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Localizing Lesson Study for the Math Teachers' Professional Development, Necessities and Prohibitions

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ABSTRACT

The century in which we live, Elvin Toffler declares, called 'the Wisdom Century'. Therefore the education of the 21st century should foster thoughtful and disputatious people, who are able to discuss, criticize, and make decision, process information, choose, and be responsible persons as well. Thus, the role of teachers as the main training agent, in achieving this goal, is so significant and noticeable, for teachers with no skill and professional expertise are not deserved to train pupils properly. Recently, lesson study which its headquarter is Japan, as a strong tool to math teachers' professional development, attracts so much attention to itself, and researches through exact studying of that, represented local models matching economic, social, and cultural conditions of their countries. In this paper, we represented different lesson study models after considering and giving exact description of Japan math lesson study, and eventually considering lesson study local problems and representing some proposes to localize the model will be the epilogue of this paper.

KEYWORDS: Lesson Study, Teacher's Professional Development, Teaching Feedback, Group Cooperation Culture (Approach)

1 INTRODUCTION

Gained results from analyzing math classes recorded film in Germany, Japan, and America TIMSS (Third International Math and Science Study) reveal Japanese students success secret in the international exams like FIMSS (First International Math and Science Study, 1964) and SIMSS (Second International Math and Science Study, 1980). Paying attention to Japan consistent high ranks in such international researches causes some accurate consideration, and at last to recognize lesson study as Japan success main factor in teaching math. The Japanese word 'Jugyou Kenkuu' translated for the first time as 'lesson study' by Yoshida (1999). Lesson study literature precedes the 20th century. Isoda (2000) states:" By using lesson study, teachers improve their teaching styles. In the early years of NiGi sovereign, around the year 1870, such lesson study which includes observing each other's teaching, was introduced to Japanese teachers of elementary level Tessoya University and it made them familiar with lecturing teaching method. Since in passed periods, tutoring was the only teaching method, Japanese governors attempted to introduce new teaching methods as early as possible. Such strives, after more than 100 years, resulted in a Japanese method to lesson research and applying new curriculum, as well professional development. In fact, Japanese teachers are expected to be a teaching researcher rather than a common teacher (Ayoubian, 2006).

According to Stigler and Hebert (1999) in *The Teaching Gap*, lesson study logic is so simple, if you are to improve teaching, then select class. If you begin with lessons, the problem of how applying the research results in class disappears. Improving in class is the most important point, and then recognizing all the types of changes which make students learning improve. After such recognition, it's time to cooperate the knowledge with other teachers, those who encounter similar difficulties, or possess common aims in class.

Lesson Study Features and Procedures

Fernandez and Yoshida (2004) summarized a lesson study procedure in 8 phases:

1.1 Cooperating in addressing and raising the problem: Generally, lesson study is a solving procedure. Therefore, the first step is to raise a problem which leads lesson study group activity. The problem can be a general question (e.g. stimulating students' interest in math) or a detailed one (e.g. improving students' understanding of how to sum up (count up) fractions with unequal denominators), then

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the problem gets a determined form so that can be raised in class. Teachers generally choose an achieved problem from their own activities, or one which poses a challenge to the students.

1.2 Planning: After choosing a learning aim, teachers hold a meeting to plan and compile the lesson scheme. Although a teacher teaches the lesson finally, the lesson itself is a cooperative product. Here, the end is not just to produce an effective lesson, but to figure out the teaching method in order to increase students learning. Frequently, the primary produced plan by the group represented in a meeting for all the teachers to be criticized and provided some feedback. Based on such feedback, the revised edition executed. It's worth mentioning that the primary planning procedure may take months.

1.3 Teaching the schematic lesson by teacher: The schematic lesson taught by one of the teachers at a definite time. Through teaching the other teachers sit in the back of the class and watch the teaching method. While students are doing activities, they walk and watch them, and as teaching continues, they take notes from the activities, misunderstandings, and solving problems. Sometimes the teaching procedure recorded on film to be analyzed later.

1.4 Evaluating the taught lesson and feedback: After teaching, the group holds a meeting to consider and critique the lesson (it's worth mentioning that evaluation focus is upon the target lesson, not the teacher). In this meeting, the teacher makes a speech about the teaching and its features, and then the group expresses opinion about the teaching challenges and the weak parts. It's worth mentioning that such critiques are perfectly useful and address all the members, for the taught lesson is a group product, not just an individual one. Such critiques cause improvement of later lessons scheming procedure, as well increase the group self-improvement ability.

1.5 **Revising and editing the taught lesson:** The group revises the lesson according to observations and feedbacks.They may change teaching materials, activities, questions, and raised problems or all of these matters. They often emphasize on issues of which essentiality proved in class.

1.6 Re-teaching the revised lesson: After editing the taught lesson by the group, its revised version will be provided for re-teaching in another class and by another teacher of the group. It's interesting to know that the number of invited teachers is greater than the students!

1.7 Re-evaluating: After re-teaching the lesson, all of the invited teachers and the lesson study group members consider and critique the teaching procedure in a long lasting meeting. Frequently, an expert from other teaching institutions or other schools is invited to the meeting. In discussing the lesson, all the general problems represented through lesson study main principles are important, not just students learning and understanding, eventually they discuss whatever learned from the lesson and teaching.

1.8 Compiling and sharing the final lesson study report: At last, a comprehensive summary of all the meetings, discussions, and teaching framework will be compiled and put in the school library, called lesson study booklet, to be used by other school teachers, and as well by future amateur teachers of the school. Teachers share in the gained results differently:

- Writing report and lesson study booklets: teachers ' booklets will be sold in Japan bookshops, and school teachers not only can use their own school lesson study resume, but also can exploit other schools experiences. Reports show that teachers publish reports even more than researchers.
- External aware supervisors: external aware supervisors, who are present in school teams, exchange such experiences with other schools.
- Open house: in some Japanese schools hold meetings called 'open house' in which the group request from the invited school teachers to observe their school lesson study results. Finally, a teaching conference will be organized to critique the executing teaching. It's worth mentioning that any teacher in Japan will remain at a determined school for at most 10 years, and teachers frequently change levels to which they teach, thus their information and experiences continuously change and improve.

Reviewing different lesson study models: Although lesson study research history in several countries except Japan is about 2 decades, a great number of researches have been done. During this short period, countries have planned local models in line with their own conditions, and been very active in executing the Japanese lesson study model. Some models are introduced in the following pages. Even though such models are separate, they cover each other so well, and their common aim is to increase teaching quality and teacher professional improvement. Some lesson study models are as follows:

Fernandez et el (2001), Yoshida (1999), Takahashi (2001), Fernandez-Yoshida (2004), Richardson (2004), Lewis et el (2005), Tenyami et el (2004), Ayoubian (2006), Ektefaei and Fadaei (2006), and Khakbaz

(2007). Maybe Richardson model of which teaching and learning procedure represented in the following 7 steps is more perfect than others (Ayoubian, 2006):

1. Forming a lesson study group
2. Focusing on lesson study
3. Planning and scheming the lesson to teach
4. Being prepared to observe
5. Teaching and observing
6. Getting information from the teaching
7. Feedback and planning for the following steps

Another interesting model to introduce is Takahash model (2001) which you can observe its cycle in Figure 1. Novel thoughts and new ideas determine the main identity of the model. The model principle output is novel creative ideas which are able to solve students' new learning problems (Takahashi,2005; Khakbaz, 2007; Ayoubian, 2006; Takahashi and Yoshida, 2004).

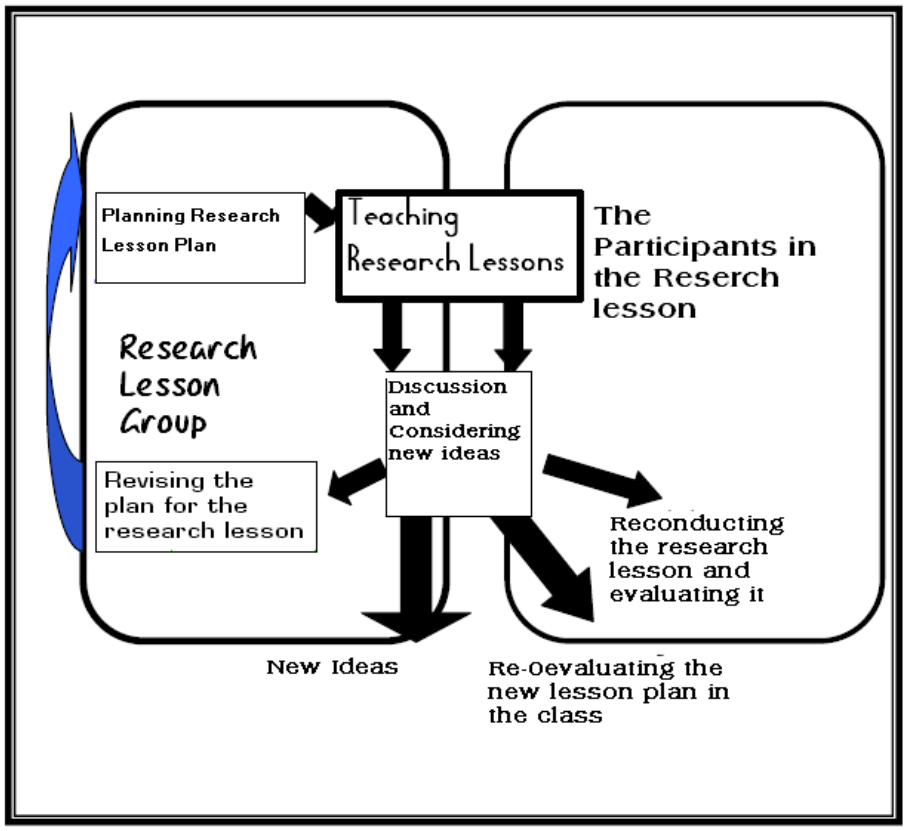

Figure 1: Lesson study model from Takahashi's viewpoint (Khakbaz, 2007)

The word 'researching lesson' in Figure 1 means the group prepared lesson to teach. Ektefaei Nejad and Fadaei (2006) planned a local model in 4 stages:

Stage 1: planning sessions
Stage 2: group sessions to compile and revise the lesson
Stage 3: teaching the lesson in class
Stage 4: feedback and revising the executed lesson, as well representing the results

The represented local model by Ayoubian in 12 phases is to be executed in Teacher Training Centers (TTC):

1. Researching centers and teachers deciding
2. Selecting the study team, hiring new members, and arranging the schedule
3. Determining slight aims
4. Scheming the plan
5. Being prepared to observe

6. Executing the study
7. Feedback on learners believes and new needs
8. Feedback on teaching
9. Deciding about the teaching repetition
10. Teaching the revised lesson
11. Feedback on the changed teaching
12. Concluding and compiling the lesson study booklet

This model difference is the 7th step in which the emphasis is on knowing whether the study covers students weak points or not. The following is Yoshida-Fernandez model (2004) which includes 6 main phases:

- Lesson study planning
- Observing the lesson teaching
- Discussing the taught lesson
- Revising the taught lesson
- Teaching the revised lesson
- Discussing the revised teaching

Khakbaz (2007) used Yoshida-Fernandez lesson study model (2004) to math teachers' professional develop in the reign 2 of Kerman, and got interesting results. Although he was not going to scheme a local model for lesson study phases, represented one. See Figure 2.

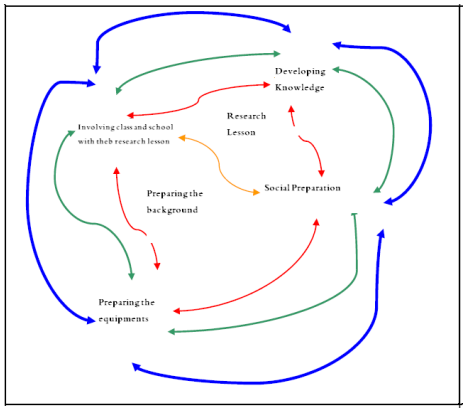

Figure 2: math teachers' professional development model based on Yoshida-Fernandez cyclic lesson study

2: CONCLUSION AND DISCUSSION

In this paper, lesson study literature, lesson study different models, as well their differences and similarities have been discussed, however, the most important issue is to recognize whether we can scheme an accurate local model in accordance with social, cultural, economic, and political conditions of Iran provinces or not. As mentioned previously, there are so many lesson study models which cover each other, therefore planning a lesson study model will not be difficult; the main point is to discover the essential conditions for scheming practicable local models. The most major problem in executing lesson study in Iran is the lack of strong cooperative culture, simplification and lucidity, as well teachers and headmasters negative reaction to critique. The stress resulted from critique causes teachers disinterest in cooperative executing the lesson study method. Despite lesson study apparent simple phases, Richardson claims, it's so dependent upon the cooperative culture, therefore makes some difficulties in successful execution. Lesson study chance success is various among different countries. Lesson study model will be more successful in a culture that teachers can express teaching problems easily and with no stress than a culture in which teachers feel any need for expressing teaching problems and consider this issue as teachers' weakness. A good solution to increase cooperative culture and the ability of accepting criticism among teachers and headmasters is to make them familiar with the lesson study philosophy, for lesson study is a group job and the lesson is a common product, as well. The group critiques their own tasks, not just one member, and the

only aim is to improve the next lessons compiling procedure, individual development, and students' conceptual learning.

Lewis (2002) states that we cannot copy lesson study from Japan different teaching system, but adjust it to our culture and education system, even we can encourage some innovations. In *The Teaching Gap,* Stingler and Hebert (1999) claim that teaching is a cultural system. One society culture is a set of customs, rituals, and believes which has formed gradually and by the pass of time, therefore cultural changes are gradual and slow. Lesson study is a complex and time- consuming procedure with gradual results, thus it's not rational to expect early and significance results while executing a local lesson study model.

Another big problem in successful executing the local lesson study model is lack of teachers and researchers who are familiar with the lesson study procedure, challenges, and method. It's interesting to know that the number of experts in this field is so small! The solution of this problem is to invite expert teams and supervisors from other countries, especially Japan, thus they can hold teaching workshops and train local lesson study teams to improve the local knowledge of lesson study and solve the problems in executing the lesson study method (the best place for forming and teaching the lesson study teams are Teacher Training Centers). As mentioned, lesson study is a time-consuming activity and teachers' main time activity is after school and after doing routines, therefore one of the main principles of taking part in this common activity is to be relaxed, at least in the case of life. Improving teachers living situation cause them to be relaxed and more interested in forming lesson study teams, but

Whatever the situation is, the best efforts should be made to make it better.

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