



Development of school-based in-service training under an Indonesian mathematics and science teacher education project

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Abstract

This article aims to investigate how to involve the entire school in in-service training (INSET) by means of a case study. It examines the cases in the Indonesian Mathematics and Science Teacher Education Project (IMSTEP). The results suggest that great emphasis be placed on various factors in order to develop INSET in the Indonesian context, particularly as a school-based training programme. First, the function of key persons is important. They are capable of initiating informal, yet genuine, sharing of experiences with their colleagues. Thus, the principal's commitment is essential. Depending on the principal's support and facilitation, the informal sharing of experiences can develop into a movement of professional development for teachers throughout the entire school. Furthermore, the collegial interests are also important. In the lesson study implemented under INSET, it is necessary for participants to cultivate the attitudes of mutual learning.

Keywords collegiality, Indonesia, Indonesian Mathematics and Science Teacher Education Project, INSET, key persons, leadership, lesson study, professional development

Introduction

The professional development of teachers refers to their growth in terms of knowledge, skills and judgement with regard to the teaching process in the classroom and their contribution to the professional community (Little, 1992). The observation of and reflection on lessons as in-service training (INSET) fosters such growth (Joyce and Showers, 2002). This includes colleagues learning from each other by observing each other's lessons. In order to carry out such practices, there is a strong need to develop

collegiality in schools (Barth, 1990; Leithwood, 1992; Ose and Sato, 2003). This need does not exist only in developed countries: Dalin (1994) and Harvey (1999) demonstrated the importance and need to promote the observation of and reflection on lesson practices in developing countries.

However, in the case of developing countries, with particular reference to the Sub-Saharan regions, since the teachers' understanding of the subject matter in various fields is still insufficient, Winkler (2001) and Mokuku (2001) claim the necessity for providing the theoretical background of subjects. Moreover, it has been pointed out that in developing countries, INSET is not thorough in terms of changing the actual practices during lessons, and the follow-ups conducted on INSET are inadequate (O'Sullivan, 2002). In addition, there is a serious lack of collegiality in schools, which is detrimental to the professional development of teachers shortly after their induction (Indoshi, 2003).

In Indonesia, which is the focus of this study, the situation regarding INSET is similar to that in other developing countries. In other words, teachers possess a severe shortage of knowledge on the subject matter in various fields, particularly those of mathematics and science at the secondary educational level (Joni, 2000). Moreover, Japan International Cooperation Agency (JICA) (2003) and Joni (2000) suggest that there is a serious lack of relevance in the content of INSET with regard to daily teaching practices. Although there are programmes targeting teachers' practices during lessons in terms of observation and reflection, such attempts tend to be limited to only some teachers and it is difficult to disseminate the benefits to the entire school (Saito et al., in press).

The literature mentioned above has several limitations. First, Joni (2000) and the JICA (2003) deal with general systems of INSET or teacher education in Indonesia, and do not cover the details of concrete cases regarding INSET. Although there is a study based on a concrete case (Gardner, 1995), this case pertains to the INSET project in the 1980s. Thus, there is a necessity to conduct a larger number of case studies on the INSET programme. Second, there is a serious lack of academic studies, as well as professional and managerial attention, concerning how to disseminate the impact of INSET to the entire school. Due to this dearth of studies on strategies to disseminate the impact of INSET, Indonesian schools and authorities seem to have difficulty synthesizing the effects of various teacher training projects in order to enhance students' learning. Thus, it is necessary to investigate how to involve the entire school in the INSET process.

Therefore, this article examines INSET cases in Indonesia. The study investigates the cases of schools in which teachers have begun to share their experiences and insights on the impacts of INSET. Based on these cases, the article investigates how to involve the entire school in the INSET process. The study examines cases observed in the Indonesian Mathematics and Science Teacher Education Project (IMSTEP) and is divided into five sections. Following the introduction, the second section explains the method of studying. The third section includes a description of the cases, which comprises the outline of the project; the content of INSET; and information on case schools. The fourth section provides an analysis based on the description of the cases and lists the factors necessary for promoting the involvement of the entire school. Finally, the fifth section of the article presents a conclusion drawn from the results of the case study.

Method

Data collection

The authors were involved as team members in the implementation of IMSTEP, and they collected information on the progress of the activities by directly observing the lessons and by exchanging information with other colleagues from the universities and schools during the project. In addition to the daily activities of IMSTEP, the authors conducted interviews with teachers for more details. The study examines three schools: one junior high school in Bandung, West Java and two senior high schools in Malang, East Java. The number of participants in the interview process was eight: one Mathematics teacher from the junior high school; four Mathematics and Science teachers from one of the senior high schools; and three Science teachers from the other. After working on the project for one and a half years, the authors had identified these interviewees as leading and active practitioners in the project. They were selected on the basis of the information provided by the university faculty members, who were their counterparts in the universities and had a good understanding of the situation in other schools. Professional translators translated all the transcripts of the focus group discussion from Indonesian to English and typed them out.

Study period

The authors observed the project activities in the schools throughout the implementation of IMSTEP from October 2003 to September 2005. They interviewed the teachers mentioned above in May 2004, May 2005 and August 2005. Each interview lasted approximately 90 to 120 minutes. In order to triangulate, the authors observed lessons conducted by some of the interviewed teachers. The period of observation was August to September 2005.

Method of analysis

This article employs the methodology of the case study as an analytical method (Cohen et al., 2000; Creswell, 1998). In other words, it provides an in-depth description and interpretation of the cases obtained from IMSTEP and the generalized lessons that were learnt. For this purpose, the authors focused their analysis on statements about the involvement of the entire school in INSET. In order to achieve this goal, the next section comprises a description of the outline of IMSTEP; the framework of INSET implemented under IMSTEP; and the cases of the three schools. The fourth section presents an analysis, which investigates the factors necessary to promote the dissemination of the impacts of INSET implemented under IMSTEP on the entire school.

Description of the cases

Outline of IMSTEP

The Government of Indonesia and the Japan International Cooperation Agency (JICA) have been working on IMSTEP. The institutes that participated in IMSTEP were the Indonesian University of Education (UPI) in Bandung; the State University of Yogyakarta (UNY); and the State University of Malang (UM), all of which are located on the island of Java. The purpose of IMSTEP is to enhance the capacities of teachers in mathematics and science through pre-service teacher training as well as INSET.

Under the framework of technical cooperation, JICA dispatched experts possessing education-related backgrounds, particularly in science and mathematics education, to conduct the project.

In order to address the teachers' current needs concerning the practices followed in their classrooms, IMSTEP introduced Piloting Activities (PA) in 2001. PA, a kind of 'lesson study', is a method of in-service teacher training that involves inviting others to attend one's lessons for the purpose of observation. Lesson study is one of methodologies of INSET for professional development and is based on reflections regarding concrete practices, observed during lessons by teachers and others, including collegial teachers or people from external sources such as university faculty members (Inagaki and Sato, 1996). There are various terms for activities similar to lesson study, such as 'action research' (Noffke, 1995), 'coaching' (Joyce and Showers, 2002) or 'clinical supervision' (Stiggins and Duke, 1988: 7); however, all these activities share a common aspect, that is, a teacher invites others to attend his/her lesson for observation and reflection on his/her teaching practices along with the observers. This article uses the term 'lesson study' to refer to such activities implemented for the professional development of teachers.

Outline of piloting activities

As part of IMSTEP, both school teachers and university faculty members conducted PA collaboratively. They jointly developed lesson plans, including all the teaching materials and students' worksheets, implemented these plans in the classroom and reflected upon the lessons. PA targeted both junior and senior high schools. UPI in Bandung chose three junior and two senior high schools as partners, while the other two universities (UNY and UM) selected two junior and two senior high schools each. Therefore, the total number of partner schools was 13. UPI dealt with grade one, UNY was in charge of grade two and UM managed grade three at both the lower and upper levels of secondary education.

As mentioned above, the PA cycle comprised three stages – a planning session, the open lesson and a reflection session. The planning session was a preparatory workshop that each university held at the beginning of each semester for all the participants involved in PA. The participants were science and mathematics teachers in the targeted schools, who allowed other teachers to attend their lessons for observation and criticism, as well as the university faculty members involved in science and mathematics education who worked with the school teachers. The group spent the entire day generating consensus on which topics to cover through PA. They utilized parallel sessions, held according to their subjects, to consult with colleagues. In these sessions, they discussed the teaching methodologies, including all the teaching materials and students' worksheets to be used, and the approximate time schedules during the semester. After the workshop period, each teacher was fundamentally responsible for detailed decisions regarding the lesson plan. The targeted teachers occasionally sought consultation with the university lecturers.

In the next stage – the open lesson – the teachers invited their counterpart faculty members from the university to observe their lessons. Sometimes, other targeted teachers from the same/other schools also participated in the observation of lessons. The following procedure was usually followed for an open lesson: a lesson began with

an introduction, after which the students' knowledge on the topic was tested. The teacher then assigned tasks to the students, who worked in small groups. The targeted teachers set time for group work in every observed lesson. There were 45 to 50 students in a class. The number of students in a group varied depending on the situation in the classroom; in many cases, the number of students in a group ranged between four and six. The group work involved primarily physical tasks and internal discussions. The physical tasks, which included experiments and measurement-taking, often involved solving problems on worksheets with the other group members. Based on the results of the activities, a class discussion was held, and students and teachers drew conclusions about their topics through an exchange of ideas.

The third stage – the reflection session – was conducted almost immediately after the observation of the open lesson. In this session, the teachers and observers shared views and comments. The length of the discussions varied from 30 to 90 minutes, depending on the availability of time. The observers shared their learning from the observed lessons, as well as providing comments and input to the teachers to enable them to improve their lessons in the future.

During the semester, a team of two to three teachers from the targeted schools and at least two university faculty members for each subject at each educational level repeated this entire cycle. They attempted to ensure that PA would cover all the chosen topics in the semester. The number of lessons and reflection sessions varied according to the decision made by each department on the number of topics, which varied between two and three. In general, the teams conducted PA at least once a week for each teacher.

In promoting PA, the universities involved in this project also attempted to introduce constructivist teaching and learning approaches to the targeted teachers. Conventional approaches to learning emphasize the transmission of knowledge and skills from teacher to students based on reading and lecturing (Collins et al., 1995). Collins et al. (1995) list broadcast radio, television, videotapes or films as possible additional media but it is unrealistic to expect such technology in the classrooms of developing countries. In most cases, including that of Indonesia, the methods used by teachers mainly centre on lecturing. On the other hand, constructivist views lay emphasis on communication among students. Their purpose is for students to jointly construct an understanding of different ideas; therefore, this approach requires active discourse and consensus building through discussion, argumentation, enquiry or brainstorming (Collins et al., 1995; Fraser, 1995). In this project, the universities incorporated a constructivist approach into the PA in an attempt to foster the learning of mathematics and science at both the lower and upper secondary levels. In more concrete terms, the teachers and faculty members jointly attempted to introduce a greater number of activities or experiments, small group activities, presentations and discourses.

As Saito et al. (in press) emphasized, there is a strong necessity to involve the entire school in INSET and the lesson study practiced by IMSTEP. The authors found significant and strong impacts of PA on the lessons for PA teachers. These impacts could be observed in the strengthened academic basis of lessons as a result of working with the university faculty members; the introduction of manual activities and discussions; and the increase in active participation by students in the lessons (Saito et al., in press). Nonetheless, the results were limited only to the targeted teachers. From the viewpoint of learning by the students, there exists a need to ensure students' full

participation in the lessons conducted in all subjects. Therefore, disseminating the results of PA – the INSET implemented under IMSTEP – from the limited number of mathematics and science teachers to the entire school poses a great challenge.

Cases from targeted schools

This section describes the cases observed in schools conducting PA. Some schools have witnessed an emerging trend wherein teachers who conduct PA have begun to share their results with other teachers. As described in the former section, we will focus on the cases of two senior high schools in Malang and one junior high school in Bandung. This section will first describe the cases at Malang and will then proceed to describe that of the lower secondary level at Bandung.

The case in Malang

With regard to the high schools in Malang, this article examines the cases in one public high school (School A) and one private PA high school (School B), both conducting PA. Both schools are located in the city of Malang and have been conducting PA since 2001. In August 2005, the total number of students in Schools A and B was approximately 1000 and 830, respectively. As mentioned earlier, the third grade in these schools was targeted in the academic year of 2004/2005. They were the target group of students in 2003/2004, because the target group of students in the schools at Malang was the second grade. Thus, most of the students were already accustomed to the type of lesson conducted under the PA system.

School A

In School A, the teachers conducting PA began to collaborate and share what they learned in the process of PA. In 2003, as a base to develop their learning, the teachers organized the self-learning associations – Musyawara Guru Mata Pelajaran Sekolah (MGMPs) – with their colleague teachers in their teaching subjects. In Indonesian schools, teachers largely recognize MGMPs as a group for sharing the experiences of a representative teacher from each school who has been trained at the city/district or sub-regional level. However, in this school, prior to the commencement of PA, there were no such organized activities.

One of the key persons who initiated MGMPs in School A described the purpose of collaborating within MIPA as follows:

In the past, teachers always worked alone without being aware of other teachers' problems or sharing their problems. Moreover, we discovered that it was easier for us to solve the problems if we discussed them with our colleagues. We employ MGMPs as a media to share and solve these problems.

These teachers conducting PA, including English teachers, took a step further and organized a lesson study that transcended the boundaries of their subjects. They initiated this activity in November 2004 and conducted it five to six times until January 2005. Young teachers organized this activity through informal networks and also informally decided on a plan to make the lessons available for observation and reflection. However, these teachers have discontinued this activity since the last observation and reflection in January 2005.

The teachers who had not organized the lesson study did not necessarily share the

vision or show an interest in activities where invitations were extended to attend lessons for observation and reflection. The key person described the situation as follows:

Although my colleagues understand and recognize the importance of introducing the constructivist approach, it does not necessarily mean that they would practice it in the classroom. Some teachers are already busy enough, and they cannot devote sufficient time to this activity. In addition, some teachers are confident enough of their own teaching methods and will therefore not accept other people's comments or ideas.

The principals of this school have been frequently transferred to other schools. When the authors had to interview a key person in the school in June 2004, the then principal decided to disseminate this system to other subjects. However, due to the transfer of personnel, a new principal joined the school in October 2004, and another joined in May 2005. Thus, in the last two years, School A has experienced the appointment of three principals. One of the interviewees described the situation as follows:

Although the post of principal in School A tended to be reserved for those who would retire soon, it now seems to be available for novices. Earlier, principals did not prefer making changes or actions to reform the school, opting instead for peacefulness at the end of their careers. Nowadays, they find it difficult to recognize the importance of lesson study for different reasons. This is because they lack job experience and knowledge about improving the school. Further, transfers to other schools prevent them from occupying their posts for a sufficient period of time.

School B

In School B as well, the teachers in charge of PA began to organize MGMPS. The key person, from the biology department, initiated this sharing of experiences with other teachers:

After beginning work under PA, I realized that it was hard for me. My students were very creative. I thought that teaching under constructivism would be much easier than teaching in the conventional way. However, I was wrong. The students were able to develop their knowledge; they knew more than their teacher and they asked many more questions than they used to. It was exhausting to catch up with them. I realized that I had to study more. Thus, I decided to seek admission in a postgraduate school for a master's degree; I completed the programme whilst teaching full-time. I also invited other colleagues from the same department to observe and reflect on each other's lessons.

Such efforts attracted the attention of some teachers who taught other subjects, such as social studies. They were interested in the PA approach since they believed that it could ensure the introduction of a new curriculum. In 2004, the government introduced a new curriculum having its roots in the constructivist approach (Hamid, 2004). Mathematics and science teachers invited each other, as well as university faculty members, to attend their classes in order to observe and reflect upon their experiences. A limited number of teachers of social studies, such as geography and history, also joined this group and invited the key person to their lessons and reflected on their teaching practices together.

The principal of this school possesses a deep understanding of the implications of PA and is willing to disseminate it to the entire school. In view of the gradual expansion of interest in the PA approach among the teachers, the principal decided to conduct a workshop on lesson study and open it to the public in February 2005. Observers from various parts of Indonesia participated in this workshop. They observed two lessons, both biology classes. After this workshop, the principal informed one of the authors

that they had begun lesson study as a regular activity. Later, they started a regular weekly internal lesson study and decided to conduct an open-house lesson study four times a year. This lesson study activity involved every teacher inviting other colleagues to their classes at least once a year for observation and reflection. Thus, this school has disseminated PA throughout the entire school.

The case in Bandung

School C

This section introduces the case of one junior high school in Bandung (School C). School C has also been participating in PA since 2001. School C is a public school and is located in Bandung city. The total number of students in the school is approximately 1050. As stated above, the first grade in Bandung was targeted right from the initiation of PA. This school assigned PA to various teachers in shifts, rather than allocating the assignment only to particular teachers.

School C decided to disseminate the results of PA, namely lesson study activities, to other subject teachers and get the entire school involved in this process. Interestingly, this decision was rooted in the financial crises experienced by Indonesian educational institutions. In the fiscal year of 2005, except for the basic salaries of teachers and educational personnel, the budget disbursements for developmental projects remained delayed. Currently, as of mid-August 2005, IMSTEP is one of the projects that are unable to receive financial support from the ministry due to this delay. In such a situation, UPI, which is in charge of the Bandung area in IMSTEP, could no longer mobilize their scarce financial resources required to conduct PA. The managerial members in UPI decided to negotiate with schools conducting PA for the financial self-reliance of these schools. Accordingly, the school would cover the necessary expenses of teachers conducting lesson study, while the university would make arrangements for the necessary costs of faculty members.

In addition, both School C and UPI agreed on self-reliance with respect to PA and decided to expand its present scope from the targeted teachers to those teaching other subjects and to develop collegiality beyond the boundaries of the subjects. By this time, although School C had a new principal, this principal was accustomed to the collaboration with UPI from experiences as principal in a former assigned school, and was well aware of PA as a result of participating in the workshop held by IMSTEP. In this manner, the financial crises prompted the principal to a decision leading to the dissemination of the PA results to the entire school. School C decided to allow teachers to invite their colleagues to attend their lessons for observation and reflection, and it became necessary for all the teachers to do so at least once a year.

In early August 2005, a seminar was held in School C for all its teachers to share their PA experiences and the conceptual framework of the lesson study. Based on the request from this school, UPI dispatched the concerned faculty members to conduct PA in order to provide keynote speeches and presentations for the introduction of the lesson study. During the seminar, the faculty members from UPI played a video to demonstrate how a previous PA teacher had conducted a lesson. This served to stimulate a discussion among the teachers. For example, one teacher at the seminar commented as follows:

I would like to share the problems faced while teaching every lesson. My big concern, in particular, is how to motivate students to learn. I tried to introduce similar methodologies of teaching, such as organizing the students into small groups or incorporating the use of mediating artefacts. Actually, I do practise such ways of teaching. However, my efforts do not yield responses as good as those obtained by the PA teacher. I would like to learn more.

Analysis

So far, this article has described the situation with regard to the expansion and sharing of the results of PA in three schools. This section provides an analysis with special reference to the kinds of factors that promoted the dissemination of the results in the schools. First, this section will identify factors that promoted or hampered the sharing of the PA results in each school, and each factor will then be investigated.

The case of School A can be characterized as a strong and self-reliant association of mathematics and science teachers; however, it illustrated the difficulty for such associations to progress and cover the entire school. PA triggered this self-initiated association among the teachers in both departments. A key person organized this association among teachers to share and collectively solve problems related to teaching. This can be termed as an association among teachers based on the 'bottom-up approach' since the teachers acted even before the school managers made the decision to organize such an association. However, the inclusion of the entire school in this trend is yet to be observed. In particular, mutual observation and reflection has not been extended to teachers of other subjects. From this case it can be inferred that although there exists a strong internal collegiality among a limited number of the teachers, mainly of mathematics and science, there exists a difficulty in disseminating this collegiality to the remainder of the teachers.

With regard to the case of School B, the authors observed a strong association among the teachers, which a key person developed, and a larger involvement of the entire school as compared to School A. The key person initiated the self-reliant association through the MGMPS and conducted the mutual observation and reflection of lessons. Thus, this school can also be considered to have followed the bottom-up approach. In this school, the teachers of other subjects also participated in the mutual observation and reflection of the lessons; hence, the results of the bottom-up approach can be considered to be larger than that in School A. In addition, the school principal made a decision to define lesson study as a regular activity. Thus, the association among teachers gradually expanded to include teachers of other subjects. This finally led the school manager to consider this trend as a means to improve the school.

In the case of School C, the leadership of the principal was the key factor in promoting lesson study in the school and in implementing the follow-up of PA. As compared to the other cases, although the principal strongly endorsed the introduction of the lesson study as a regular activity in School C, the association among the mathematics and science teachers was not particularly strong. The interviewee from School C, a mathematics teacher, is one of the PA teachers who extensively developed their professional capacities in teaching. This interviewee's comments showed a sharp difference in the rate at which collegial interest or attempts at lesson study emerged in Schools B and C:

I have never opened my lessons to my colleagues in the entire mathematics department, except for one PA teacher. I checked with my colleagues in the science department, and they have never done so. There was no such an attempt in other subjects either.

Therefore, this case in School C can be termed as an example of the ‘top-down’ approach in the introduction of INSET. Interestingly, external conditions, such as financial stagnancy in the continuation of PA caused by the delay in the budget disbursement from the Ministry to the university, influenced the principal’s decision. Since the decision in this school was not based on the gradual internal development of collegial mutual support among the teachers, there is a strong necessity to carefully establish and implement the strategies geared to increase teachers’ understanding of and participation in INSET.

Concerning the cases examined in this article, there seem to be three important aspects for the development of INSET on a smaller scale so as to ensure the entire school’s involvement: the existence of a key person, effective leadership, and the necessity of collegial interest from teachers of other subjects. In this section, this article will further investigate each of the above-mentioned points.

Existence of a key person

One of the important factors found both in Schools A and B is the existence of key persons among the teachers to promote collegial association. Regardless of whether the association among teachers was strong in the entire school, such key persons contributed greatly to the enhancement of collegial sharing of experiences and insights among mathematics and science teachers. PA had an impact on the growth of teachers from the viewpoint of contribution to the professional community – one of the important aspects of a teacher’s professional development (Little, 1992).

In cases where a key person is present, other teachers in the same department also tend to get motivated and participate actively in the sharing process. In the case of School A, they organized MGMPS and shared their problems with each other. In School B as well, the teachers took a step further by observing and reflecting their lessons together. The authors observed that the decisions made by key persons with regard to their commitment and contribution to their colleagues led to organizational solidarity and joint exploration of the problems encountered during teaching.

However, there exists a gap between the development of collegiality among teachers of the same subjects and the dissemination of such collegiality to the entire school. Although some teachers of other subjects showed an interest in the lessons conducted by the key persons’ groups in School B, this does not necessarily demonstrate collective interests of the entire school. If a collegial relation becomes more active and enriched only among teachers of some subjects, the situation of ‘Balkanisation’ of the school (Hargreaves, 1994: 213–15) remains unresolved. However, this could be a starting point to overcome it. Therefore, key persons’ attempt at breaking the culture of ‘Balkanisation’ in a school requires recognition, assistance and leadership by school managers for further development.

Importance of leadership

There exists a strong contrast between School A and the other schools in terms of the leadership shown by the respective school principals. In Schools B and C, the authors observed the principals to be strongly determined to disseminate the results of PA and lesson study throughout the school; this determination actually led them to execute their decisions. Further, the cases in Schools B and C showed some aspects of the

development of INSET, triggered by PA. For example, it began on an extremely small scale and then the principal made a decision to involve the entire school in the observation and reflection activities. This reflects the importance of the principal's commitment to observation and reflection in the school. Day (2003) reports that school principals in developed countries are increasingly recognizing the importance of such activities.

In the case of IMSTEP, the university faculty members did not necessarily seek the active involvement of the principals in PA. Rather, the focus was solely on the subject teachers, and this confinement of focus constrained the development of INSET with respect to its dissemination throughout the entire school. Therefore, there is a strong necessity for considering this matter in the forthcoming school-university partnerships and collaborations as well as in the INSET provided by external agencies.

In School A, the growth of the informal network of teachers could not be transferred to the others due to the lack of recognition and commitment shown by school principals as a result of their short tenure. In addition, the case of School A shows the importance of commitment by the principal as a representative of the school. Although the key persons conducted informal lesson study on several occasions, they could not continue from January 2005 till the present day. This limitation of the informal network exists when the teachers run the activity by themselves, and it demonstrates the necessity of attention, support and facilitation by those at managerial levels.

Necessity of the interest of colleagues in other subjects

The examination of the cases reveals another important factor that should be considered for the development of PA; namely, it is necessary to attract an interest in other subjects. School B shows the most active participation from teachers of subjects other than mathematics and science, and recently, these teachers commenced lesson study in their schools. It is now the official commitment and policy of the school to permit each teacher to invite other teachers to their lessons for observation and reflection. Even before the commencement of this activity, some of the teachers observed and reflected together with teachers conducting PA. In this case, School C is in a position similar to that of School B, wherein all the teachers participate in the lesson study, although its outcome still remains to be observed.

However, in these cases, the issue of sustainability needs to be considered. As seen in the case of School A, the colleagues demonstrated a strong interest in lesson study; however, if there is a lack of systematic planning and motivation to continue lesson study, this interest will not be sustained. Therefore, preparatory planning for deciding the schedule is essential. Presently, even in School B, the teachers find it difficult to clearly decide beforehand the date of each weekly open lesson, and the information is circulated on short notice. Further, the number of participants is still limited, around five to ten each time. Thus, it is necessary to consider the planning method for further development.

With regard to sustainability, the facilitation of reflection is crucial (Inagaki and Sato, 1996). If the teachers do not believe that they can learn from others' teaching practices and comments, it may discourage them from continuing to participate in such observations and reflections. As mentioned in Saito et al. (in press), the discussion in PA

implemented under IMSTEP tended to be based on superficial observations in lessons, rather than on the actual practices followed during the lessons. Moreover, it should be emphasized that the purpose of lesson study is not one-sided criticism but mutual learning. In order for the participants of lesson study to develop mutual learning, there is a necessity for moderators or facilitators to highlight the points mentioned above from time to time.

Conclusion

The purpose of this article was to conduct a case study on INSET in Indonesia in schools where teachers have begun to share their experiences and insights on the impacts of INSET. Based on these cases, the present article investigated how to get the entire school involved in the INSET process. This study examined the cases involved in IMSTEP. The results suggest that emphasis should be placed on various factors in order to develop INSET in the Indonesian context, particularly as a school-based training programme. First, the function of key persons is important. They are capable of initiating informal, yet genuine sharing of experiences with their colleagues. The case also revealed that commitment by the principal is essential. Depending on the principal's support and facilitation, the informal sharing of experiences can develop into a movement of professional development for teachers throughout the entire school. This point also suggests that INSET can begin on a small scale, and then expand. Furthermore, collegial interests are also important. In the lesson study implemented under INSET, emphasis should be placed upon the necessity of keeping in mind the attitudes of mutual learning.

Further research should consider the following points. First, it is necessary to conduct a more detailed observation of the future progress in each school. The school and its INSET can be extremely flexible and can change occasionally. Thus, an in-depth inspection is necessary to follow up on these movements. Subsequently, more case studies should be collected. There exists a need to investigate the differences or similarities in the cases of other schools. Moreover, it is important to investigate the effects of INSET on the development of teachers. The attempts at conducting lesson study and involving the entire school are still at a nascent stage in the schools mentioned in this article. It is necessary to focus on how teachers change or do not change themselves through INSET. Furthermore, it is crucial to examine the impacts of INSET on students' learning; thus, INSET should also be measured from this viewpoint. The interactions of students with teachers during the lessons, the reflections on lessons and the cognitive aspects of the process should be also examined.

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