Teacher learning through Lesson Study: Lessons learnt from a School Improvement Program in an Indonesian Primary School

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Abstract
School vision, as a strategy used by the learning community, involves three learning agendas: student, teacher and school learning as a system. Within a learning community, there exist numerous dimensions; namely, relation, agency, content, problem and context. This paper discusses those dimensions based on deep analysis of “School Improvement Program: A Lesson Study Approach (SIP-LS)” conducted at Santa Ursula Primary School, Jakarta (January-May 2010). The program aimed to develop participating teachers’ capacities, i.e. teacher learning, through studying the nature of teaching and learning processes. In doing so, the program developed two main activities: 1) Leadership for Learning workshop that focused on exploring the nature of learning, teaching and the role of teacher in Lesson Study activity; and 2) Lesson Study workshop that involved a plan-do-see cycle for designing, implementing and reflecting upon teaching and learning activities. Data were collected through focus group discussion, field observation and document study. Interpretative study was then employed to identify key features (i.e. patterns of emerging relation, agency, norm and tool), lessons learnt and critical factors of teacher learning. Leadership for Learning workshop discussed the nature of relation among teacher, learner and subject matter in a classroom, and the role of participating teacher in professional learning community through Lesson Study approach. During the Lesson Study workshop, collaborative works (relation) based on particular roles (agencies) of participating teachers in scrutinizing how the learners learn (content and problem) underpinned the nature of teacher learning. Those features were developed by means of norms, such as focusing on how students learn and avoiding to negatively criticising teacher, and tools, such as a framework in predicting and observing students’ thinking and learning. By using the notion of practice based professional education (Ball & Cohen, 1999), lessons learnt are identified from analysis of teaching practice and community of practice that underlie the substantial framework of Lesson Study. In addition, the paper highlights cultural (vision of learning community), structural (distributed works) and conceptual (understanding of the nature of teacher learning) factors that determine the nature of learning environment of such learning community in the participating school. Further development and directions are moreover discussed as a starting point in enhancing and establishing a prototype of a primary teacher learning community in Indonesia.

Keywords: Lesson Study, teacher learning, lessons learnt, key factors.

A. Introduction

The work of teaching is a complex task that needs sophisticated knowledge and skill of teacher for which will have long term impact of the quality of student learning. In addition, the teaching profession itself is a dynamic one in which demands a continuous improvement of teacher expertise. Therefore, teaching does not merely constitute the notion of ‘to teach’ but indeed, it involves the notion of ‘to learn’ by the teacher. This shifting paradigm leads to the very nature of teaching as the learning profession (Darling-Hammond & Sykes, 1999): It appears that teachers need to expand and to improve their knowledge, skills and dispositions dealing with both teaching and learning. Therefore, providing effective professional learning of teacher is commendable.
Ball and Cohen (1999) argue that professional education should focus on studying the very aspect of practice. This notion approaches teacher learning by providing opportunity for teachers to scrutinize teaching and learning processes. In this case, the nature of teacher learning involves the content being studied that relates to what is taught, how to teach it and how to assess it (Bransford et al., 2000). In addition, in the context of practice based professional education, Ball and Cohen (1999) identify three important features: 1) the analysis of teaching practice; 2) the analysis of disequilibrium; and 3) community of practice.

One of approaches on the notion of practice based teacher learning that is recently growing in Indonesia is Lesson Study. Lesson Study is a teacher learning approach through the study of teaching and learning process conducted collaboratively by a group of teachers. This paper describes a teacher learning context of School Improvement Program: A Lesson Study Approach (SIP-LS) in an Indonesian primary school. The teacher learning context here covers the dimensions of relation (how is the relation among participating teachers), agency (the role of teachers involved), norms (common language) and tools of teacher learning.

SIP-LS was developed based on current development in teaching and learning literatures and in the area of Lesson Study development, particularly that of in Asian countries and specifically in Indonesian setting. As Stigler & Hiebert (1999) state that teaching is a cultural activity, so does the learning process of the teacher. Therefore, a professional learning approach should represents the notion of teaching and learning, of the teacher, as cultural activities that closely related to practical-daily work of teacher by means of: 1) school-based/work-based approach; 2) collaborative-collegiality form of relation; 3) focusing on the needs of student learning and how to provide learning situation for diverse learners; 4) analysing curriculum, and teaching and learning practices; and 5) long terms orientation (Darling-Hammond & Sykes, 1999; Loucks-Horsley et al., 1998).

This paper is started with the review of literatures pertaining to professional education/learning of teacher and Lesson Study, as well as its role in enhancing knowledge base of teaching. The discussion will then include the context of SIP LS activities conducted by Lesson Study team of the school by focusing on: 1) how the relation pattern and learning norms were developed; 2) the roles of Lesson Study team members; and 3) tools used in Lesson Study activities. The analysis towards these issues underlie the discussion on Lesson Study as a practice based teacher learning approach from which the substantial framework of Lesson Study is developed.

B. Teacher learning and Lesson Study

Darling-Hammond and Bransford (2005) argue that effective teachers understand the knowledge base of teaching. First is the knowledge of students and their development within the social context comprising the understanding on teaching and learning, as well as human and language development. The second one is the knowledge on subject matter and curriculum comprising the understanding of the educational objectives. The third one covers the knowledge of teaching pertaining to subject didactics/pedagogical content knowledge, how to teach diverse students, classroom management and assessment.

The understanding towards the knowledge base of teaching, as well as its complexity in nature, leads teacher professional education to equip teachers with *pedagogical thinking and decision making* (Kansanen, 2003). To reach that, the main thing to do is *linking* theory and practice; so that, in the future, teachers are able to solve problems of teaching, i.e the complexity of teaching and learning in practical situation. In terms of teacher education curriculum, Kansanen (1999) identifies three elements that may underlie the development of
**Pedagogical Thinking**, namely: 1) pedagogical theories – students’ development, and social as well as teaching and learning context; 2) pedagogical content knowledge/subject didactic – subject matter and curriculum; and 3) teaching practice – method, classroom management and assessment. The three components interact reciprocally so that they need organizing theme (Toom et al., 2008) or vision (Darling-Hammond & Bransford, 2005) which synchronizes them coherently and continuously as to build professional teachers.

The enrichment of knowledge base of teaching through professional teacher education in fact prepares teachers to be practitioners who need appropriate guidance in making pedagogical decisions based on rational arguments – besides intuitive practical matters. Some scholars (as of Kansanen, 1999; Darling-Hammond, 2006a; 2006b) identify two interrelated basic elements within the teaching profession: 1) reflective practitioners; and 2) action-researchers. Reflection is a way to get knowledge from what teachers have experienced within their class. Dialogue among colleague usually becomes the main media in reflection. It is within the reflection that teachers will find a certain matter requiring thoughts and further improvement. Within this process, teachers need knowledge and analytical skill, including the ability to read scientific journal and to write a report. The enrichment towards the two things can make teachers as a practitioner-researcher (Kansanen, 1999), or practitioner inquirer (Cochran-Smith & Lytle, 2004) who are able to make pedagogical decision.

The notion of organizing theme or vision in improving pedagogical thinking and the activity of reflection and inquiry in enhancing pedagogical decision making lead to the understanding towards the essential knowledge of powerful teacher learning environment. One powerful approach is to provide opportunity for teacher to scrutinize teaching and learning processes. In this case, teachers learn many aspects from practice settings. Researching the lesson, teacher studies the nature of learning and the complexity of teacher work and schooling.

Basically, the aim of professional education is not only focus on developing professional teacher, but also on developing adaptive experts (Darling-Hammond, 2006a). The adaptive criteria was directed not only by the quality of teaching routine (practical aspect), but also by the ability to have a pedagogical innovation and the understanding of how to improve professional matter. It impacts on how to capitalise teachers who are not only able to learn from teaching, but also to learn for teaching. The two learning criteria can be called as teacher learning in and around practice (learning teaching) as an entity of what Ball and Cohen (1999) call as practice-based theory of professional education. There are two main approaches that can be used, namely learning in practice (the act reflecting the practical situation) and learning from/around practice (analytical tools or pedagogy of investigation). Accordingly, the theory emphasizes teacher learning process through analysing situations similar to the real teaching setting.

The emphasis on the importance of practice-based teacher education is derived from the assumption that improving teaching and learning involves interaction of various aspects, unpredicted situation, and difficult to monitor and manage in nature (Ball & Cohen, 1999). This reflects the importance of a practice: that practice was dynamic in nature so that it cannot be learned at one time. Practice is learned and developed continuously and therefore cannot rely only on well considered body of knowledge.

Practically, teaching constitutes particularities in nature or so called unique and contextual. A particular classroom involves particular students involving with particular teachers in the context of particular lessons. It is, in fact, no general recipe in teaching practice; however, it is more to the ability of improvisation, conjecturing, experimenting as well as assessing teaching practice (Ball & Cohen, 1999). That is why that orientation of
practice-based teacher education more emphasizes the construction of an ability to adapt and develop teaching practice (teacher as adaptive expert).

Teaching through experiencing as a main point in practice-based teacher education is based on an assumption that knowledge is situated in practice, so that it should be learned in its real context (Feiman-Nemser & Remillard, 1995). Ball and Cohen (1999) identified several things relate to the situated learning from teacher learning in and from practice.

First, teachers learn teaching situation from moment to moment. For example, besides learning formal knowledge on children thinking pattern, teachers should learn about how to explore children knowledge and how to interpret that in each teaching sequence. Besides, teachers should learn how that meaningful learning can be planned and conducted. This process is known as inquiry into teaching in teaching which emphasizes study on how children in fact learn in a class.

Second, teachers need to learn how to apply knowledge and the study to improve how to teach better continuously. Every teacher has various experience, however, it does not have a great effect on the quality of teaching practice. That is why teachers require intellectual tools that can help them to understand what they know and be able to do. The tools would help them to test and explain some assumptions, thoughts, argumentations, and generalizations from experiences and knowledge about teaching and learning, including their beliefs.

Third, teachers should do experiments or develop new things in responding to students’ diverse learning or to unexpected classroom situation. Teachers should also know how to plan and revise task structure or how to question and lead discussion so that they can really understand their students thinking and understanding.

Those aspects of learning situation of teachers also become the main objective of Lesson Study practice which basically has a similar principle of investigation of practice or inquiry oriented in the context of practice-centered professional education as has been stated by Ball and Cohen (1999). Lesson Study was originally developed in Japan at the beginning of the 20th century and it was derived from the Japanese word jugyokenkyuu, which can also be translated as ‘researching lesson’, indicating the level of scrutiny applied to individual lessons (Lesson Study Team UPI, 2006).

The development of Lesson Study in Indonesia cannot be separated from what has been conducted by three faculties of mathematics and science education (FOMASE) in three leading teacher education institutions in Indonesia through a technical cooperation with Japan International Cooperation Agency (JICA) since 2000s (Suratno & Cock, 2009). In Indonesian context, Lesson Study is defined as a model of professional development for educators by studying teaching and learning activities collaboratively and continually, based on the principles of collegiality and mutual learning to develop a learning community among educators (Hendayana et al., 2006; Suratno & Cock, 2009). Accordingly, Lesson Study involves a group of educator in a Plan-Do-See cycle, that is, collaborative planning, implementation and observation, and reflection of teaching and learning processes.

The three stages of Lesson Study can be explained as follows. First, in the stage of Plan, Lesson Study team collaboratively develops teaching and learning design based on students’ needs and their learning demands. Second, in the stage of Do, an appointed teacher (called as model teacher) implements the planned lesson. This activity may be conducted in the form of open lesson where the other team members, including the principal, observe the lesson conducted in a classroom. The observation is mainly aimed at scrutinizing student learning in terms of interaction among students, between students and teachers, and students understanding of the content to be taught. Third, the reflection or
post-class discussion (See) is conducted soon after the open lesson. The appointed teacher model and observer discuss together, led by a moderator as to share evidence resulted from observation, to map identified learning problems and to find alternative solutions for the future lesson improvement (Hendayana, et al., 2006; Suratno & Cock, 2009; Suratno 2009a; 2009b). Through Lesson Study, therefore, teachers may be able to dig into and develop knowledge base of teaching, and teacher thinking and decision making underlying their professionalism and expertise. It is expected that such approach would engage participating teachers to explore lessons learnt and to articulate how to facilitate meaningful learning experiences for student to achieve.

C. The context of study

This study highlights a professional learning approach, so called Lesson Study, in which provides learning situation of teacher through researching teaching and learning from practice setting at St. Ursula Primary School in central Jakarta, Indonesia.

St Ursula Primary is a private catholic school. One of key feature of St. Ursula Primary School is the vision to become a critical, creative and innovative learning community. In this case, the notion of learning community involves not only the learning process of student, but also teacher learning and school learning as the system. This paper describes current effort implemented by the school in enacting its vision through a program called School Improvement Program: A Lesson Study Approach (SIP-LS). The program is started from January to June 2010.

SIP LS is aimed at building the framework of professional learning community at SD St Ursula (Suratno et al., 2010). Therefore, SIP-LS developed continuous workshops discussing the nature of professional learning of teacher. The first workshop was called Leadership for Learning that focused on exploring the nature of learning, teaching and the role of teacher in Lesson Study activity. The second one was Lesson Study workshops that involved a plan-do-see cycle for designing, implementing and reflecting upon teaching and learning activities. In general, SIP-LS workshops focused on facilitating participants to understand, develop, implement and analyse teaching from student learning situations.

As to explore the basic knowledge of teaching, SIP LS applies some views from Ball and Cohen (1999) pertaining to the efforts from teachers in mastering the teaching practice. First, teachers should master subject matter (conceptual aspect) and reasoning aspect of the content taught (habits of mind), not only procedural/superficial aspects as has been showed by most of teachers in many Lesson Study teams in Indonesia. Second, teachers should understand children whether in the terms of their background, thinking or reasoning, or their development. This kind of matter pertains to teachers’ knowledge in comprehending students’ reasoning on an idea/content, instead of insisting their reasoning to the students. Third, they should understand the context of meaningful learning as well as ask for others’ view on learning believed by teachers for years. For example, is there any student who looks ‘interested’ in the activities that experience the true learning process? Do quiet students learn or not? Is the content represented from concrete to abstract more helpful to students’ learning? Fourth, understanding pedagogy, namely connecting students to the content including how to create learning situation collaboratively to optimize their learning potentials, how to make teaching media/worksheet, whether students task helping them to learn, how to manage class and class/group discussion, and how to intervene students’ unanticipated responses.

Such an approach is basically at the heart of Lesson Study activities. In implementing SIP-LS, St Ursula Primary School appointed seven participating teachers as Lesson Study team. In the Plan stage, the team conducted several workshops aiming firstly, to identify teaching sequences and possible student learning trajectories based on both student needs
and learning styles, and the nature of content to be taught; secondly, to design and to develop teaching strategies (lesson plans, student worksheets, teaching materials, and assessment strategies); and thirdly, to try out developed teaching sequences and materials. During the Do stage, also called as open lesson, one teacher or model teacher conducted a planned lesson by applying the developed teaching strategies in the real classroom setting, while other team members observed the lesson. The focus of the observation was student activities, such as interaction of student-student, student-teacher and as well the interaction between the students and the teaching materials. Finally, in the See stage, the team met for post-class discussion to reflect upon the lesson. Observers framed the learning obstacles faced by student, gave comments and suggestion regarding alternative solutions and possible improvement for future lessons.

SIP-LS, therefore, was designed to facilitate teacher learning in which developed participating teachers the following capacities: 1) value student’s prior knowledge; 2) engage and scaffold student thinking; and 3) foster metacognitive attainment and other potential learning outcomes that characterize what so called as independent learner, i.e. creativity. Those capacities were viewed to provide foundation for developing the notion of learning as cultural activities in which: 1) school is viewed as learning site for both teacher and student; 2) professional learning of teacher is embedded into daily work; 3) emerging teacher roles from teacher learning activities. Those capacities and foundations were analysed in terms of : 1) the analysis of teaching practice; 2) the analysis of disequilibrium; and 3) community of practice (Ball & Cohen, 1999). These analyses would articulate key features of professional learning community at St Ursula Primary school vision.

Enacting that vision needs appropriate frameworks that represent many aspects such as social, cultural, conceptual and procedural as well. This paper describes the ‘what’s works’ in SIP-LS from earlier stage to current development by highlighting how the relation, norm and tool were developed and applied, and how those aspects influenced particular stage of development, i.e. teacher learning, within St Ursula Primary School learning community.

In so doing, the author documented (e.g. field notes, artefacts and pictures) and recorded (i.e. audio-video recording) SIP-LS activities. By using interpretative approach to some selected important situations, and applying discourse analysis to the recorded transcripts in particular, the author characterize the nature of those relation, norm and tool of teacher learning. In addition, from a deeper analysis, the author identifies key factors in terms of cultural, structural and conceptual aspects of SIP-LS implementation.

D. SIP-LS: A Brief

In general, SIP-LS designed three important activities which were continuously conducted, namely: 1) Leadership for Learning workshop; 2) Lesson Study cycles; and 3) School Forum. The three activities were developed based on understanding to the nature of school learning community as highlighted in the previous section. This section focuses on the first two activities.

1. Leadership for Learning workshop: developing relation and norm for teacher learning

This two days workshop that involved all teachers and principal focused on developing leadership aspects and powerful learning environment within school learning community. Particular attention given to develop the role of participating teachers in Lesson Study through the following activities:

- Reflecting upon teaching and learning activities experiencing by participating teachers and video analysis of teaching and learning processes that demanded participating
teachers to think about the nature of the right to learn and the authority of student learning. The discussion provided opportunity for participants to articulate the nature of student as independent learner, the notion of learning and learner centred within constructivist framework and the role of teacher in terms of devolution by facilitating and scaffolding student learning in meaningful ways.

- Discussing the nature of interaction in instructional processes: teaching-knowledge-learning. The triadugue underlies the knowledge base of teaching and has important roles in determining the pattern of teacher thinking and pedagogical decision making. Particular attention gave to develop teacher’s argumentation skill, i.e. pedagogical argument of teacher, which was derived from video analysis and reflection.

- Discussing the nature of teacher thinking at before, during and after the instructional processes. Frameworks for analysing those thinking processes were provided, namely prospective analysis (planning and designing the lesson), situative analysis (teaching and observing the lesson) and retrospective analysis (reflecting the lesson). In general, the focus of discussion derived to identification of what condition that foster student learning and what kind of learning obstacles faced by student. Those frameworks by which constitute teacher thinking and learning represent the very substantive aspects of Lesson Study.

- Discussing two key factors within school learning community, i.e. learning and leadership, that framed from the ideas of leading for learning. Knapp et al. (2003) identified three learning agendas in school: student learning, teacher learning and school learning as the system. The three learning situations demand strong leadership of educators in order to succeed. To contextualize such leadership into Lesson Study activities, the discussion identified several roles played by participating teacher, namely: 1) coordinator of the Lesson Study team; 2) moderator of Lesson Study activity/discussion; 3) model teacher, a teacher who is appointed to implemented the planned lesson; observers who observe the teaching and learning processes, and note taker who documents and takes field notes of activities. It was discussed that such roles represented agency in three general responsibilities: coordinating, collaborating and consolidating teaching and learning activities (see Table 1). These roles and responsibilities represent the agreed relation within the Lesson Study team.

Table 1. The role of Lesson Study team

<table>
<thead>
<tr>
<th>LS team coordinator</th>
<th>Roles and responsibilities</th>
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| Leading LS team in planning, implementing and evaluating LS activities. | • Coordination (action planning, monitoring, resourcing, reporting).  
• Collaboration (working closely with school leaders and collaborating resource person).  
• Consolidation (preparing and directing the learning process of teacher and student). |

<table>
<thead>
<tr>
<th>Model teacher</th>
<th>Roles and responsibilities</th>
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| Leading LS team to design lesson (Plan) and to scrutinize teaching and learning practice in his/her classroom. | • Coordination (leading lesson planning preparation, implementation and improvement).  
• Collaboration (structuring discussion of lesson planning and teaching preparation with other participating teachers).  
• Consolidating (organizing teaching preparation and other supporting things ready before open lesson implementation).  
• Modelling (providing case for teacher learning through  |
observing his/her classroom).

### Moderator

**Roles and responsibilities**

- Leading teacher discussion in each Do-See sessions of Lesson Study.
  - Coordination and collaboration (developing the focus of discussion and its guideline).
  - Consolidation (organizing teacher learning tool ready to use: forms, guideline)
  - Moderating the flow of talk and directing to analysing evidence, framing problems and formulating alternative solutions.

### Observer

**Roles and responsibilities**

- Collecting data and evidence to be discussed and reflected.
  - Applying observation guidance and rule during classroom observation.
  - Taking note and conveying findings in reflection session.
  - Taking active participation during discussion
  - Supporting other roles in coordination, collaboration and consolidation.

### Note taker

**Roles and responsibilities**

- Documenting the results of LS discussion.
  - Taking note of each discussion session.
  - Documenting all Lesson Study activities (notes, artefacts, etc.).

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To develop the context of teacher learning, it needs agreed norm. During the workshop, participating teachers discussed and articulated the followings that considered as initial agreement grounding the context of teacher learning through Lesson Study implementation (Suratno et al., 2010): 1) collegiality that value diverse experiences and expertise of participating teachers; 2) focusing on student learning and how to develop collaboratively an effective learning (avoiding to criticise teacher’s teaching); 3) vision of effective teacher and teaching; 4) individual and collective improvement; and 5) value ethics and polite behaviour during discussion.

### 2. Lesson Study cycles: developing and applying tool for teacher learning

During the program implementation, the team conducted two Lesson Study cycles in which consisted of once Plan and twice Do-See stage. The aim behind two times Do-See stages was to provide opportunity to revise the first lesson in order to have continuous improvement of the lesson. In order to have meaningful Lesson Study sessions, the team discussed the tool to be used that would enable participating teachers to understand the substantive aspects of Lesson Study, i.e. teacher thinking. The following sections highlight each implemented session by focusing on the tool used respectively.

#### a. Plan Stage

During Plan stage, the discussion focused on designing teaching sequences based on identification of student needs and learning styles, and the conceptual structure of content to be taught. In doing so, the team applied ‘Content Representation (CoRe)’ framework for analysing pedagogical content knowledge developed by Loughran et al. (2006) at Monash University and lesson designing form being used by Japanese teacher (see Table 2). Both tools were used to develop two important aspects: teaching sequences and student learning trajectories (Suratno et al., 2010).

<table>
<thead>
<tr>
<th>Teacher activity</th>
<th>Predicted student’s response</th>
<th>Form of activity</th>
<th>Remarks</th>
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Describe progression of teaching sequences from posing problem (exploration), main activities that facilitate action-reaction process (elaboration) and closing activities such as reflection (confirmation)

Identify at least two possible students’ responses, that is, expected understanding and alternative conception.

Describe possible intervention that integrate between individual and collaborative learning situation and provide scaffolding strategies.

Describe things related to teacher actions, teaching materials used such as worksheet or other teaching aids, possible learning obstacle, and others that clarify the context of teaching sequences.

In general, Plan stage focused on analysing teaching materials, problems to be solved, teaching aids, classroom management and assessment strategies. Analysis of teaching materials applied ‘CoRe’ framework by analysing conceptual proposition of the topic to be taught (big idea) and the broader context of teaching and learning (aim, reason, student need, etc.) (detailed discussion see Loughran et al, 2006). During problem formulation, the key issues were: 1) does the presented problem represent the proposition of big ideas; and 2) does the presented problem enable student learning to understand the topic? These issues lead to identification of possible student responses and ideas to anticipate those responses.

In the session that follows, the team developed and examined the teaching materials used such as student worksheet. This effort represented the way the team experiencing the materials as if they were a student: 1) Are the terms, languages, symbols and instructions easy to understand? 2) Is there any possible learning obstacles faced by student? Is there any possible alternative interpretation? Finally, the team developed tasks structure and questions to assess student learning.

In addition to developing teaching materials, the team also discussed classroom management such as sitting arrangement and blackboard management. Detailed discussion conducted by exploring possible anticipation/intervention based on predicted students’ responses. Through this approach, the team identified possible learning trajectories of student. At the end of the Plan stage, the team discussed the role of each participating teacher and formulated the focus of classroom observation and discussion guideline.

b. Do-See stage

Do-See stage consisted of three following activities: 1) briefing (pre-class discussion); 2) open lesson (classroom observation); and 3) debriefing (post-class discussion/reflection). Do-See sessions were lead by moderator who structured the flow of the talk. During briefing, usually moderator opened the session and explained the focus and guideline for classroom observation. Meanwhile, model teacher explained his/her teaching sequences and predicted student’ response, teaching materials used and the ultimate goal of the lesson.

During observation and reflection sessions, the team used the following guiding questions: 1) How does student response to the problems? 2) Is there any student who find difficulties in understanding problem and concept being taught? 3) Do worksheet, group discussion and other activities enable and engage student to learn? 4) Do planned prediction and anticipation emerge? Is there any change made by teacher and why? 5) Is the learning goal achieved? Does the lesson run effectively? Those guiding questions were developed to dig into broader context of teaching and learning practices which provided evidence for framing problems and formulating alternative solutions.
Initially, those questions were used to measure overall processes of teaching and learning but it perceived as too general. Therefore, current practices applied chronological observation by integrating those questions into each teaching sequence (Suratno et al., 2010). In addition to guiding questions, there were several underlying principles underpinned the development of teacher reflection guideline in which consisted of the following aspects: 1) developing teacher reflection mechanism; 2) framing problems by which used guiding questions for classroom observation and reflection; 3) emphasizing on factual observation analysis; 4) emphasizing on lessons learned and alternative solutions analysis from observed teaching and learning situation and problems.

Based on analysis to the content of reflection, the author summarizes following aspects that represent participating teacher’s view to Lesson Study implementation: 1) understanding student learning is of paramount important for teacher; 2) understanding the principle, substantive and procedural aspects of Lesson Study enables them to articulate the nature of learning both of teacher and student; 3) By developing and applying pattern of relation, norm and tool used would enhance teacher understanding to substantive aspects of Lesson Study fruitfully; 4) growing improvement in teacher knowledge, experience and belief about powerful teaching and learning.

E. Lessons learnt

The following lessons learnt were derived from the analysis of teaching practice; the analysis of disequilibrium; and community of practice of the discussion along the activities conducted at School Forum.

1. Learning in a professional learning community

Developing a sustained professional learning community is at the heart of Lesson Study cycle. Within a learning community there exists relation, norm and tool for studying teaching and learning activities (content of teacher learning) and analysing student needs and learning obstacles (problems being studied). Therefore, Lesson Study activities consciously consider the notion of learning within a learning community: what is learning, who is learning, and what kind of learning to be learnt? Discussion about ‘learning’ within a professional learning community drives to identification of teacher role in which embedded into teaching and learning processes: what is the vision about learning; who is leading for learning and what are leadership characteristics that support powerful learning situation? These issues are related to the notion of leading for professional learning community.

SIP-LS activities were designed to develop a professional learning community by which established mutual relation (collegiality and collaboration among agencies, i.e. various roles played by participating teachers) based on particular norm and tool being used to provide meaningful teacher learning situation (Suratno et al., 2010). For instance, in terms of norm, agreed rules about avoiding negatively criticism of teachers served as underlying guidance to provide a conducive learning environment. To create meaningful learning experiences, teacher learning needs clear problem and rich content to be learnt. In this case, focusing on how student learning -such as what is student thinking, what is learning obstacle faced by student- is the content and problem (that is, the subject matter of teacher learning) for which being studied by teacher. To understand the subject, the Lesson Study team applied pedagogical content knowledge framework, lesson designing form, observation guideline, interview protocol to explore student thinking and examining student work that served as tool for teacher learning. Thoroughly, those relation, norm, and tool enabled participating teachers to learn about teaching and learning from practice settings. Moreover, specific attention given to articulate the what, how and why the ultimate learning goals deserve to achieve: Does teacher provide engaging learning experience? Does student really learn?
Those key issues lead participating teachers to critically reflect upon conducted lessons. The author observes that the norm and tool used creating learning climate which foster critical reflection. Analysing student thinking as core content of teacher learning derives from observation about student learning demands and its obstacles in which provide convincing evidence in considering alternative solution to revise the lesson and to make self-internalized action of each participating teachers (Suratno et al., 2010).

In addition to providing powerful learning environment, SIP-LS was also designed to develop the role of participating teachers. As previously mentioned, in Lesson Study there were various agencies in which their roles represented as follows: coordinator, moderator, observer, model teacher and note taker. Each role contained leadership aspects which were structurally working in distributed ways: a combination of roles and responsibilities of each agency (Suratno et al., 2010). Such informal distribution of roles is shown as follow:

School Leader ★ LS coordinator ★ Moderator ★ Model Teacher ★ Observer ★ Note taker

The flow of such distributed tasks provides data and evidence about learning that underpins decision making process both by school leader (school policy) and teachers (pedagogical policy) (Suratno et al., 2010). For example, Lesson Study coordinator made policy for coordinating, collaborating and consolidating Lesson Study implementation such as providing appropriate resources (e.g. time scheduling) that needed support from school leaders. Another example is the role of model teacher that represented how pedagogical decision making works. This can be seen from the way model teacher lead his/her small team in preparing the lesson (e.g. lesson planning, teaching materials, classroom arrangement) and to provide modelling by implementing the lesson. Through observing teaching and learning activities conducted by model teacher, observers learned and collected data objectively in which framed learning problems and explored alternative solution to improve the lesson during See stage. Finally, the role of moderator represents Lesson Study coordinator and school leaders in leading teacher learning. The role of moderator is really important because he/she must organize the turn of talk and structure the flow of talk. In this case, the talk itself, i.e. discussion and reflection, is the key feature of teaching learning.

2. Lesson Study as practice based professional education of teacher

Considering the principles of Lesson Study, there were some aspects of learning in practice and from practice and aspects of professional discourse and engagement in communities of practice (Ball & Cohen, 1999). This is because that within Lesson Study, there are discussion, analysis, and reflection towards teaching practice observation: asking, investigating, analyzing, and improvement focusing on substantive aspects of teaching and learning as well as values within.

First was the analysis of learning in practice. Lesson Study offers an adequate context for teachers so that they could learn teaching in real situation, that is in real classroom. Besides, the implementation of Lesson Study involved citing and developing some important documents including: 1) lesson artifacts (lesson plan, worksheet); 2) students works; 3) field notes and minutes of discussion; and 4) video of Lesson Study. Those data was analyzed using intellectual tools, as what has been explained above, as the source of learning for teachers.

The second one was the analysis of disequilibrium through comparative perspective and critical incident. This was used to specify analysis in each of teaching sequence, by using some relevant intellectual tools. For example, the discussion of students’ learning process, in a certain steps, was deeply analyzed by using various data, observations, and students’ work, as to understand what learning was all about. The analysis may substantially found
whether students learn meaningfully in a certain learning situation (critical incident). For example, the analysis of the usefulness of worksheet: does worksheet help students’ learning process or not? The two aspects underlined the importance of the record of practice to change discourse of teacher discussion.

The third was the construct and analysis of the phenomena of community of practice. Considering this principle of Lesson Study, there exist now teacher learning community based on values of collegiality, collaboration and mutual learning. The structure and process can be seen from the continuity of participant in maintaining relation among them. Decent statement, as they get norms and relation, as to prepare and conduct agency became an important interest of Lesson Study community.

The analysis towards the three aspects of practice-based teacher education shows that there is a substantial element underlying Lesson Study as a promising approach of teacher professional education. Before discussing the substance framework of the cycle of Lesson Study, it is useful to discuss the needs of enhancing the three aspects, which is viewed from the aspects of professional socialization vs. isolation (Ball & Cohen, 1999), as it can lead the way to some recommendation on substantial framework of Lesson Study in the context of practice-based professional education.

First, the use of document of Lesson Study emphasizing the disequilibrium analysis was useful in changing teachers’ knowledge and belief. This context relates to the professional socialization process which keeps bequeathing practices that lack of comprehension on teaching and learning as had been conducted in analyzing students learning and the use of worksheet. Other examples were the emergence of the discourse on the importance of understanding students by analyzing prediction of students’ response as well as giving them a chance to explore their thoughts. This socialization phenomenon is getting clearer as the terms of prediction and anticipation, as well as exploration became the new terms in Lesson Study team.

The use of Lesson Study document through the use of relevant intellectual tool could change the knowledge and beliefs relate to the good teaching practice and narrow the gap between the theoretical and practical aspects. This is an important substantial improvement that emphasizes the finding of a conclusion that is probably rhetorical in nature. As has been mentioned above, teachers’ basic knowledge are complex in nature, so thus the basic improvement of teacher learning process relates to their understanding on the possibilities of alternative ideas, as well as their argumentative reasoning.

Second, Lesson Study can change the teachers' work which was used to be isolated. The underlying principles of Lesson Study, that is collegiality, collaborative and mutual learning underpins teacher learning as a social enterprise and a collective endeavor. In Lesson Study, teachers learn from one another to improve their capability continuously and thus broaden their opportunity to learn.

Lesson Study team, until this very moment had discussed substantial professional discourse such as described in socialization of key terms (e.g. prediction, anticipation, exploration). Stein et al (1994) defined it as ‘construction of more extensive common analytic and descriptive vocabularies and terms of reference, which would expand opportunities for more concrete and precise professional communication about practice’. Substantial professional discourse is important for teacher as to represent and clarify their understanding, to enrich notions and everything pertaining to the notions applicative as well as leading to the openness and the sense of contributing towards their professional development, either in development of teaching and learning quality and their roles as intellectuals.
The discussion on the two aspects shows the very beginning framework of Lesson Study. In the context of practice based teacher learning, Ball and Cohen (1999) identified two things that became the main framework. First was establishing Lesson Study in serving situating professional discussion in concrete tasks or artifacts. This attempt was aimed at constructing ‘a common analytic vocabulary and strong norms of analysis, professional conversation’ and avoiding it as ‘an exchange of buzzwords and slogans or rhetoric’. Second, building communities of practice having a shared understanding towards the study and analysis of teaching underlying the construct of ‘norms for knowledge and discourse within the profession’.

Professional learning orientation toward collaboration on professional study and analysis on teaching and learning could place professional development into the practice of teaching. It was aimed at fixing the practice (teaching) and practitioner (teacher) (Ball & Cohen, 1999). To emphasize the agenda, analysis towards the substantial aspects of Lesson Study, which was a prolongation of general principles and underlying processes of Lesson Study cycles, should be conducted.

3. Framework for professional learning of teacher community

In order to sustain teacher learning, it is not merely a need, but it should be fruitfully articulated in a meaningful ways. By using Loughran’s (2002) idea about teacher reflection, therefore, teachers should understand the context, the nature of the problem, and the anticipated value of such learning in all impact on what is learnt on and for what purpose (Loughran, 2002. Italic by author).

As learning approach for teacher, Lesson Study activities demand teacher thinking and reflection in all stages of Plan-Do-See cycles. This notion defines teacher thinking and reflection as the unity of activity of teacher from lesson planning to reflection session (the context). Overall, teachers think and reflect on how to develop pedagogical situation (the nature of the problem) that fits student learning demands for which promote student learning. From this notion the author proposes that there are three types of teacher learning (what is learnt) during Lesson Study implementation: 1) prospective analysis (Plan); 2) situative analysis (Do); and 3) retrospective analysis (See) (Table 3). These constitute the substantive aspect of teacher learning through Lesson Study activities (Suratno, 2009a; 2009b).

Table 3. Proposed frameworks for teacher learning practices through Lesson Study activities

<table>
<thead>
<tr>
<th>Prospective Analysis</th>
<th>Situational Analysis</th>
<th>Retrospective Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysing Learning Trajectory Design (LTD)</td>
<td>Analysing Actual Learning Trajectory (ALT)</td>
<td>Analysing LTD vs ALT</td>
</tr>
<tr>
<td>· Analyse possible learning demands and obstacles.</td>
<td>· Does prediction and anticipation appear? How is the process?</td>
<td>· Analyse student responses (student learning) and how teacher intervenes.</td>
</tr>
<tr>
<td>· Identify possible student responses (Prediction) and teacher intervention (Anticipation).</td>
<td>· Is there any new response beyond the prediction and how does teacher interfere? Does it work?</td>
<td>· Analyse learning obstacle and how to overcome it in vice versa?</td>
</tr>
<tr>
<td>· Develop Learning Trajectory Design (LTD).</td>
<td>· Do students experience learning obstacles? How to help them?</td>
<td>· Frame and reframe the analysed problem for alternative LTD.</td>
</tr>
</tbody>
</table>
Accordingly, the substance of lesson planning is *prospective analysis*, that is, analysis of prediction and anticipation to student learning demands. Prospective analysis will produce what we called, a Learning Trajectory Design (LTD). Prospective analysis, therefore, should be discussed during briefing session in order the observers understand the planned context of teaching and learning processes. On the other hand, *situational analysis* is applied during lesson implementation in which observers are able to compare between designed (LTD) and Actual Learning Trajectory (ALT) to understand the nature of pedagogical (teacher-student interaction) and didactical (student-subject matter) situation. During this open lesson session, model teacher thinks, acts and reflects directly to the situation, whereas observers think and reflect as if they are teaching in that situation. Finally, *retrospective analysis* is applied during reflection session in which emphasizes on the nature of inter-relation between teacher’s teaching and students’ learning (teacher’s perspective vs. students’ perspective), analysed the designed and actual learning trajectory and possible alternative of LTD for future lessons.

The framework views teacher thinking as a holistic process. Through this framework it is expected that teacher attains a fruitful understanding, articulation, ability to frame and reframe problem from Lesson Study practice. Furthermore, it believes that framework can promote the exploration of teacher tacit knowledge to explicit knowledge that enriches the knowledge base of teaching, artefacts or even the wisdom in practice (i.e. *purpose and value* of teacher learning).

F. Key Factors

The following three valuable lessons cannot be separated from many factors especially those pertain to school context and the development of the implementation of a program. Based on the analysis towards discussion with participants and reflection towards what they perceived, the author identifies, at least, three important factors.

1. Cultural factor

In terms of cultural factor, initial capacities of participating teachers and school leaders showed that basically they had sufficient knowledge, experience and skill pertaining to teaching, professional learning and school works. School vision which aims to develop learning community has created positive attitude such as openness and adaptability to change. In this case, the principal leadership played key roles in encouraging teachers to learn and providing opportunity for teachers to actualize their roles in various tasks. In short, school leaders challenged the teachers to learn new things. In addition, the culture of collaboration within Lesson Study team has been formed from teachers’ daily works; they are used to work together.

Thoroughly, it can be viewed that teachers and school leaders at St Ursula Primary School are relatively a well educated educators. This is important cultural capital that determines particular level of commitment, active participation and good practices within professional learning community to achieve. Even more, SIP-LS arises participating teachers’ awareness of improving learning community and of articulating further school vision into action.

2. Structural factor

Establishing small team with clear distributed works of mutual relation (collegiality and collaboration) that share roles and responsibilities is key feature of structural factor. The structure of the team that consists of coordinator, moderator, model teacher, observer and
note taker drives participants to be more committed to do three critical tasks: coordination, collaboration and consolidation. This distributed nature of works structure the flow of information regarding to resources allocation, such as time and materials that support teaching and learning, and other supportive policies from school to Lesson Study team.

Basically, the Lesson Study team does not embed into formal structure of school organization. The team is informally formed but can do the task smoothly within formal school organization. Such work represents the informal nature of distributed leadership played by each agency within the team.

3. Conceptual Factor

Participation in SIP-LS provides participating teachers experiences that reflect the development of conceptual understanding of teacher learning held by participants. There are several aspects of participants’ understanding: 1) of underlying principles, procedural and substantial aspects of Lesson Study as teacher learning approach; 2) of the nature of student learning and thinking; 3) of the nature of teaching and learning from lesson planning to evaluation; and 4) of their roles and responsibilities in Lesson Study activities. Those represent participants’ understanding of the content and the problem of teacher learning.

Moreover, the patterns of relation, agreed norm and tool used enable participating teachers in understanding the nature of teaching and learning process and how to improve it. There is growing awareness that researching teaching through analysing student learning could enhance the learning practices and leadership roles of teacher, and school as well.

G. Future Directions

Overall the paper discusses initial effort in establishing professional learning community by means of developing relation, norm and tool for teacher learning at St Ursula Primary School. In addition, frameworks for studying the context, content, problem of teacher learning are also described. The author argues that developing such aspects is critical in initiating the development of professional learning community to be empowered.

What follows from that initial stage of development is to develop other aspects related to two important issues: dissemination and sustainability. The author would argue that, in addition to develop further teacher learning capacities, current development at that school represents a prototype of professional learning community of primary school. Therefore, it needs strategy to develop relation, norm and tool to disseminate such kind of professional learning practices. Similar effort needed to develop monitoring and evaluation mechanism in order to sustain professional learning culture progressively.

Finally, in terms of leading the teacher as learner, the development of school leader capacities in learning and leading teacher learning, i.e. system learning is urgent. It is argued that school leaders will make more difference to further enhance the capacity of teacher learning that constitutes a powerful professional learning community at school.

References


