

## **Disseminating and Popularising Lesson Study in Malaysia and Southeast Asia**

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### **Abstract**

*Over recent years Lesson Study has become more popular as an on-site school-based teacher development approach. This paper traces the beginnings of Lesson Study in Malaysia, its challenges and the road ahead in popularizing the Lesson Study approach, and also efforts by the Regional Centre for Education in Science and Mathematics (RECSAM) to popularize Lesson study in the Southeast Asian region.*

### **Introduction**

#### *Teachers and Student Achievement*

It is a widely accepted notion that teachers play an important role in ensuring the success of a country's education system. This notion seems to have been further acknowledged by educators in their search for factors that are linked with educational success. In the past twenty years various international benchmarking studies have been conducted presumably to serve as a gauge for the improvement of education. Among these are the well known *Trends in International Mathematics and Science Study* (TIMSS) and the *Programme for International Student Assessment* (PISA). As a result of the TIMSS and PISA, much international attention was drawn to high performing countries such as Japan, Singapore and Finland. Educators, who visited these successful countries in search of the success formulae, were often reminded that teacher quality was one common factor that has played an important role in the success of these countries in the international studies (Stacey, 2009). Moreover, the positive link between teachers' knowledge and students' mathematical achievement has also been reported in recent research (Hill, Rowan & Ball, 2005).

#### *Continuing Professional Development for Teachers*

While it may be acknowledged that teachers play a crucial role in the educational system of any country, the process of developing good teachers however is a much more complex task. Teaching is a rather unique profession. Unlike many other professions, prospective teachers bring with them some prior knowledge about the profession. Even before enrolling for training to qualify as teachers, prospective teachers would have built prior images of how teaching would be like based on their learning experiences as students. While this may be advantageous for the prospective teacher, it sometimes brings along images of traditional practices that would be sometimes difficult to unlearn. Teacher development therefore involves both the unlearning of these traditional images as much as the creating new desirable images of current trends of teaching practice. Teacher development therefore involves the continuing task of unlearning old ways and learning new knowledge. Pre-service teacher education therefore marks not the end but the beginning of the task of moulding better teachers. One of the tasks in this endeavour would be to continuously develop teachers' knowledge.

Granted that pre-service training primarily aims at providing teachers with the basic knowledge for teaching, in-service training (INSET) then complements to further and continuously develop teachers' knowledge and skills.

#### *In-service Training in Malaysia*

In Malaysia, INSET is often associated with teachers attending courses and workshops to learn new pedagogical knowledge and skills. Teachers who attend INSET courses are often required to train other teachers when they return to their schools. Fiscally, this serves as an efficient return on investment, as more teachers would be exposed to new pedagogies and theories in the quickest time possible. Its effectiveness is however questionable as the issue often arises as to whether the new knowledge learnt is actually translated into real classroom practice. The solution to this problem thus centres on the need for school-based on-site teacher development models that can be used to encourage teachers to reflect on their classroom practice in order to complement the training the teachers receive from attending courses and workshops. Action Research was one such model introduced in Malaysia some 15 years ago.

#### *Action Research in Malaysia*

Action research (AR) was first introduced in Malaysia as part of the Programme for Innovation, Excellence and Research (PIER) which was financed by the World Bank in 1993. The main thrust for PIER was to improve four main educational areas: Innovations in science and mathematics, small and isolated schools, distance education and educational research. Action Research was the model that was chosen to promote educational research among school teachers. It has been reported that AR continues to be one of the thrust of the Ministry of Education (MOE) of Malaysia to promote reflective teacher development. Subsequently research committees at the State Education Department and AR research groups at the state level have been set up to further promote AR (National Institute for Educational Policy Research, 2006). At present an annual research seminar is organized for teachers at the national level to showcase and to share the teachers' AR projects (Educational Planning and Research Division, 2007). To further improve the action research programme in schools, the MOE has suggested four measures: a) Increasing the financial allocation for this programme, b) Introducing the management of change training for school administrators, c) Improving monitoring mechanism, and d) Developing training modules such as standardized training procedures and processes so that teachers who have not been given the opportunity to attend courses can use these materials for their project (National Institute for Educational Policy Research, 2006). These suggestions implicate the need for a further re-conceptualisation of the AR approach of professional development. Granted that the AR teacher development programme has achieved some success, common observation is that it is not widely practised in schools. Introducing other alternative on-site teacher development approaches such as Lesson Study could perhaps further strengthen school-based teacher professional development.

### **Lesson Study as a Teacher Professional Development Model**

#### *Globalisation of Lesson Study*

Lesson Study (LS) has its origins in Japan. It was perhaps Japan's unintentional best kept secret of its best practices particularly of its mathematics teachers until the 1990's. When LS was highlighted in the book *The Teaching Gap* (Stigler & Heibert, 1999) as one of the attributes of successful lessons by Japanese mathematics teachers, it caught the attention of mathematics educators world-wide. Teachers and educators in the United States, for example began to embrace LS as the trend in continuing professional development (CPD) programmes for teachers. Lewis (2004), for example, argues that teachers in the United States could learn a lot through LS programmes. Lewis (2004) further elaborates on four essential features of the Japanese model of LS: (1) Sharing a long-term goal by practicing teachers, (2) focusing on the importance of lesson content, (3) studying student learning and development in detail, and (4) live observations of research lessons.

### *Lesson Study in Malaysia*

In the age of globalization it is perhaps not unexpected that new innovations sometimes do not arrive directly from the country of origin. This seems to be the case of the arrival of LS to Malaysia which came through its network with educators from Australia (Department of Education and Training, 2003). The first accounts concerning the use of the Lesson Study approach in Malaysia were reported at the Universiti Sains Malaysia, Penang.

In June 2004, Lim and Chiew (see Lim, White & Chiew, 2005; Chiew & Lim, 2005; Chiew, 2009) initiated the first Lesson Study project in two secondary schools in Kulim, Malaysia. The main aim of the project was to explore if Lesson Study could serve as an alternative model for mathematics teacher professional development. Eight mathematics teachers from each school participated in the study. The project began with an introductory workshop conducted by an Australian educator, Professor Allan White. At the end of a year-long intervention, one of the participating schools had undergone three Lesson Study cycles while another school had completed only two cycles. Nevertheless, both project schools responded positively to the Lesson Study model of teacher professional development, albeit with one of the schools showing keener interest in implementing the project. All the 16 participating mathematics teachers espoused positively that Lesson Study has (a) promoted a collaborative culture that enhances their professional collegial bonds with their colleagues; (b) helped them gain and enhance their mathematical and pedagogical content knowledge through group discussion and peer observation; and (c) allowed and encouraged teachers to prepare better student based activities that constitute good practices of mathematics teaching and learning. In fact, one of the project schools has continued with their lesson study group even after the project ended in June 2005.

In view of the potential benefits of lesson study in promoting collaboration and good teaching practices, another two schools: one primary school and one secondary school were persuaded to set up their Lesson Study group in 2006: The Lesson Study group in the primary school was led by the school's senior assistant, who was then pursuing the Lesson Study project as a formal study for her master's degree (see Goh, 2007). Likewise, the secondary school was included in this project after an informal introduction to Lesson Study to the Mathematics Department Head of the school, who was also a 'master teacher' based on his innovative and effective teaching record. Both teachers were very keen and have assumed a leadership role to set up lesson study groups in their schools. They have shared their experiences of implementing Lesson Study in one of the local conference (see Goh, Tan & Lim, 2007).

Encouraged by the positive feedback, Lim (2006) expanded the concept of Lesson Study to her pre-service mathematics teachers. She found Lesson Study process has helped to promote peer collaboration as well as enhancing pedagogical content knowledge among the pre-service mathematics teachers. The Lesson Study project was continued to involve pre-service mathematics and chemistry teachers for the 2007 and 2008 cohorts.

In the year 2007-8, Lim set up a research team which consisted of five mathematics educators and three mathematics teachers. The three mathematics teachers were the leaders of each lesson study group in the three participating schools. Each lesson study group managed to promote the use of GSP among the participating teachers, albeit, in different degrees of achievement due to various factors such as time constraint and teacher commitment. A book entitled, "Innovative Use of GSP through Lesson Study Collaboration" (Lim & Kor, in press) is due to published based on this project. Besides, the various team members have shared and disseminated their research experiences in various international and national conferences (see Kor & Lim, 2009; Lim, Chew, Chiew & Goh, 2009).

In 2008, in a collaborative project involving SEAMEO-RECSAM and Universiti Sains Malaysia [USM], lesson study groups were set up in 10 primary schools with the aim to promote mathematical thinking and communications among pupils. Hence, up to 2009, there were at least 10 primary schools and five secondary schools in Penang and Kedah who had participated in the Lesson Study projects.

### **The Pilot Lesson Study Project in Malaysia**

The APEC Lesson Study Project 2006 – 2008 was hosted by the Asia Pacific Economic Caucus (APEC), Tsukuba University, Japan and Khon Kaen University, Thailand. The yearly cycle of the project comprised of three phases: the planning conference hosted by Tsukuba University, followed by the implementation stage in each participating country and finally at the reporting stage at a conference held at Khon Kaen University. The project was well participated with representations from APEC economies. Universiti Sains Malaysia (USM) represented Malaysia in the project beginning 2006 and the Regional Centre for Education in Science and Mathematics (RECSAM) joined the project in 2007. The APEC-Tsukuba Lesson project spawned a pilot Lesson Study project in Penang in 2008 which was jointly conducted by RECSAM and USM.

#### *Objectives of the Project*

The Pilot Project was planned with the following objectives:

1. To enable the teachers to experience how mathematical thinking can be incorporated into mathematical tasks.
2. To enable the participants to plan lessons focusing on mathematical thinking and communications.
3. To enable the participants to carry out the lessons according to the lesson plans
4. To collaboratively analyze the video-taped lesson and to improve on the lesson plans

#### *The Project*

Five workshops were organized between January and March 2008. The aim of the workshops was to introduce the key concepts of the project to the participating teachers: mathematical thinking, communication, lesson study and lesson planning. The workshop activities were hands-on and included activities where the teachers took part in mathematical problem solving, discussions based on videos showing the teachers how mathematical thinking activities could be integrated into the lessons and videos showing the lesson study process from Japanese and Malaysian primary classrooms (Japan International Cooperation Agency, 2006). During the fourth and fifth workshops the teachers gathered in groups, with teachers from the same school in the same group, to discuss and plan the research lessons. It was found that the two workshops of two hours each did not provide enough time for the teachers to complete the lesson plans, so the lesson planning was continued by the teachers in their respective schools with the assistance of facilitators from *Universiti Sains Malaysia* and *RECSAM*. Each group then chose a teacher from the group to teach the research lesson while the others observed. All the lessons which were carried out in May and June 2008 were videotaped. Each of the lessons was planned for 40 minutes to one hour. However, some of the actual lessons did not go as planned and took more than an hour to complete. For each group there was a post lesson discussion where the lesson was analyzed and suggestions were offered to improve it. A final workshop was held in June 2008 where the teachers analyzed and discussed the lessons based on the lesson videos.

#### *The Project Participants*

Initially eight primary schools accepted the invitation to join the project and three teachers from each school attended the workshops. One more school joined the project later but by the end of the project there were six schools which were still involved in the project. Although the attrition rate seemed high, it should be noted that the teacher participants joined the project on a voluntary basis with the support of the respective school head masters. The workshops were also held in the afternoons only so as to avoid the teachers having to leave classes to attend the workshops. It was therefore noted that the teachers' participation in the project was in addition to the already heavy workload of the teachers in school. It was further noted that the teachers' participation would not have been possible without the support and commitment of the school headmasters. The commitment of the school headmasters and the teachers was a critical factor that ensured the success of the project.

Data from the project were collected through questionnaire and interviews with the teachers and school principals. The research lessons were also videotaped. A questionnaire was completed by the teachers at the end of each workshop primarily to track the teachers' reactions and the progress of the teachers' learning. Analysis of the data was done primarily using the interpretative approach.

### *Teacher's Reaction*

Through the questionnaires and informal interviews it was found that the teachers were initially positive about both the use of mathematical thinking in their lessons as well as about LS. When asked, "What features would you like to integrate in your lessons?" after watching the LS videos from Japanese and Malaysian classrooms, the teachers were able to relate the activities as well as identify features in the videos to integrate into their teaching practice.

*"Integrate daily life activities including games." "Students have the things (blocks) to find the answers then give the explanations; All the students pay attention, all students take part in group activities."*

The teachers were however also aware of the difficulties that they might face in real classrooms.

*"Yes, teacher must notice: all students can do it, control the students, take care of class discipline." "Yes, for small enrolment. No, if classroom is big. No, if pupils are of mixed learning ability."*

By the end of the project, all the teachers expressed confidence about using the LS approach. *"L.S. is very helpful especially to those new teachers." "It is a very useful approach in the teaching and learning process which helps the pupils to think and answer the questions through their activities in order to get the concept of such topic." "No longer use teacher-centered method. But use ways that are fun and students can learn more deeply." "Yes. It would be very useful and benefit to our pupils by using this approach."*

### *Teachers' Learning*

*Lesson planning.* Writing lesson plans is one area that has been given much emphasis in the Malaysian teacher training programme. The weakness however is that writing lesson plans could become routine that teachers would just extract the lesson objectives from the national curriculum and then fill in the lesson plan with activities from resource books and textbooks. This would lead to less creative lessons. Thus the participating teachers initially found it difficult to plan activities that could help the students think mathematically. Group planning was helpful, as the teachers began to build on team members' ideas, adding and refining until a final activity was created. Further the post lesson discussion helped the teachers see what did not work and thus they were able to modify the lesson.

*Teacher discussion.* The teachers also found that teacher discussion was an important part of the project. *"Through lesson study teachers get to learn knowledge and new techniques for teaching." "By exchanging views and ideas about teaching and learning among colleagues."*

*Mathematical thinking.* From the lesson planning sessions it was observed that the teachers found it difficult to create mathematical thinking activities. Several of the teachers further spoke of the need to attend more courses on mathematical thinking. Some suggested that there be modules on mathematical thinking and communication. From these observations it was inferred that the teachers have become aware of the importance and the need for them to learn more about the use of mathematical processes in the classroom. However, the teachers felt that they still do not possess adequate knowledge on the use of mathematical thinking in the lessons.

### *School Support*

The support of the school headmasters and administration played a vital role in the success of the pilot project. In order that LS was able to be carried out in the schools, there were interruptions in the class time-table as it was difficult to find a common time when all the participating teachers were available.

Thus relief teachers had to be arranged so that the all the participating teachers were able to observe the research lesson. There was thus added administrative work for the schools but the headmasters of the schools involved indicated that they were supportive of the pilot study because it was a good idea to have the teachers plan the lesson together as was expressed by one headmaster:

*“... There they sit, discuss, they share the ideas then they may .... they get more knowledge how to teach the activities. What type of activities they can teach. It is a good idea. Very good idea...”*

Although the headmasters were positive about LS, they also pointed out that there were be two major constraints to the implementation of the LS approach: 1) the need to change the teachers’ mindset, and (2) the time constraints as is required by the teachers to plan, observe and review the lessons collaboratively.

#### *Teachers’ Use of New Knowledge and Skills.*

*Lesson planning.* One of the most evident improvement was the teachers’ ability in designing new activities that require the students to think and investigate mathematically. Although there were many activities available in books and through the Internet, the teachers did not want to use them as they were not directly correlated to the curriculum. Further the teachers did not feel comfortable using investigative mathematics activities that would take a longer time to complete. Through the collaborative planning together with fellow teachers and facilitators, the teachers were able to use new ideas to either create or improvise on teaching activities.

*Mathematical thinking and communication.* While the teachers were able to create classroom tasks that could be used to generate mathematical thinking, it was observed from the lesson videos that there were still more knowledge and skills that the teachers needed to learn so as to be able to create mathematical discourse in the classroom. During the lessons, there was a lack of questions that require the students to explain the reasons behind their answers. The teachers were yet to be able to move the students into thinking deeper about the mathematical ideas and concepts. The teachers realized this and voiced that it would be helpful to have more assistance

*“Hope that the facilitators will continue to guide us.” “Module about mathematical thinking and communication.” “Need more knowledge of mathematical and mathematical communications. Try to have the workshop during school hours.” “module about mathematical thinking.”*

### **Disseminating Lesson Study: The Road Ahead**

The findings from the Pilot study showed the potential of LS evolving into a pertinent and relevant form of school-based CPD in Malaysia. Its main advantage over Action Research is that Lesson Study involves the actual studying and examining of real lessons with the aim of improving the lessons as well as the teachers’ skills and knowledge. The main task of the participating teachers was to prepare lessons, implement the lesson and to improve the lessons, which is similar to the work that teachers in Malaysia have been trained to do. This is in contrast to writing research reports which is required in AR. There are however certain challenges which were reported in initial studies on LS in Malaysia that needs to be overcome. These include 1) training teachers and disseminating the key ideas of LS, and 2) developing mechanisms to encourage the implementation of LS in schools. In view of these challenges, RECSAM has begun to embark on a plan to promote LS as a CPD approach for developing in-service teachers.

#### *Training Teachers*

RECSAM was set up in 1967 under the umbrella of the Southeast Asian Ministers of Education Organisation (SEAMEO). With the mandate to improve science and mathematics education in

Southeast Asia, RECSAM has over the past forty years trained over twenty thousand science and mathematics teachers in its in-service development programmes. Several types of courses are offered and since 2008, Lesson Study has been included in its training programmes.

*Regular courses.* RECSAM offers full scholarships for teachers from the SEAMEO member countries for a one-month regular course at RECSAM. About 90 science and mathematics teachers are offered scholarships to be trained in various fields pertaining to pedagogy and research yearly. Beginning 2008 until 2015, one course on Lesson Study is planned every year. In 2008 and 2009, twenty SEAMEO teachers participated in the course. During the course the participants are trained in the various aspects of implementing Lesson Study. These include hands-on student try-outs as well as video-taping live lessons for comments and improvement. During the course the teacher participants are also facilitated to plan multiplier-effect proposals to disseminate ideas learnt to other teachers upon the participants' return to their home countries. The multiplier-effect proposals when implemented thus allow more teachers to gain knowledge about new innovative ideas in SEAMEO member countries.

In addition to the regular course for Lesson Study, all the other regular courses now have a component of a minimum of six hours on LS. The LS component is intended as an exposure for the participants of all the regular courses to the main ideas of LS.

*In-country courses.* In addition to the regular course, RECSAM also offers *In-country courses*. In-country courses are organised by the Ministry of Education (MOE) of the respective SEAMEO countries while RECSAM provides the facilitators for the course. In 2009, one In-country course was held in a primary school in Singapore which was attended by 44 participant teachers from various parts of Singapore. The three-day course included lectures as well as live research lessons. RECSAM endeavours to continue to promote LS through In-country courses in the future as it enables more teachers in SEAMEO member countries to be trained. The setback of the In-country courses however is the limited budget available for education in some of the SEAMEO countries.

*Lesson Study seminars.* In August 2008, RECSAM organised a national-level Lesson Study Seminar which was facilitated by speakers and teachers from Japan and Malaysia. The main highlights of the seminar, which was attended by a hundred teachers from Malaysia and Indonesia, was the sharing of experiences by the Japanese and Malaysian teachers. The seminar received favourable comments from the teachers towards LS. RECSAM plans to continue to hold seminars and working towards having live demonstration lessons during the seminars.

#### *Developing Mechanisms to Encourage the Implementation of Lesson Study*

All the teachers and principals who took part in the Lesson Study Pilot Project generally agreed that LS is a good approach towards teacher development as well as improving lesson quality. However, several challenges were also highlighted. Among them were the constraints of time and the need to change the mindset of teachers to engage in more progressive professional development activities. Thus attending training workshops and courses alone might not be enough to help teachers adopt Lesson Study as part of the school culture. Often it is the case of "out of sight out of mind" after teachers attend training workshops. It is envisaged that for many teachers to catch on and be committed to the idea of LS, they need to see model schools where LS is successfully implemented. To complement its training programmes on LS, RECSAM has in its plans to develop at least one model Lesson Study school by 2012. The model school project will begin in 2010 with three of RECSAM's partner primary schools.

In order that Lesson Study becomes a sustainable programme in the model school, the approach for the project will be a collaborative one involving the school teachers, supervisors, principals, officers from the State Education Department as well as the external experts from RECSAM and USM. The project will seek school-based solutions to the challenges mentioned earlier. Seemingly minor details, such as scheduling of the time table, finding a common meeting time, group dynamics to encourage team members and the regularity of research lessons are important to teachers. Thus the project intends to seek to document ways to support the school and teachers in making LS an

important part of the school culture and in doing so establish mechanisms to facilitate the implementation of LS.

With the establishment of the Lesson Study model school, it is envisaged that more schools will come to adopt LS as the school-based teacher development approach. In addition, the model school will serve as the focal points for future training of teachers. Lesson Study workshops too will then become less theoretical and more practical, thus encouraging more teachers to be involved in LS.

### Conclusion

Many innovative educational projects have often been introduced to developing countries only to see it die a natural death. These innovations seem not to be sustainable. Herein lies one of the dilemmas of teacher education in developing countries. Many developing countries have a centralised national education system which is probably more advantageous due to economics of scale. However, for any educational ideas to work, it must be firmly rooted with the practitioners, i.e. the teachers. But very often projects do not get started until the ideas or instructions come down from the top. The Smart School Project in Malaysia, for example, has been regarded as highly successful in creating 87 Smart Schools with ICT infrastructure that is comparable with that of developed countries. However, as was noted the challenge to further develop the Smart Schools has been constrained by gaps in its top-down consortium model (Sullivan & Frost, 2004). Thus while the top-down model has been highly successful in creating the Smart Schools, the lack of teacher involvement at the grassroots have slowed down the initial success of the Smart Schools. A lesson learnt is that for developing countries a top-down approach is vital to initiate any innovation. Yet to sustain and further establish and extend the innovation, it is important to involve the teachers. Thus in order to establish Lesson Study, a collaborative approach which involves key personnel right from the top to the bottom of the institutional hierarchy is critical for its continuing success. Most of all, the commitment and involvement of the actual practitioners who are the teachers remains the most essential ingredient to the success in the implementation of Lesson Study in Malaysia as well as to other developing countries in the region.

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