

Chapter 1

Introduction

1.1 Origin and Significance of the Problem

The policy on education reform in Thailand has focused on supporting and pushing forward for the changes in the form and process of the learning and new paradigm to be relevant to the Thai society to socialize the Thai youths to become good citizen, clever, perform the job well, maintaining their Thai citizenship, well adjust to the changing world and societal situations and have become the crucial resources for the survival and progress of the country in the midst of new social trend (Office of the Education Reform Commission, 2002:3). Consequently, the 2001 basic education curriculum has been designed to equip the students with the desirable characteristics of being good, clever, and happy citizen, having the knowledge along universal standard to keep up with the change and academic advancement suiting the situations and have the process skills particularly those on mathematics and science thinking skills, and enhancing their own intelligence and life skills (Office of the Basic Education Commission , 2001:39). There is a system that requires every learner to pass the evaluation on reading, analyzing, and writing along the criteria set by the school to be able to pass on to other grade level to complete the basic education curriculum. Later on, the Office of Basic Education Commission had improved and come up with the 2008 basic education core-curriculum and additionally focused on 5 competences to add onto the students, namely, 1) Communicative skill, 2) Thinking ability, 3) Problem solving capacity, 4) Ability to actualize life skills, and 5) Ability to use technology (Office of the Basic Education Commission, 2008:4).

In organizing the instruction along the core-curriculum of 2008 basic education, thinking ability has been regarded a significance competency to acquire to facilitate the learner's practice and systematic thinking leading to the construction of knowledge and making appropriate decision for their benefit and the society. This was relevant to the

education standard 4 that required the the students to be able to have analytical, synthetic, critical and creative thinking. It was found that for the whole country, this standard 4 had mean for only 2.88 (Office for National Education Standards and Quality Assessment, 2012:170). Thus the thinking skills of the students was then an important competence for them and most of them need to have them substantially developed.

Science was another subject being able to promote the learner's thinking skill as the subject science required the students to understand all the phenomena in the world through the use of inquiry learning process (Barab,2003:124-127). The students had to search for knowledge and put themselves into practice survey the body of knowledge through various approaches to the point of acquiring understanding and reasoning. Most instruction provision in science would stimulate the learner's doubts, curiosity, questioning, and trying to get the answer by themselves through the thinking process, planning, and practice. The teacher had to encourage the students to search for the knowledge on certain thing through the scientific process that focused on practice and experiment along the design learning process. The teacher would teach the students to learn to observe, question, survey, and collect the information to analyze or interpret the situation, present the findings, and discussing on them to acquire true and provable understanding on reasonable way (Niyomka, Suwat 1988, Good 1973, Sandra K.Abell, 2002, cited in the package on training the teachers for teaching physics for 3rd year students, Faculty of Science Chiang Mai University, 2009:2).

As an superintendent who had to supervise the instructional provision of the science teachers in the secondary schools affiliated with the Office of Educational Service Area 35 covering areas in 2 provinces, namely, Lampang and Lamphun, the researcher had found that most of the teachers had designed the instruction utilizing inquiry method through 5Es which included the engagement, exploration, explanation, elaboration, and evaluation. In each of the steps in implementing the plan in the real practice in the classroom, the teacher often suggested the method to find the answer for the students or guided or even disclosed the answers to the students rather than giving them the opportunity to design their own learning process and attempt to find the answer by themselves through actualizing the 4 steps of scientific process, namely, the first one was for identifying the problem, step 2 was to set up the hypothesis, step 3

testing the hypothesis, and step 4 concluding along the guideline provided by The Institute for the Promotion of Teaching Science and Technology (IPST). In opening the opportunity for the students to design the learning process and systematically put into practice along 4 steps of the scientific process by themselves would facilitate them the students in developing their thinking skills at every step. This principle was also suggested by Azmitia and Crowley (200: n.d.) who had concluded that the scientific thinking had to do with reasoning, experimenting, and testing the hypothesis as well the reliability of the information basing on empirical evidence to enable the students to have understanding on the lesson and stimulated them to be more interested in learning science leading the effectiveness of instructional provision on science. In every step of working along the scientific process, the students would be able to acquired scientific thinking skills. In step 1 , for example, the students would examine the basic information, analyze the situation, and identify the important issues. All these helped enhance thinking skills used for identifying the problem. In step 2, after the students had been able to clearly identified the problem, they had to compile the information and analyze and synthesize it to guess the answer to the problem – that is to be able to set up the hypothesis. At step 3 , after the students could set up the hypothesis, they would identify the variables and design the procedural steps to test it along the procedure set by themselves. At the final step, students would test the hypothesis along the procedural steps they had identified before using the information to analyze to find the meaning and relationship connecting cause to the effect leading the conclusion achieving the object set that had expected the students to acquire the thinking skills to interpret the information and make the conclusion.

The instructional provision to promote the scientific thinking of the students then would be the focusing point and had to be developed. The science teacher was the crucial variable for promoting the student's various skills as mentioned. It is then important to develop the science teachers to enable them to provide instruction that could promote the student's scientific thinking in an effective way.

The teaching profession development of most science teachers are often done in form of short-course training at the place such as university to where the teachers had to travel or to attend the training conducted by the resource person invited to the school.

Besides, there are some study tours to learn from the good practice carried out by the expert at their place which were the way to transmit knowledge from the resource persons to the teacher which could open up the perspective to paradigm of the teacher which might be effective at the beginning and occurred to many teachers at the same time but it could not assure its sustainability (Office of Basic Education Commission , 2011: 2). Thus there should be some teacher profession development to assure expertise, professional confidence, teacher profession development network, and the development basing on the needs of the teacher relevant to the context and needs of the school. The researchers had to have opportunity to observe and study the process which should be adopted to be used in the teaching profession development in the school to assure the sustainable teaching profession development. This process is known as the lesson study.

Lesson study had been initiated and developed in Japan. It is the long term professional learning model of the teachers. Wang (2006:6) stated that “Lesson study is the process in which teachers have cooperation concerning the instructional provision in the classroom aiming at enhancing the good learning experience of the students and improving the instruction of teachers themselves.” Besides, Ngamkanok, Sumet (2013:37) had explained the lesson study as the model of the instructional provision focusing on the thinking process that could sustainably develop and improve the instruction. Thus lesson study is the process for the teaching profession development widely accepted in Japan. In Thailand, lesson study was used for the first time with mathematics teachers in 2002 by Assistant Professor Dr. Mitree Inprasit, the Director of the Center of Mathematics Research, Kon Kaen University. The network for professional development had been set up and carried/ out the missions and later was accepted by the Basic Education Commission recognizing that lesson study could help develop the teacher’s instruction and enhance the quality of student’s classroom learning (Office of Basic Education Commission, 2011 : 4 -5)

From the conceptual framework of the teaching profession development as mentioned above, the researcher has become interested in studying the lesson study and had taken part in many seminars and workshops on lesson study at the regional, national, and international levels. The researcher also had opportunity in study-touring on the process of lesson study carried out in schools that participated in the teaching

profession development project using lesson study conducted by the Lampang Office of the Primary Education Service Area 1. The researcher had come to agree that lesson study was the process for the teacher profession development. It could be used to develop the teaching professional development of science teachers and could facilitate the science teachers to organize the instruction that could help the students in developing the scientific thinking skills to the peak of their capacity.

For all these reasons, the researcher, as a doctoral student studying in the curriculum and instruction program at the Faculty of Education, Chiang Mai University and has performed the missions as a superintendent to take care of the learning promotion on the science learning strand for secondary education level of the schools affiliated with the Office of Secondary Education Service Area 35 and had the responsibility in supervising organizing the activities to develop the teachers via variety of methods to comply to the standards set by the responsible Office. Regarding this, Chompookham, Weerasak (2 0 0 7) had stated that “ The superintendents had the functions to facilitate the teachers to enable them to improve and develop the learning activity organization in an effective way to achieve the goals set.” The statement had inspired the researcher to have the idea for the professional development for the science teachers to enable them to organize the instruction using lesson study which is the process relevant to the supervision on educational organization leading the professional development of the science teachers enabling them to provide the instruction that promote the scientific thinking skills of the students. This would lead further to the efficiency and effectiveness of the educational provision.

1.2 Research Questions

1. How to organize the instruction to promote the scientific thinking skills of the Mathayom Suksa 3 students?
2. How could the teaching profession development on instructional provision using lesson study affect the school administrator, teachers, and students1 ?
3. What do the school administrator and teachers think about the teaching profession development using lesson study?

1.3 Research Objectives

This research was to:

1. Developing the learning provision to promote scientific thinking skills of Mathasom Suksa 3 students.
2. Studying the roles of the school administrators, teachers, and students in the process of learning provision using lesson study.
3. Studying the opinions of the school administrators and teachers on the teaching profession development focusing on learning provision using lesson study.

1.4 Scopes of the Research

The scopes of this research are as follows:

Scope of the Target Group

The target group for this research included the individuals who had readiness and volunteered to take part in the research which included the administrators, teachers, and students of Jae Hom Wittaya School, Jae Hom District, Lampang Province. The participants of this research are as follows:

- 1) Two school administrators
 - 1.1 One school principal
 - 1.2 One vice principal
- 2) Four science teacher at Mathayom Suksa 1 - 3 composing of:
 - 2.1 One of each of Mathayom Suksa 1- 3 level science teachers totaling 3 teachers who collectively participated in the instructional planning, classroom observing, reflecting, and concluding the learning results
 - 2.2 One Mathayom Suksa 3 science the teacher who took part in organizing the instructional plans with the teachers in 2 .1 who was the one who implemented the instructional plans in the classroom as well as reflecting on them and concluding the learning results.
- 3) Forty-two Mathayom Suksa 3/9 students

Scope of Variables

In this research, the variables used in studying included:

Independent variables included the development of science teaching profession, the instructional organization to promote scientific thinking skills of

Mathayom Suksa 3 students using lesson study focusing on the method of learning organization carried out by science teachers who designed the instruction to promote scientific thinking of the students using standards/indicators on science strand of 2008 basic education core-curriculum using 4 steps of scientific process – problem identification, hypothesis setting, hypothesis testing, information interpreting, and result concluding.

Dependent variables included roles of school administrator, teachers, and students taking in operating the lesson study

1) Opinions of school administrator and teacher concerning the teaching profession development and learning organization using lesson study focusing on the research target group at the end of the process of science teaching professional development on the learning, on learning organization to promote scientific thinking skills of the Mathayom Suksa 3 students using lesson study.

2) Scientific thinking skills of Mathayom Suksa 3 students

Scope on Time

This research took 1 semester which was the 2nd semester of 2011 academic year

1.5 Operational Definition

1. Science teaching professional development on learning organization is referred to the activities to develop the science teachers organized by the researcher to build up mutual understanding on the instructional organization to promote scientific thinking skills of the students using lesson study along the 4 phases, namely, phase 1 – studying the context and conditions of science instructional provision, phase 2 - carrying out the workshop for the teachers on the instructional organization to promote scientific thinking of students, phase 3 – enhancing understanding on lesson study, and, phase 4 – operating on the development on learning organization to promote scientific thinking of students using lesson study.

2. Lesson Study is referred to the method of science teaching professional development on the instructional provision to promote scientific thinking of students in

which the administrator and teachers worked together along the 3 steps the lesson study process as follows:

Step 1 – Planning the instructional provision which was the process in which teachers worked together in analyzing the indicators of science subject learning and goals of developing scientific thinking skills of students and the teachers planned together to implement the plans to achieve the set goals.

Step 2 – Implementing the instructional plans and observing the classroom. This step was to put the lesson into practice in the classroom having one of the teachers carry out the instruction on the set plans while one and the concerned individuals came in to observe and collect information focusing on learning of the students, their participation, and other behaviors.

Step 3 - Reflecting and concluding the result of the instructional provision. This was the step in which the teacher and classroom observers exchanged ideas and worked together to analyze the information concerning learning behavior of the students and collectively concluded the results of the learning from the real classroom leading to the improvement of the instructional plans as well as the instructional methods.

3. Scientific thinking skills of students is referred to the thinking skills resulted from the students actually engaging in the learning activities along scientific process using inquiry teaching approach along 5Es composed of the following components:

1) Thinking on identifying problem is referred to the thinking to identify the problem. It was the thinking emerged from student examining the basic information, studying the situation, analyzing and selecting the important issues for identifying the clear problem.

2) Thinking on hypothesis setting is referred to the thinking emerged after students had identified the clear problem before collecting the facts concerning the problem and analyzing and synthesizing the information to guide how to anticipate the answer to the problem by selecting the ones which were clear with identified anticipation, identifying variables, and setting up the guideline feasible for testing the hypothesis.

3) Thinking on hypothesis testing is referred to the thinking emerged after the students had derived the clear hypothesis. There would be a design of methods and procedural steps to test the hypothesis and setting up the model for recording the result basing on the information acquired leading to the hypothesis testing process.

4) Thinking to interpret the information and concluding the results is referred to the thinking emerged after the students had acquired information from hypothesis testing by analyzing the obtained information to find the meaning and causal relationship leading the conclusion along the set objectives.

4. Role of school administrator is referred to the behavior, practice, or engagement of the activities by the school administrators concerning science teaching professional development on the instructional provision to promote scientific thinking using lesson study at steps 2 and 3.

5. Role of teacher is referred to the behavior, practice, or engagement of the activities concerning the lesson study at steps 2 and 3 focusing on the instructional planning, the implementation of the plans, classroom observation, reflection on the instruction, and the conclusion on the results.

6. Role of students is referred the behavior, practice, or engagement of the activities of the students during the actual learning provision carried out by the teacher.

7. Opinion of the school administrators and teachers referred to the opinion of the school administrators and teachers who were involved in the science teaching professional development on instructional provision to promote scientific thinking through the use of lesson study.

1.6 Expected Outcomes

1. Models of science teaching professional development using lesson study
2. Methods of learning provision to promote scientific thinking skills of the students
3. Change on the roles of the administrators and teachers in planning to organize the learning activities in the classroom as well as the their capacity in developing the learning process suiting the problem and context of the school.

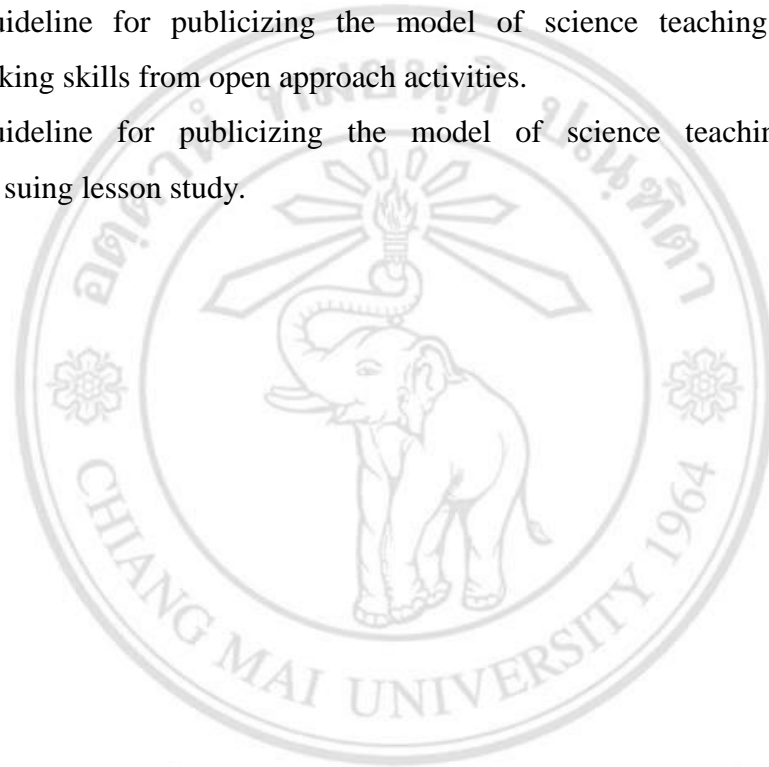
4. Collaborative network of the teachers in developing the instruction with collective reflection and the revision of the instructional plans to suit the real conditions in the classroom.

5. Students with scientific thinking skills along the clear system steps which they could use in other subject in appropriate way.

6. Guideline for the teaching professional development using lesson study for other subjects suiting the context of Jae Hom Wittaya School.

7. Guideline for publicizing the model of science teaching focusing on scientific thinking skills from open approach activities.

8. Guideline for publicizing the model of science teaching profession development using lesson study.



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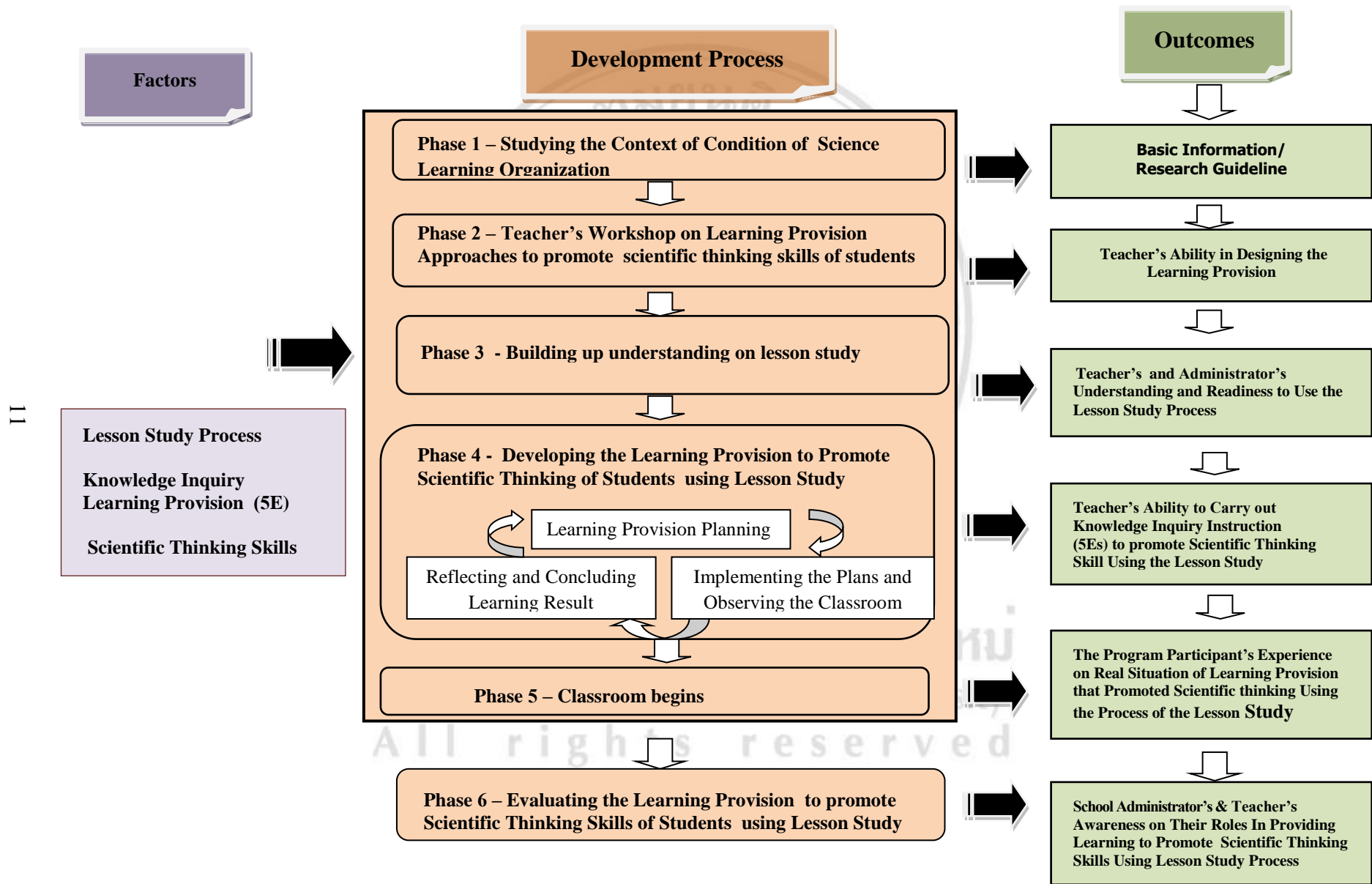


Chart 1.1 : Conceptual Framework