

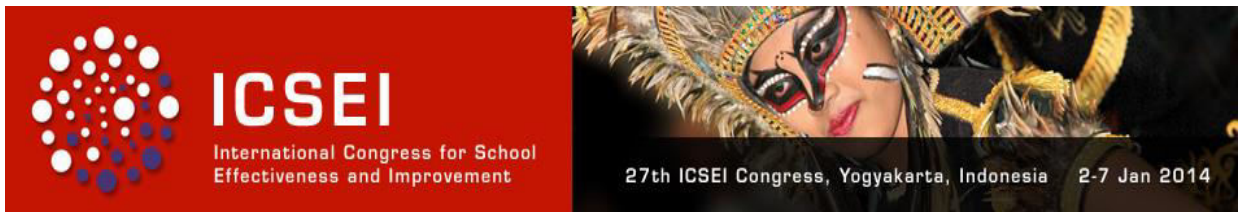
## **THE TEACHER PROFESSIONAL DEVELOPMENT THROUGH LESSON STUDY IN INDONESIA: A SUCCESS STORY FROM YOGYAKARTA**

Marsigit, Suyanta, Y. Sumardi, Nur Kadarisman, Ali Mahmudi, and I Made Sukarna  
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### **ABSTRACT**

Under cooperation between Government of Indonesia (GOI) and JICA-Japan, three universities UPI Bandung, UNY Yogyakarta and UM Malang carried out project called IMSTEP-JICA for pursuing good practice of mathematics (and sciences) teaching by empowering and developing teacher education. Starting in 1999 and lasting in 2005, the extending of the project resulting piloting activities through Lesson Studies for good practice of secondary mathematics teaching in three cluster site West Java, Central Java and East Java. Results of the studies significantly indicated that there are improvements of the practice of secondary mathematics teaching learning processes in term of teaching methodology, teacher competencies, students achievements, alternative evaluation, teaching learning resources and syllabus. The following Lesson Study activities were conducted under the schema of SISTTEM, stand for Strengthening In-Service Teacher Training of Mathematics and Science Education at Junior Secondary Level, was born from the cooperation between JICA and MONE of Indonesia. The overall goal of SISTTEM is to develop the model of in-service teacher training primarily through MGMP activities applying Lesson Study; to continue teacher professional development in the target province: Kabupaten Sumedang (in West Java), Kabupaten Pasuruan (in East Java), and Kabupaten Bantul (in DI Yogyakarta). The significant roles of lesson study activities proved to be immerse following the big Earthquake in Bantul, 2006. The Lesson Study activities was proven to be effective in lifting students' enthusiasm in learning science, helping students to develop their experimental and discussion skill, and in giving opportunities to students in developing their own scientific concept by themselves. It was also reported that by using constructivism approach, the students may find out their best style of learning. Competition rises among groups of students in presenting the results of their work and in defending their presentations. This forces students to learn more theory more for their own sake. As a result of Lesson Study activities there were many teaching material developed either by lecturers or by teachers. Those materials were either developed by lecturers or teachers in their own classroom or by lecturers and teachers altogether during Lesson Study activities. In general, lecturers and/or teachers developed the teaching materials after thinking extensively what and how to develop teaching materials for a certain topic, and then develop the materials. Further, they tried out the teaching materials in their classroom and revised those based on the result of the try out.

Key Words: lesson study, disaster area, school quality, recovering and improvement



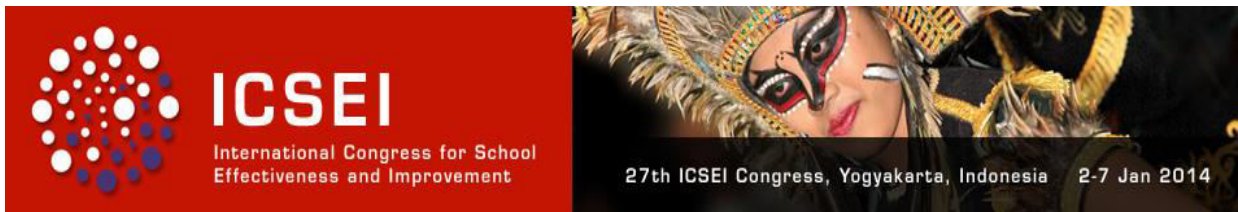
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### **A. INTRODUCTION**

The implementation of the lesson study as a cyclic procedural strategy for improving mathematics and science teaching began in the piloting project of the pre-lesson study, under the cooperation between GOI and JICA, involving three education universities located in three different areas of Java Island: Education University of Indonesia, Yogyakarta State University and Malang State University. This project, which was called IMSTEP (*Indonesia Mathematics and Science Teacher Education Project*) and lasted from 1998-2001, involved a number of partner schools, with which the three universities collaborated with the schools in their respective areas to obtain empirical evidence of the lesson study effectiveness in improving the teaching of mathematics and sciences, both in the inservice and preservice teacher education. The success of this project led to the extension of IMSTEP, or the Follow-up IMSTEP (2001-2005). Again this project showed various improvements in the teaching of mathematics and sciences. Such a success has led to another project, which was called SISTTEM (Strengthening In-service Teacher Training of Mathematics and Science Education at Junior Secondary Level) (2006-2008), focused on the improvement of teacher training for junior secondary schools in the same three areas as mentioned above by reorganizing and revitalizing MGMP (Subject Teachers Organization). This project targeted 284 high/secondary schools (both Junior and Senior High Schools or *Sekolah Menengah Pertama/Sekolah Menengah Atas*). (Anita, Krisnawati, 2010)

This presentation will be focused on the implementation of SISTTEMS in Yogyakarta where this Lesson Study development project has indicated a great success, beginning with teachers of mathematics and sciences, then extending to teachers of other subject subject matters. Findings of the research study conducted in 2013 on the impact of the Lesson Study development project will also be presented (Marsigit, 2000).



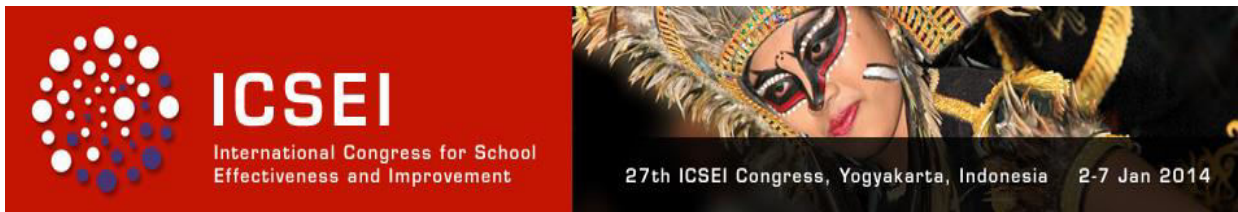
## B. THE LESSON STUDY PILOTING PROJECT

Believing in the key role teachers play in education, the government of Indonesia (GOI hereinafter) has indicated its commitment to their professional development through a pre-lesson study project entitled IMSTEP (*Indonesia Mathematics and Science Teacher Education Project*). Lesson study is a cycle of professional development focused on teachers planning, observing, and revising “research lessons”. This project, which was funded cooperatively by GOI and JICA (*Japan International Cooperation Agency*), started in 1998 in which three education universities (Universitas Pendidikan Indonesia or UPI in Bandung, Universitas Negeri Yogyakarta or UNY in Yogyakarta, and Universitas Negeri Malang or UM in Malang) were involved. This project was aimed at improving the quality of Mathematics and Science education in Indonesia through an integrated program of pre-service and in-service teacher education so that the impact would be on instructional improvement at schools (Herawati S., 2003).

In fact this project promoted a new paradigm of mathematics and science education. The recommended changes are summarized in Table 1 below.

**Table 1: The Paradigmatic Changes Promoted in the IMSTEP Project**

Old Paradigm	Recommended Pradigm
Education as investment	Education as a need
Learning as an obligation	Learning as a need
Short-term orientation	Long-term orientation
Competiton	Cooperation
Instrumental curriculum	Interactive curriulum
Teachers as curriculum implementers	Teachers as curriculum developers
Dominant teachers/teacher-centred	Students' initiations/student centred
Very structured curriculum	Flexible curriculum
Product oriented	Process and product oriented
Uniformity	Diversity
Single method (lecturing)	Various methods (lecturing, discussion, eperiment, investigation, practical work)
Transfer of knowledge	Constructivist
Stressing on theories	Theories and practice



Cognition	Affective, cognition and skills
Text-book oriented	Life oriented
Objective test	Authentic assessment/portfolio
Exit national exam as an end	Exit national exam as a tool for improving the quality of education

During the first of three years this project was focused on improving the quality of pre-service teacher education programs in the above mentioned three universities through revising their curricula and syllabi in order to meet the needs of the prospective users of the teacher education graduates, publishing textbooks, developing teaching materials and laboratory activities.

The belief that the development of pre-service teacher education program requires feedback from field experiences in school and the improvement of school effectiveness requires innovative ideas from teacher educators from universities led to the extension of the IMSTEP program, which was called Follow-up IMPSTEP, lasting from 2001 and ending in 2005. The extension was carried out in piloting activities in which each of the above mentioned three universities collaborated with 4-5 schools in their own regions to develop the student-centered learning of mathematics and science. During the piloting activities teachers and lecturers collaborated to design and to develop mathematics and science learning based on hands-on activities, daily life experiences, and local materials related to the problem and condition of the schools. Therefore, teachers and lecturers learned together and from one another to build collegiality. So through the lesson study program, teachers grow together professionally.

The teaching learning processes in the Follow-up IMSTEP program is an embryo lesson study. It consists of three steps of activities, that is plan, do, and see. In the plan step teachers collaborate with each other to discuss the learning activities design. Then, it is implemented in a classroom by one of teachers while the others observe the teaching learning process; these activities are called in the do step. In this step the following are observed: teachers' and students' activities, instructional interactions, teaching and learning context and setting, patterns of relation, subjects' involvement, and pedagogical logic. The classroom observation The last step is the see step where all teachers discuss and reflect the teaching learning process. Their discussion based on the students' activities in the classroom. The activities during plan, do, and see steps is a cycle of lesson study. The term of lesson



study is originated from Japanese word “*jugokenkyu*” . *Jugo* means lesson, and *kenkyu* means study or research.

The evaluation of the piloting project indicated improvements of (a) teachers’ competencies (creativity, questioning skills, experimental methods), and (b) teaching and learning processes, and (c) students’ activities, motivation, enthusiasm and performances. Besides, the project also resulted in the developments of CAIs for Chemistry, authentic assessment methods, student worksheets, and constructivist approach. However, the evaluation also identified that: (1) teachers have varied in their perceptions of the new paradigm of mathematics and science education; (2) the new approaches take much more time than conventional ones; (3) Enculturing innovation needs time; (4) the existing curriculum is found to be too crowded; (5) the existing class is still too big for the new approaches; (6) most teaching and learning processes were still oriented to the exit national exam; and (7) teachers were resistant to changes (Murata I., 2012).

For the piloting project, the following are the lessons learned: (1) The cooperation of three universities in implementing the project has improved the quality of the pre- and in-service teacher education programs; (2) The university-school collaboration has strengthened the quality of teaching and learning processes at the pilot schools and the three universities; and (3) The IMSTEP has improved the academic and quality of the related graduates in the three universities.

The experiences obtained during the IMSTEP project was exchanged and shared through discussion among educators and stakeholders concerned.

## **C. THE IMPLEMENTATION OF THE SISTTEMS PROJECT: THE YOGYAKARTA SUCCESS STORY**

### **1. Overview**

During 2006-2009 the *Follow-up* IMSTEP program was extended to a program that is called SISTTEMS (*Strengthening in-Service Teacher Training of Mathematics and Science Education at Junior Secondary Level*). In this program the lesson study was implemented in the same three districts: the Sumedang district under the supervision of UPI, the Bantul district under the supervision UNY, and the Pasuruan district under the supervision of UM. In this project, the definition of the Lesson Study was redefined as follows: Lesson Study refers to a series of activities





conducted by school teachers and teacher educators of the same subjects to improve the quality of teaching in the classroom (Gorman J., 2005).

Successful implementation of SISTTEMS has promoted and attracted educators and education institutions across the archipelago to perform it. The Ministry of National Education (MONE) under the auspices of JICA through PELITA (*Peningkatan Kualitas Tenaga Pendidikan SMP/MTs* or the Improvement of Junior High School Teachers) extended the piloting of lesson study from 2009 to 2013 in the following three other districts/cities: Padang City under the supervision of State University of Padang in Sumatra island, the Banjar Baru District under the supervision of University of Lambungmangkurat in Borneo island, and the North Minahasa District under the supervision of State University of Manado in Sulawesi island. MONE has also initiated to facilitate 52 TEIs all over the country to implement lesson study for improvement of pre-service program since 2008. In addition, Indonesia University of Education has succeeded dissemination of lesson study in 16 districts of West Java Provinces through school-university partnership project. Now, Jambi Province in Sumatra island is interested to adopt West Javas' success story of lesson study (Marsigit, 2003).

## 2. Success Story from Yogyakarta

In Yogyakarta the Lesson Study began with a limited number of schools and teachers of mathematics and sciences only, but has expanded to reach more schools and teachers of other subjects. This is summarized in the Table 2 below.

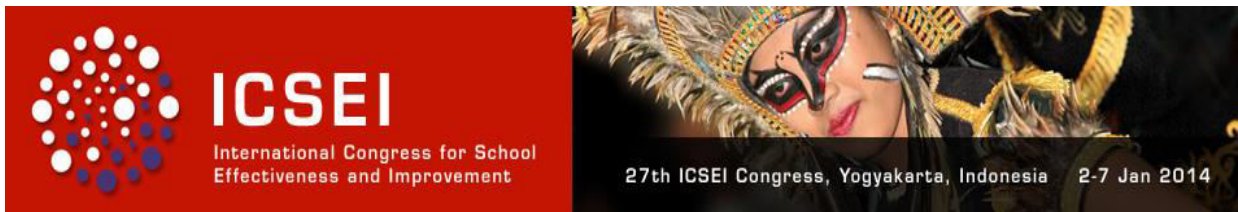
**Table 2: Data on the Developments of the Lesson Study in Yogyakarta**

Year	Number of Schools (JHS and SHS)*	Subjects Studied	Comment
2001	21	One school for one subject only	Piloting Lesson Study simultaneously supported by Teaching Material development at University  It seemed to emerge the culture of collaboration
2002	42	One school for one subject only	

			and communication among faculty members
2003	3 JHSs + 3 SHSs	Mathematics and Basic Sciences in each school	In this phase, the data were collected as the results of monitoring the Piloting
2004	105 new schools in one regency	Mathematics, Natural Sciences, Biology, English, Social Science, Javanese Language, Civics, Islamic Religion, Art and Culture, Physical Education	Involvement of Subject Teachers' Organizations It seemed to emerge the commitment of all sides to implement Lesson Study
2005	115 school in two regencies	The new scheme of : Plan-Do-See was developed i.e. one Plan for some Do	The new scheme is perceived as local creativity. It seemed to emerge the culture of collaboration among the teachers
2006	All public and Islamic JHSs in the Bantul Regency	Up to the devastating earthquake	Due to the earthquake, the culture of collaboration among the teachers was extended and intensified. Islamic School-based Lesson Study is perceived as nurturant effect of the implementation of Lesson Study.

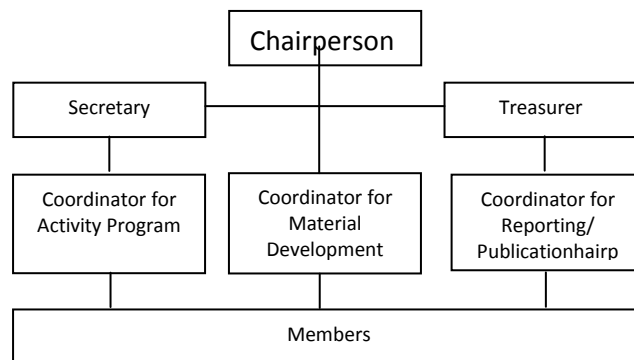
\*) JHS = Junior High School; SHS = Senior High School

Table 2 shows the involvement of MGMP, which stands for *Musyawarah Guru Mata Pelajaran*. It is non-structural organization of teachers, whose establishment is stipulated in the Government Regulation No. 38/1994 on Education Personnel. It is a professional forum for subject teachers at the *kabupaten/kota* (district/city) level. According to the guidelines issued by the then Directorate General for Primary and Secondary Education, Ministry of National Education (now the Ministry of Education and Culture). MGMP has five objectives:



1. To encourage teachers to improve their ability and skills to plan, implement and evaluate teaching and learning activities;
2. To discuss problems faced by teachers to carry out their daily responsibilities and to propose solutions in accordance with the characteristics of the subject matter teachers, school conditions, and communities;
3. To provide teachers with opportunities to share information and experience about the curriculum implementation and the development of science and technology;
4. To provide teachers with opportunities to express their ideas at MGMP meetings to improve their professional skills; and
5. To develop cooperation with other institutions to develop a conducive, effective and enjoyable teaching and learning processes.

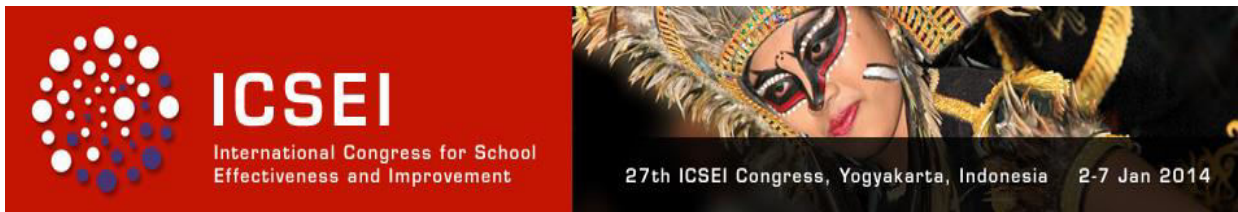
As mentioned before, MGMP is organized in each *kabupaten/kota* and the MGMP Committee members are elected from among member teachers. The Committee consists of Chairperson, Secretary, Treasurer, Coordinator for activity program, Coordinator for material development, and Coordinator for Reporting/Publication. The MGMP organizational structure is illustrated in Figure 1 below.



Picture 1: The Organizational Structure of MGMP

The MGMP activities have been arranged as follows: Monday for Civics, Indonesian Language, and Religious Education; Tuesday for English; Wednesday for Mathematics;



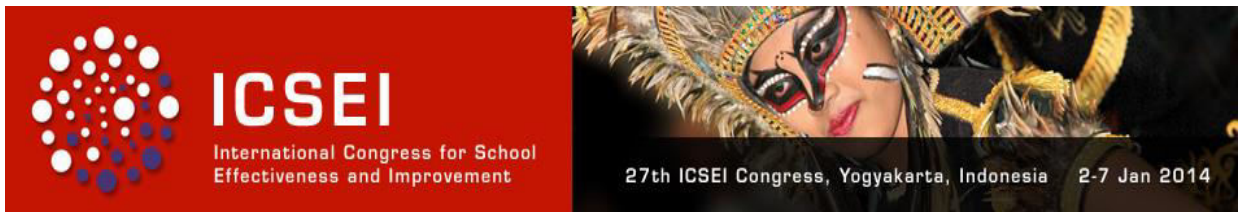


Thursday for Social Studies, History, Geography, Economics, Anthropology; Friday for no LS activity; and Saturday for Science, Chemistry, Biology, Physical Education.

The MGMP-based lesson study was conducted in 2007, participated by 331 JHS teachers of Mathematics and Science from 34 JHSs located in 17 sub-districts of the Bantul District. The activities were organized as follows: teachers of Mathematics met once in two weeks on Thursday (08.00-13.00), while teachers of Science on Saturday with the same duration. These teachers conducted the Lesson Study in eight home bases, with each home base being supervised by two teacher educators from Yogyakarta State University.

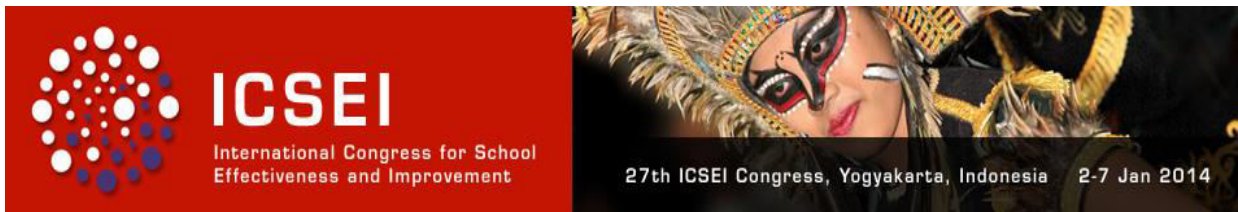
In the academic year of 2008/2009 up to the present time, the lesson study scheme has been developed. As has been mentioned before, it consists of three main steps: *Plan* (preparation), *Do* (Implementation and observation), and *See* (reflection/review). The Plan stage covers the following activities: reviewing the syllabi, developing the lesson plan, developing student's worksheets, developing the observation sheet, and preparing class management. The teachers do the planning through workshops. In the Do stage, one of the teachers in a group implemented the lesson plan, while other teachers observe. They observe what the teacher is doing, what the students are doing, the teacher-students and student-student interaction patterns, the students' activities either as their being responsive to the teacher tasks and as initiators. In the See Stage, teachers are involved in a meeting attended by model teachers, supervisors, observers, and stakeholders. This meeting is aimed at providing the participants to reflect on the lesson implementation and then find ways of improving the teaching and learning quality. In the period from April 2007 to June 2008, each Lesson Study Home Base carried out 12 Lesson Study activities as planned. Since the results were found promising, a new scheme was developed, i.e. 3-4 Plans to be followed by 6-7 Do and See activities.

The lesson study activities in Yogyakarta were disrupted by the devastating earthquake hitting the Yogyakarta Special Territory, with the Bantul District mostly heavily damaged, and part of the Central Java Province. In the Bantul District, the implementation of the lesson



study has provided evidence that this staff development strategy did not only help teachers to improve their professionalism, but also helped them recover their self-esteem and dignity. This was found out in the implementation of the lesson study following the natural disaster hitting most parts of the Bantul District on 27 May 2006, at 5:54 local time. This medium-sized earthquake in fact hit the central area of the Java Island, Indonesia, but the Bantul District suffered most. Lasting about 60 seconds, the earthquake caused widespread deaths and destruction for the heavily populated region i.e. Bantul in Yogyakarta Province and Klaten in Central Java Province. More than 5,700 people were killed and 37,000 people were injured. Over 156,000 houses and other structures were totally destroyed.

In such a situation, education was found to play a significant role in reducing the unnecessary victims by improving people's awareness on the disaster through lesson study. The lesson study activities covered developing teaching materials and utilized a mathematical modeling of the disaster processes and impact so that students could learn both mathematics and the nature of the disaster. The Lesson Study activities proved to be effective in lifting students' enthusiasm in learning science, helping students to develop their experimental and discussion skills, and in giving opportunities to students in developing their own scientific concepts by themselves. It was also reported that by applying the constructivism approach, the students could find out their best style of learning. Competition rose among groups of students in presenting the results of their works and in defending their presentations. This forced students to learn more theory for their own sake. As a result of Lesson Study activities there were many teaching materials developed either by lecturers or by teachers. Those materials were either developed by lecturers or teachers in their own classrooms or by lecturers and teachers altogether during Lesson Study activities. In general, lecturers and/or teachers developed the teaching materials after thinking extensively what and how to develop teaching materials for a certain topic, and then developed the materials. Further, they tried out the teaching materials in their classrooms and revised those based on the result of the try out. All sides concluded that lesson study activities has succeeded to recover from the impact of

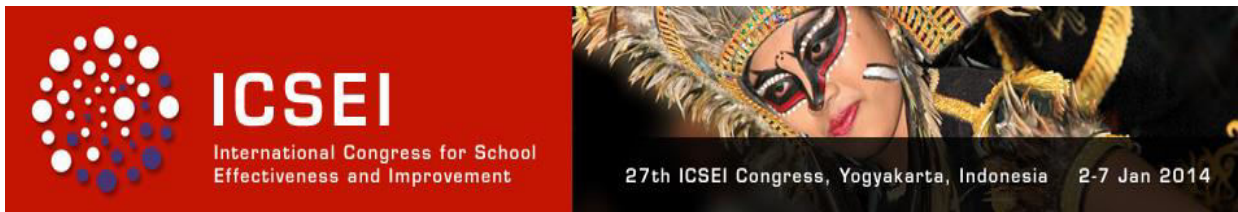


disaster and improve the school qualities in Bantul (Sadiq and Subanar, 2010 and Suprayogi Hadi, 2009).

Success stories of the implementation of the lesson study to the teaching of mathematics and science have encouraged teachers of other subjects to implement it in their classrooms. This has changed the ways teachers and students think and do during the teaching and learning processes. They become ready to learn from one another and share what they have learned for more effective learning. In short, improvement has been achieved together and the achievement has been achieved collectively (Isoda Masami, 2007).

To provide evidence of the lasting impact of the lesson study activities, a research study has been conducted in 2013. In this study data on the impact of the lesson study activities were collected through questionnaires to be filled in by teachers, students, and principals, interviews with teachers, students and principals, observations of the lesson study activities cycles, and achievement testing. The results showed that :

1. Teachers participation 60% – 75 %
2. The teachers be more concerned about their students differences
3. The teachers strived to facilitate students activities
4. The teachers employed various method of teaching
5. The teachers employed various method of evaluation
6. The teachers strived to connect the relationship among Subject-Matter
7. The teachers developed Contextual Teaching Learning (CTL) approach
8. The teachers developed various interaction
9. The teachers employed small group discussion
10. The teachers developed the scheme for competences achievement
11. The teachers facilitated their students to be more active
12. The teachers employed various teaching aids
13. The teachers employed various learning resources
14. The teachers strived to implement new paradigm of teaching

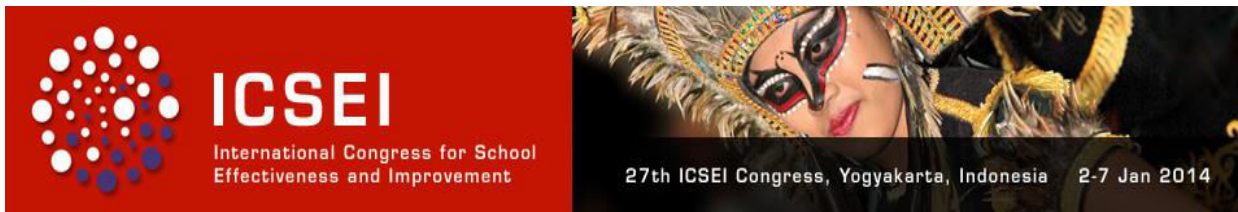


15. The teachers were more passion to facilitate their students
16. The teachers have their habit to reflect their experiences of teaching
17. The students were more interested to learning object
18. The students were more motivated to engage in teaching learning processes
19. The students were more active in the class.

With these findings, both teacher educators and teachers may be more convinced that improvements in both pre-service and in-service teacher education may be achieved through the Lesson Study strategy by empowering the MGMP.

#### **D. CONCLUSIONS**

It can be concluded that Lesson Study was to be perceived as a useful and effective framework to develop teachers professionalism by performing their accountability and sustainability of teaching, through collaboration among the sides of educational practices consist of teachers, supervisor, lectures and stakeholders. The seminar on the results of the lessson study activities have been found useful as a means of: sharing the results of the lesson study for all groups, teachers, lecturers, and stakeholders; sharing any common problems found during thelesson study implementation; sharing any good solutions to the above problems, and reporting and sriting the finasl resultls of the lesson study implementation as well as its possibility to expand it into a wider scope of both teachers and schools.



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