profession consisted of three major steps: collaboratively design of a research lesson (Plan), collaboratively observe the research lesson (Do), and collaboratively discuss and reflect on the research lesson (Figs. 5 and 6; Inprasitha 2010, 2011).

In the case of Thailand, the development of the teaching profession under the tenets of the three steps of lesson study and the open approach was initiated in order to make way for a discussion about problems the teachers have been facing, such as teaching activities that depend heavily on lecturing, explaining and asking-answering questions tersely like “right” or “wrong”, avoiding sufficient time for student participation, failing to draw out the students’ ideas, or to observe their ways of thinking while engaging in problem-solving activities, etc. The author has embarked on the development of the open approach as a new method of teaching

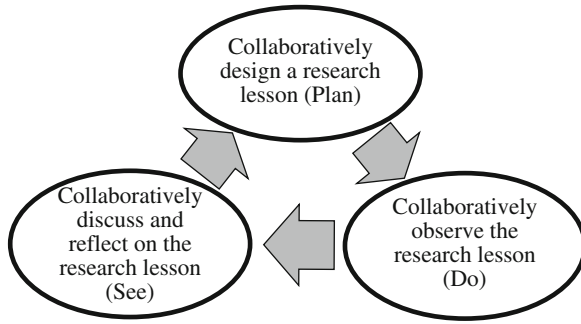


Fig. 5 Adaptive lesson study in Thailand

Collaboratively Plan

Teachers Expert School Coordinator Thai Textbook Japanese Textbook

Teachers, the school coordinator, the graduate students and outside experts tried to select the materials and content to be taught as open-ended problems and shared in designing materials and instruments to be appropriate for the students' activities or ages.

Collaboratively Do

Teacher Observer

A member of the lesson study team teaches the research lesson in a classroom, with observation by other teachers, researchers and experts. Observation focused on students' response to open-ended problems and students' way of thinking.

Collaboratively Reflect

Principal Expert Teachers Teachers Graduate Student School Coordinator

This phase is very important and had never happened before, with participating teachers reflecting on their teaching practices every Wednesday or Thursday.

Fig. 6 Collaborative plan, do, and reflect

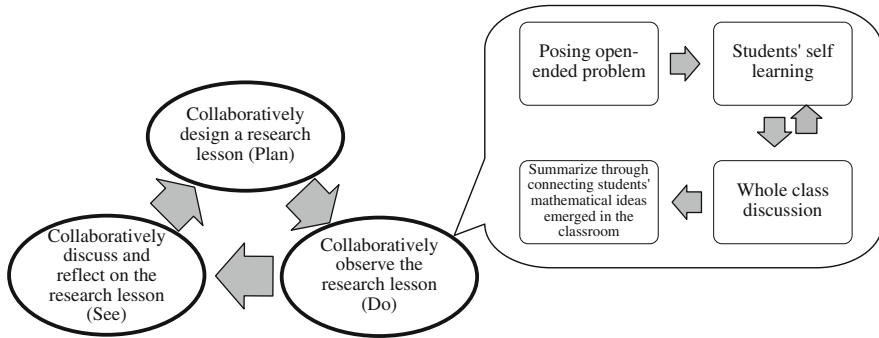


Fig. 7 Four phases of the open approach incorporated into lesson study

that emphasizes problem-solving process (Inprasitha 2010, 2011), which is integrated with lesson study. The four phases of this teaching approach are: posing of open-ended problem, students’ self learning through problem solving, whole class discussion and comparison, and summary through connecting students’ mathematical ideas that emerged in the classroom (Fig. 7).

How to Form Lesson Study Teams

The most difficult part of implementing lesson study in schools in Thailand is how to form lesson study teams. We do not have senior or expert teachers in schools like those of Japan. We also lack external knowledgeable persons (knowledgeable others) to support the schools. In order to have effective lesson study team in the project school, Faculty of Education, Khon Kaen University has prepared our graduate students in master degree programs in mathematics education, which was first offered in 2003 as part of the workshops organized by the Faculty during 2003–2005. We organized our workshop into small groups mixing both teachers, school principals and supervisors. The graduate students observe the working groups and then reflect on what they observed after the group members presented their work.

The graduate students provided a chance for school teachers to reflect on their traditional roles. In 2006, when we started to fully implement the idea of lesson study and the open approach, our graduate students were assigned as members of lesson study teams working closely with teachers at the school that served as their research site. Thus, each lesson study team is composed of three classroom teachers from grade 1, 2, and 3, a graduate student, one teacher from another grade (option), the principal (who mostly attended the reflection session). A team for grades 4, 5 and 6 or for grades junior 1, 2, and 3 is formed in a similar manner. Three steps of lesson study have been practiced as follows: Monday or Tuesday was set for collaboratively planning the lesson for each team. One teacher teaches according to the usual timetable during the week. Then, all teachers in that school with the school principal joined the reflection session at the end of the week, on either

Thursday or Friday. The author adapted many steps of lesson study by putting a revision step into yearly cycle. This made it possible for the three-step lesson study to take place on a weekly cycle. Thus, we can plan to do lesson study every week while still covering all the content for which teachers are responsible. This adaptive version allowed teachers to be more comfortable using innovations like lesson study and open approach in their classroom. They feel like they have outside knowledgeable persons to help them improve the classroom, rather than feeling that they are burdened with more extra work.

Khoo Kham Pittayasan School is an extended school (1st grade to 9th grade). There were 180 students and eighteen teachers during 2010 academic year. The school has been participating in the project since 2006. In 2006, the school implemented three phases of lesson study in the 1st grade, the 4th grade and the 7th grade. In 2007, they extended lesson study to six classrooms: 1st grade, 2nd grade, 4th grade, 5th grade, 7th grade and 8th grade. From 2008 to the present, they extended lesson study to nine classrooms: 1st grade, 2nd grade, 3rd grade, 4th grade, 5th grade, 6th grade, 7th grade 8th grade and 9th grade. For all 18 teachers to participate in the three phases, especially the reflection phase, the school arranged the schedule (Table 1). The school principal took leadership in the reflection phase and it is obligation for all school teachers had to participate in this phase.

Lesson Study Team Member Participation

According to the schedule members of the lesson study team could participate in the lesson study activities in weekly cycles. The author surveyed the participants to determine to what extent lesson study teams were involved in lesson study activities.

During the “Plan” phase, it involved the researcher, school coordinator, co-researchers, and participant teachers to collaboratively design a research lesson (Plan). During this phase mathematics problem activities were chosen using open-ended problems based on a Japanese mathematics textbook. The materials to be used in the classroom were then developed. This was conducted once a week. Figure 8 shows the percentage of participating members during the Planning Phase at one of the participating schools, the Khoo Kham Pittayasan School.

During the “Do” phase, the lesson study group collaboratively observed the research lesson (Do) and implemented the lesson plan of the school teacher in the classroom. In addition, the classroom teaching was observed by the research team, school coordinator, co-researchers, and other teachers. The objective of the observation focused on the students’ thinking approach, and not on the teacher’s teaching competency. Figure 9 shows the percentage of participating teachers in the “Do” phase at the Khoo Kham Pittayasan School.

During the “See” phase, the team collaboratively discussed and reflected on the research lesson, and examined the findings of the teaching observation for improving the research lesson. The research lesson was then revised with a view of using it again in the following year. This phase was conducted once a week.

Table 1 Lesson study schedule

Grade	“Plan”	“Do”	“See”	LS team
1st	Every Tuesday starting at 14.30	Monday, the 1st period Tuesday, the 1st period Wednesday, the 1st period Thursday, the 2nd period Friday, the 2nd period	Every Thursday starting at 14.30	1st grade teacher, junior high school science teacher, 1st grade mathematics student teacher intern
2nd		Monday, the 2nd period Tuesday, the 3rd period Wednesday, the 1st period Thursday, the 1st–2nd periods		2nd grade teacher, 2nd grade mathematics student teacher intern, 3rd grade mathematics student teacher intern
3rd		Monday, the 3rd period Wednesday, the 2nd–3rd periods Thursday, the 3rd period Friday, the 1st period		3rd grade teacher, 3rd grade mathematics student teacher intern, 2nd grade mathematics student teacher intern
4th		Tuesday, the 1st–2nd periods Thursday, the 1st–2nd periods		4th grade teacher, 4th grade mathematics student teacher intern, 5th grade mathematics student teacher intern
5th		Monday, the 1st–2nd period Wednesday, the 2nd–3rd periods		5th grade teacher, 5th grade mathematics student teacher intern, 4th grade mathematics student teacher intern
6th		Monday, the 2nd–3rd periods Tuesday, the 3rd period Wednesday, the 3rd period		6th grade teacher, 6th grade mathematics student teacher intern, 1st grade mathematics student teacher
7th		Monday, the 1st period Thursday, the 2nd–3rd periods		junior high school mathematics teacher, 7th grade mathematics student teacher intern
8th		Tuesday, the 2nd period Wednesday, the 2nd–3rd period		junior high school mathematics teacher, 7th grade mathematics student teacher intern
9th		Thursday, the 1st period Friday, the 2nd–3rd periods		junior high school mathematics teacher, 7th grade mathematics student teacher intern

A unique feature of this phase is that the school principal took leadership in running this session and this motivated all the teachers in school to attend the session. Figure 10 shows the percentage of the participating members of the lesson study group at the Khoo Kham Pittayasan School in 2010.

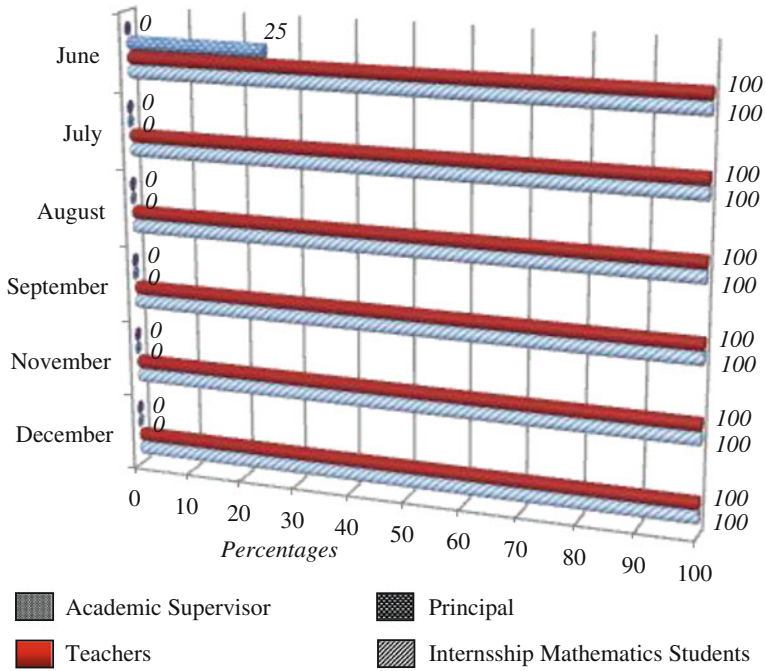


Fig. 8 Percentage of participating teachers during the “Plan” phase at Khoo Kham Pittayasan School in 2010

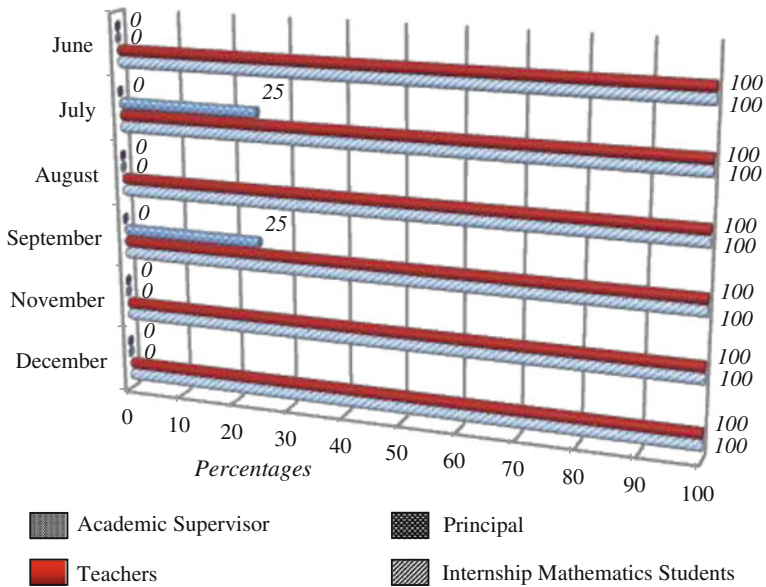


Fig. 9 Percentage of participating teachers in “Do” Phase at Khoo Kham Pittayasan School in 2010

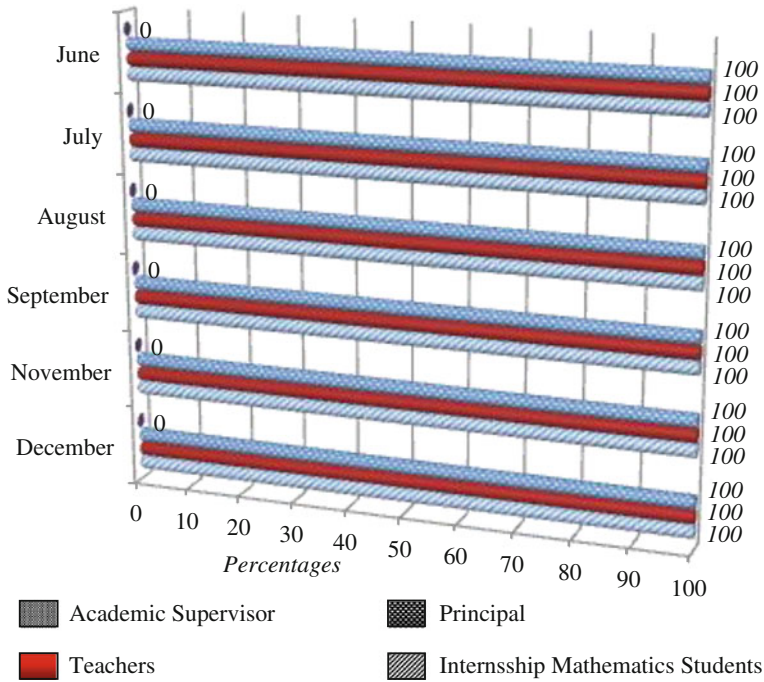


Fig. 10 Percentage of participating teachers in the “See” Phase at the Khoo Kham Pittayasan School in 2010

Eliminating the “Revision Step” from the Weekly Cycle

Most of the teachers were concerned about covering all the content specified in the curriculum. So, we implemented lesson study in weekly cycles to cover all the content they have to teach. Only the basic steps of lesson study, that is “*Collaboratively plan*”, “*Collaboratively do*”, “*Collaboratively reflect*”, were implemented during the *weekly cycles*. Teaching the revised lessons in the weekly cycle seemed to be difficult for the teachers. When adding the fourth step; “*revise the lesson*”, the cycle was changed to a yearly cycle.

Conclusion and Suggestion

The Japanese professional development known as lesson study and the organization of learning activities based on the ideas of the open approach are rather new to the conventional Thai education context and culture. So, in any attempt to apply the ideas to the development of the teaching profession in Thailand it is necessary to take these two factors into account. It has been our experience when attempting to prepare

ground for the introduction of the ideas into Thailand that the Thai social and cultural contexts are very influential in shaping the mode of developing the Thai teaching profession. It can be seen clearly in the teachers' role in the mathematics learning activities. It must also be noticed that the teachers' role is one of the factors that influences the students' way of expressing their thoughts. A change from the teacher's former role that emphasizes giving lectures, doing exercises on the board as examples for the students to see, and then drawing conclusions at the end of each lesson, to a new role of organizing learning activities that emphasizes students learning through the open approach is crucial. The teachers must also avoid behaving like a knowledge provider or try to give hints for correct answers. Rather, they should act in such a way as to stimulate the students to think by switching from the normal way of asking questions with the purpose of verifying the correct answers, to a new mode of inquiry that stimulate students to reflect on their own ideas. All of these ideas and practices are new to Thai teachers. Indeed a longer period of time is needed for the development of the teaching profession and for the change in teachers' teaching behavior.

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