# Teacher Self-Development as Researcher in Lesson Study and Open Approach Context: A Case Study of a Grade 1 Teacher

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*This research analyzes the development of a teacher as a researcher in the Lesson Study and Open Approach Context for the Mathematics Professional Development with Lesson Study and Open Approach Innovation program. The teacher had had more than 20 years of teaching experience before joining the program in 2006 until 2013. The ethnographic paradigm used in collecting the data provided in-depth information during the 2010-2015 academic years. The data collected from the documents, video, and the interview protocol, were analyzed. Analytical information was obtained from the teaching practice in relation to the teacher's professional development, relevant to the implementation of the Lesson Study process. The findings show that (1) In the forming stage of the corporate lesson plan, the teacher has realized the problem, of allowing her to plan better lesson management to improve her teaching; (2) In the implementation stage of the Open Approach in a classroom, the teacher had observed problem solving abilities of students. She recorded their thoughts as input for her reflection on the result of thelesson study; and (3) In the reflection stage with the Lesson Study team, the teacher and the team analyzed the result of the lesson management, problem solving abilities of students and media usage from the observed data.*

**Keywords:** Teacher as Researcher, Lesson Study, Lesson Study and Open Approach Context

## Introduction:

One of the major problems with Thai teachers is conducting research. To this point, Associate Professor Dr.Suladda Loipha and Assistant Professor Dr.Maitree Inprasitha (Loipha & Inprasitha, 2003) posited that most Thai teachers consider research to be a difficult process even when they acknowledge the relevance of classroom research and its potential to solve teaching and learning problems. For them, conducting research is time-consuming and affects their teaching and learning schedules. They also lack competence in research methodology. Nevertheless, teachers in other countries around the world are also as guilty of this situation similar to Thai teachers.According to Parsons and Brown (2002), when it comes to "research" for many teachers, there may be confusion, worries and problems of using a large number of samples requiring expertise in statistics and computer analysis. Many teachers feel that they lack the essential skills and motivation needed to be a researcher, or even "take action"based on research.

In Europe and America, there is a movement in educational research by the people involved with real classesand real instruction. The instructors themselves have been collecting the data to the extent that many educators and agencies are now involved in promoting self-directed teachers. McCutcheon (1981) claims the traditional model was that the researchers were outsourced to doing classroom research which resulted in the

dissatisfaction of the teachers in this model.(You must i8ndicate page number for a direct quotation). For example, outsiders often have questions about a small number of teachers. When teachers were trained, they were not told to do research. Therefore, they believe that they have to do their own thing while the outsiders just give advice on what they should do. Also, external researchers often conduct research at specific times. This may result in inaccurate information. Lerman (2010) stated that even attending the International Group for the Psychology of Mathematics Education in the 1980s and 1990s was a problem to most teachers as only a few attended the conference and often, did not pay attention to the conference activities. Presentation of classroom work (practical work) did not receive the attention it deserved.

Many educators have studied and researched the research needs of teachers. Lewis (2002) and Lewis, Perry, and Hurd (2009) pointed out that Lesson Study is a system of research and development. This helps the teachers to adjust their concept of best practice through careful classroom study. One of the principals in the United States, Liptak, (cited in Lewis, (2002)(Delete first name and date of publication required)applied the Lesson Study in her school and proposed that the Lesson Study puts teachers in a position of enthusiasm as a researcher. Doing research help the teachers to know what to do in order to improve their classroom teaching. The development of a new teacher-based Lesson Study involves different stages in classroom education, for example, writing a lesson plan together, sharing class observations, and reflecting on the results as research.

Lewis (2002) noted that the Lesson Study is the main form of teacher professional development. In the Lesson Study cycle, teachers engage in goal setting and student learning development, design lesson plans that support learning goals, and observe and discuss selected research classes. Isoda and Katagiri (2012) also stated that Lesson Study with classroom teaching is a system of planning and forwarding instruction that is designed to challenge teachers to create new teaching approaches, be aware of the possibility of intellectual growth and responsibility of the learners, along with promoting self-confidence. It consists of the following sequence: first, planning is to prepare the lesson rather than do the lesson (predictive possible learning). Second, the order of action (to do) is to provide lessons to students, and at the same time, be observed by other teachers. Third is to reflect on the learning outcomes through a joint discussion. In addition, teachers work together in planning and analyzing their teaching, and create a system for teachers to learn from each other experiences (Stigler and Hiebert, 1999).

In addition, Lesson study is a guideline for professional development on the basis of collaboration which originated from Japan (Fernandez and Yoshida, 2004; Stigler and Hiebert 1999; Murata, 2011). It has one important feature, a research lesson (Murata, 2011; Lewis, 2002; Lewis, Perry, and Friedkin, 2009; Fernandez and Yoshida, 2004). The teacher shared the observation experience with each other and provided opportunities for teachers to be researchers (Murata, 2011). Another important feature is a reflection process on their teaching practices and reflecting on student learning. Moreover, teachers who have acquired knowledge of how to practice reflection shared it among people or a broad community (Murata, 2011).

As mentioned above, the concept of Lesson Study can conclude that Lesson Study is professional development system carry on as research process based on team of the teachers collaboratively set goal to develop their classroom. (Stigler and Hiebert, 1999; Lewis, 2002; Fernandez and Yoshida, 2004; Lewis, Perry& Murata, (2006); Lewis, Perry and Friedkin, 2009; Murata, 2011; Isoda and Katagiri, 2012).

Assistant Professor Dr.Maitree Inprasitha, a director of the Center for Research in Mathematics Education, Faculty of Education KhonKaen University, the first person who brought Lesson Study to Thailand in 2002. He was a Japanese government scholarship student who graduated from Tsukuba University. He adopted the principles of Lesson Study with teaching approach called Open Approach. These two innovations were first published for teachers and supervisors, including 15 secondary education students in science-mathematics major. Together they created a Lesson Plan in an Open Approach Style and applied it in the undergraduate curriculum in the four-year undergraduate program in secondary education, Faculty of Education, KhonKaen University, by conducting one semester experiment in the year 2002 using English textbooks as the main guide in teaching Mathematics. The year 2003 was the founding year of the Center for Research in Mathematics Education (CRME), Faculty of Education, KhonKaen University, to implement teacher development projects using innovative Lesson Study and Open Approach in the form of various activities in conjunction with both domestic and international educational institutions. The Research Project on Development of Prototype Schools for the Reform of Learning Process, in collaboration with many educational agencies and KhonKaen University in the Northeast (2006 to present) was performed by the CRME, KhonKaen University (MaitreeInprasitha, 2003, 2005, 2006, 2011, 2014).

In this research, the researcher is interested in studying self-development of a teacher participating in the program of Lesson Study and Open Approach and the process of her self-development to become a teacher as researcher.

**Case Study and Research Context:**

The Subject is a 61 years-old woman who has a teaching career for more than 30 years. She taught Mathematics and Thai language in Grade 1 and worked at one of the schools in Sumsoong District, Konkaen Province. In addition, she was mentor of student internship from KhonKaen University, Mathematics Education, who taught in mathematics of grade 1.

She graduated with a bachelor's degree on education in teaching Thai language. The case was purposive sampling for this research because her practices performed completely riches data according to Yin (2014). Her teaching practices done by Lesson Study and Open Approach activities since 2006 to present.She had a good cooperationwith CRME and this research, always joint in open class, workshop, every level of conferences, and had open minded for comment about her teaching. The participants discovered the principles and practice guidelines of teaching methods in an Open Approach, she then adapted and attempted to use the principles recommended by experts to the students in her classes. By implementing these new teaching approaches, the participant found that the students are more confident to express their opinions. Consequently, the participants gradually turned her attention to the operation of both innovations even more.

This school is headed in "The development of professional mathematics teachers with Lesson Study and Open Approach innovation" under the supervision of the CRME, KhonKaen University (2006-present). In this school, the administrators and teachers are happy to participate in the project. They possess the characteristics of a whole school approach. This school is a small size Educational Opportunity Expansion School, from kindergarten to secondary grade 3, with an average of 200 students and 16 teachers a year. The school is classified as a small school in the rural area of Khonkaen province that is about 40 kilometres from KhonKaen University.

The school had attended the Project Situation Analysis education in 2006-2007 where the school's management system was analyzed in order to find ways to integrate the use of Lesson Study and Open Approach. The problems of the teachers, analyzing the necessary equipment needs, school constraints and finding solutions, including the role and involvement of those involved in the use of the classroom and the Open Approach was performed by the CRME, KhonKaen University. The workshop in 2006 – 2009 was about organizing instructional activities based on Lesson Study and Open Approach during pre-semester sessions to understand and prepare for innovation in the school system including reviews and reinforcement of textbooks by the CRME, KhonKaen University.

The research area has a coordinated pre-semester program in which Lesson Study action is taken: weekly lesson plans are written, class attendance observations, a weekly reflection, open class, summary of boarding school performance, and adjusting the lesson plan.

In order to implement the Lesson Study process, a Lesson Study team was established in each class. The grade 1 Lesson Study team consisted of teachers, internship student and observer teacher. At the beginning of the first five years of operation, a school coordinator was a graduate student in the field of mathematics education, Faculty of Education, KhonKaen University, who joined the Lesson Study team. He had attended the Lesson Study activities and Open Approach activities organized by the CRME, KhonKaen University, led by Assistant Professor Dr.MaitreeInprasitha. The Director of the CRME is an expert on Lesson Study and Open Approach to school members from the beginning.

## Research Methodology:

This ethnographic research is a case-based study with the researcher as the studied case in data collection (2010 – 2015). The researcher participated in all the school activities related to Lesson Study and Open Approach using field notes to record the activities. Field notes contained information about the conversations with school personnel, and an in-depth interview with observers, teachers, school director and coordinator. The CRME was a major external agency that supported all school activities regarding innovation, education, classes, and Open Approach including the collection of instructional materials in the classroom. This resulted in research that demonstrates self-development practice to teacher as researcher in the context of Lesson Study and Open Approach.

Within this study, the conceptual framework provided by Inprasitha (2010; 2011) was mainly implemented by the participant. As shown below, he categorized the Open Approach into four steps:

1. Posing problem situation
2. Students self-learning through problem solving
3. Whole class discussion
4. Summary concepts by connecting students' ideas

Lesson Study (Inprasitha, 2006) is a principle of professional teacher development using school-based teachers as agents to improve classroom performance and collaborate with professional organizations for advice. The following steps are involved:

1. Collaborative Plan: members of the study lesson team share the teaching goal, write a lesson plan based on previous teaching experience, further consideration and correction including predictions of students' ideas that may arise, respond to situations, and problems.

2. Collaborative observation of research syllabus (Collaboratively Do): a member of the co-education team designs a research lesson to teach in the classroom. The remaining members observe together and record student concepts as they respond to problematic

situations. Teachers keep track of students' ideas, encourage and guide students to come up with the most diverse ideas without answering the students' questions, and waiting and giving students the opportunity to think to their full potential.

3. Collaboration reflects research results (Collaboratively See): the Lesson Study team will gather to talk about the students' ideas to achieve the purpose of teaching and what should be improved next time.

**Theoretical framework:**

The theoretical framework presented here is a conceptual framework that deals with research in the context of Lesson Study and Open Approach based on the concept of integration between teaching and research in mathematics classes as shown in Figure 1 below. The model shows the integration of teaching and learning using innovative classroom education with classroom research following three stages: The first stage is called creating a corporative lesson plan or defining a research problem. Within this first stage, teachers and research teams brainstorm together in determining the structure of the activities and how to complete the activities through integrating the researcher theoretical concept and the viewpoint of the teacher's actions. The second stage is teaching observation or data collection. This stage can be perceived as a qualitative data collection process since the teachers participating in the research will have the opportunity to record behaviour and the concept of student problem- solving activities. It is an important approach for the teachers to collect data and find solutions to problems in classroom research. In relation to the last stage, reflecting on teaching together or data analysis, reflecting on teaching is one of the processes of "Lesson Study" that can contribute to encourage teachers to participate in research, have a chance to exchange ideas, reflect on the results of every teaching activity, and get the advice of the researcher. This is an important basis for the integration of learning, teaching and classroom research.

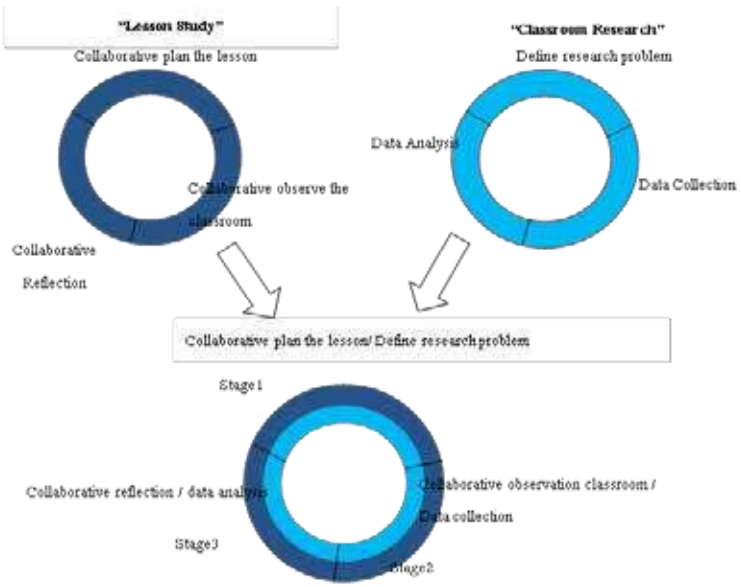


Figure 1.illustrates the conceptual framework for analyzing self-development of teacher as researcher in the context of Lesson Study and Open Approach (Inprasitha, 2010; 2011 and MaitreeInprasitha, 2006).

## Research instruments:

The tools utilized in data collection include, as following below

1. History and professional experience of the teacher prior to and after implementation of Lesson Study and Open Approach, example:

Figure2.Honorable Award (OBEC AWARD) at a national level in 2013 First place Award Gold medal for the best teacher in elementary school, mathematics in teaching innovation and technology field

2. Teaching Practice where the participant follows the hierarchy of Lesson Study and Open Approach in 2006-2015


Figure 3. shows weekly teaching activities of the teacher

3. Participation of the teacher and the team from 2006 to 2015 are illustrated by pictures and video showing activity involvement at school level, regional level and national level, example:


Figure 4. Teaching demonstration and reflection of teaching result at a national conference APEC 2008 (year 2551)

Figure 5. Foreign teacher group observed implementation of the Lesson Study and the Open Approach at Kookhampittayasan School

4. Teaching mathematic addition (2) includes 10 periods in 2015, involving learning management plan, interview protocol, classroom lesson photos, classroom lesson videos and teaching records, example:

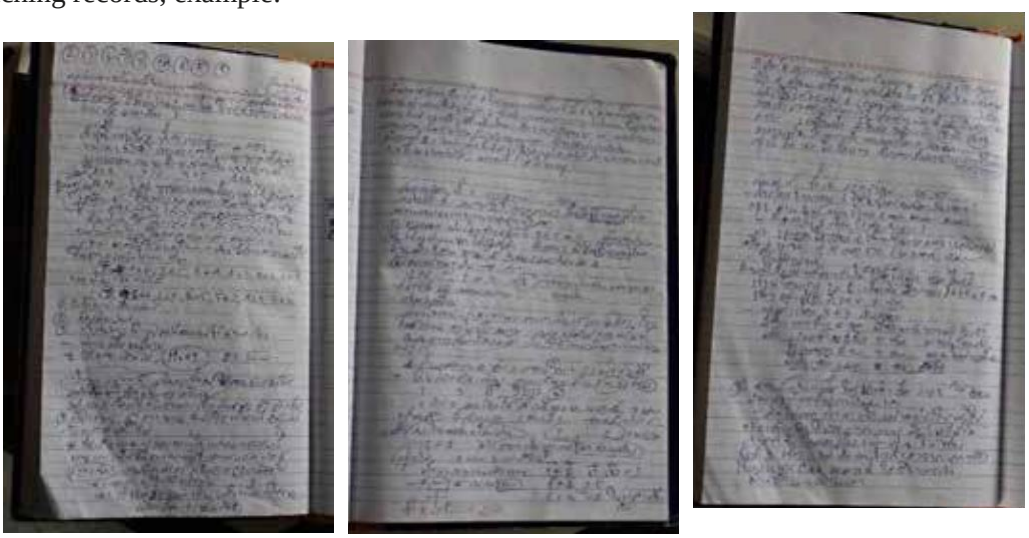

Figure 6.shows examples of teaching journal of the teacher

5. The interview protocol:part of speech of the school director from theinterview protocol “the teacher had high discipline as well as high virtue because she devoted all her efforts for students. There is disappointment and unhappiness when there is a conflict

with self-belief and learning theory. However, the goal is that students must receive some benefits".

## Findings and Discussion:

Triangulation analysis of empirical documents and evidence found complete consistency. Thus, self-development to become a teacher as researcher could be analyzed in the context of Lesson Study and Open Approach. The result of the research shows that the teacher developed herself to be a teacher as researcher by integrating these activities on a daily, weekly, yearly basis. The teacher undertook the following actions.

1. In the forming stage of lesson plan, the teacher has recognized the problem, allowing her to plan a better learning management to enhance teaching quality. She define research problems from her own classes by creating and improving the lesson plan with the Lesson Study team. The source of the research problem was to know each student and used the same concept that took place in previous years as basis for consideration. The research problem was formulated in order to observe the difficulties that occurred in the classroom by comparison, from the original taught-content idea in the previous year, and from predicting students' ideas to responding to problematic presentations.

2. In the implementation stage of the Open Approach in classroom, the teacher observed problem-solving skills of students and recorded their thoughts in her notebook. She also systematically collected working and activity documents of her students. The reflective journal had activity logs from the students' presentation which served as data storage and archiving tool. Then these information were used as data for reflection of teaching outcome by the teacher and the team.

3. In the Reflection stage of teaching outcome, the teacher and the team analyzed the events happening in a classroom, students' problem-solving abilities, and the usage of media as well as thoughts of students which could be used for further developments according to the observation. The study shows that data analysis is reliable. The result from the analysis will be used to improve learning management plan and a classroom study in the future.

The implementation of these 3 stages of Lesson Study and 4 steps of Open Approach is repetitive and continuous. It is a routine work. The result of the research could be presented by a diagram in figure 7 showing activities that the teacher performed daily, weekly and annually. These activities help the teacher to become a teacher as researcher.

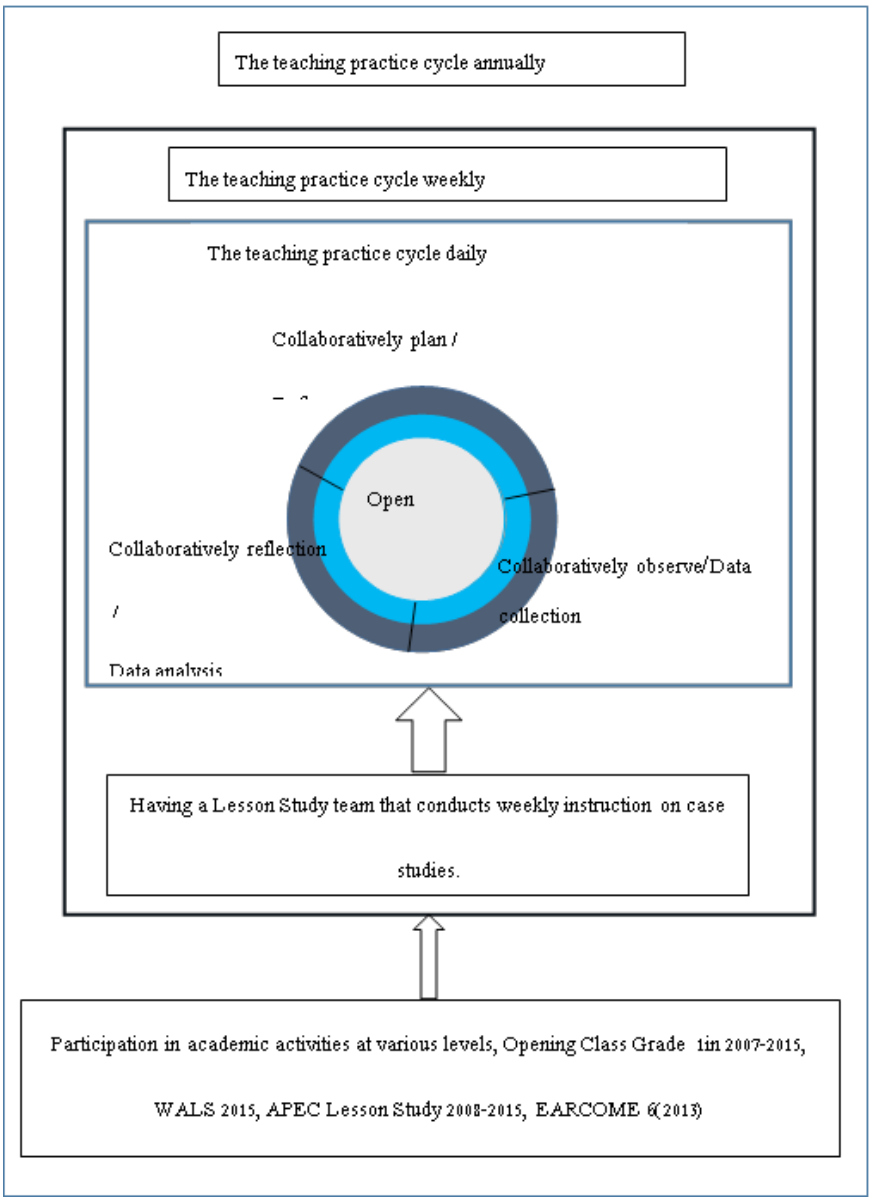


Figure 7. illustrates activities that case study done in daily, weekly and annually that develop herself to be teacher as researcher.

The research obtains the following result as the teacher participated regularly in activities at CRME, for example, the opening class of grade 1 invited specialists from home and foreign country to observe the school project study. She always demonstrates her teaching practice in her own class. Another important justification is that having a good working team, which included experts from the CRME, encouraged the participant to become a teacher as researcher. By implementing these, the participant was able to develop herself to be a teacher as researcher according to many scholars (Lewis, 2002; Lewis, Perry & Murata, (2006); Lewis, Perry, and Friedkin, 2009; Murata, 2011; Isoda and Katagiri, 2012) and in line with

Inprasitha (2006); noted that teacher who integrate Lesson Study and Open Approach in her routine work, she will become a teacher as researcher.

## Conclusion:

This research aims to present one aspect of developing teachers to become teacher as researcher by following steps of classroom study and implementing Open approach. As a result, the teacher will completely become a teacher as researcher. The research had objective to analyzes the development of a teacher as researcher in Lesson Study and Open Approach Context. The findings reveal 3 elements of Lesson Study and context of Open Approach that encouraged the teacher to develop herself as a researcher. The elements include: (1) Teaching under the context of Lesson Study and Open Approach that integrate classroom research; (2) Opening Class activities of Grade 1 of CRME, and attending international conferences. The conferences always included open class activity for all, including the studied participant. By attending the conferences, the participant in this study received useful suggestions from experts on how to develop her teaching practice; and (3) having a study lesson team consisting of the classroom teacher-observer. The teacher, together with the participant in this study had been working together since Grade 1. However, it should be noted that the Lesson Study team involving students taught in schools, school coordinator, school director, researchers from the CRME, and graduate students in Mathematics Education changed yearly. These individuals jointly designed a lesson plan, shared class observation, reflection, complete steps of Lesson Study and Open Approach guideline in teaching practice. The result of the development is that the teachers who followed the principles of Lesson Study and Open Approach developed themselves to a teacher as researcher. This was clearly evident in the studied participant for a teacher as researcher.

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