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Eisuke Saito [a]; Paidi Hawe [b]; Suratsih Hadiprawiroc [b]; Sukirman Empedhe [b]
[a] International Development Center of Japan, Shinagawa, Japan [b] Faculty of Mathematics and Science, State University of Yogyakarta, Indonesia

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Initiating education reform through lesson study at a university in Indonesia

Eisuke Saito[a]*, Paidi Hawe[b], Suratsih Hadiprawiroc[b] and Sukirman Empedhe[b]

[a]*International Development Center of Japan, Shinagawa, Japan;* [b]*Faculty of Mathematics and Science, State University of Yogyakarta, Indonesia*

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This paper analyses the issues involved in promoting lesson study in an Indonesian university, based on a case study of the Faculty of Mathematics and Science (FMIPA) of the State University of Yogyakarta. Five points are discussed. First, conducting lesson study with schools revealed that the faculty managers noticed the ignorance about lesson study in FMIPA and decided to conduct lesson study by themselves to learn more. Second, despite using a didactic teaching approach initially, more faculty members began using group work in their lessons. Third, despite the emphasis on the importance of observing students' learning realities, most faculty members focused on teaching methodology. Fourth, in terms of reflection, they could be classified as evaluation-minded in order to be critical about the observed lessons, and learning-minded to appreciate the observed lessons. Fifth, the strong involvement of managers is necessary to develop lesson study as a daily teaching and learning practice.

Keywords: Indonesia; university teaching and learning; lesson study; reflection; observation

Introduction

Teacher-focused teaching aims at the transmission of knowledge to and the acquisition of information by students, while a student-focused approach aims to encourage students to develop and change concepts on their own (Trigwell, Prosser, and Tailor 1994). These teaching styles then tend to correlate with the learning approach adopted by students, e.g. a surface approach (attempting to remember the content) and a deep approach (attempting to make sense of the content) (Trigwell, Prosser, and Waterhouse 1999). Adopting the latter approach depends on the student's desire to gain a personal understanding of the material presented. In contrast, the former approach involves the desire to merely satisfy the task or course requirements; this is because in such cases, learning is viewed as an external imposition that is largely unrelated to an individual's personal interest (Entwistle 1996). With regard to teachers who follow teacher-focused teaching, their students tend in general to adopt a surface approach (Trigwell, Prosser, and Waterhouse 1999, 66). But a student who adopts the deep approach would generally learn more and perform better than one who adopts a surface approach (Marton and Säljö 1976; Biggs 1978; Entwistle and Ramsden 1983).

A number of previous studies have focused on identifying how a conceptual change in lecturers' perspectives on teaching and learning could alter their teaching style from being teacher-focused to being student-focused. While some scholars state that short-term training

*Corresponding author. Email: saito.e@idcj.or.jp

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would be sufficient to achieve this goal (Ho, Watkins, and Kelly 2001; Gilbert and Gibbs 2004), others claim that continuous improvement through reflective practice and habitual professional development is necessary (Bucklow and Clark 2000).

However, the studies mentioned above were based on cases in developed countries. With regard to the cases from developing countries, particularly in relation to action research (AR) in higher educational institutions, some studies have been conducted in African countries (Robinson and Meerkotter 2003; Weiler 2001). However, there is a dearth of research contributions from Asian countries, particularly developing ones, based on actual practices, except cases in Hong Kong (Kember 2002; Kember et al. 1997). Examining the case of Indonesia, which is the target of this research, Joni (2000) highlights the necessity of improving the quality of teacher education programmes. Nonetheless, despite researches on issues in relation to a teacher educator's beliefs from comparative perspectives (Udin and Johnston 2006) or the collaboration cases between schools and universities (Saito, Harun, et al. 2006; Saito et al. 2007), it is still rare for Indonesian teacher educators to focus on their own teaching approaches for their capacity development in higher education institutions. In other words, there is an urgent necessity to examine the realities of teacher training institutions at the university classroom level. Thus, it is necessary to accumulate both attempts at and case studies on such endeavours at the classroom level in universities for teacher education in a developing Asian country such as Indonesia.

Purpose of the research

This paper therefore aims to examine a case of a lesson study (LS) in the Faculty of Mathematics and Science (FMIPA) of Yogyakarta State University (UNY) in Indonesia. LS is a method of case analysis on the practice of lessons to aid the professional development of teachers. Similar to classroom action research (CAR), LS is composed of the observation of the real practice of lessons by observers, including collegial teachers or people from external organisations such as university faculty members, and reflecting on the practices with all the participants in the observation and the teachers who opened the lesson for observation (Inagaki and Sato 1996). More concretely, it aims to identify and analyse existing issues and problems in order to promote LS as a method for improving the quality of faculty education. Further details regarding the difference between LS and AR will be provided under the heading 'Prior experiences of lesson study' in Section 3, i.e. 'Case description'.

To achieve this goal, this paper is divided into five sections. Following the introduction, the next section describes the method of analysis. Thereafter, the third section presents the case description. Section 4 provides an analysis of thematic issues, and the Section 5 presents the conclusions.

Methods

Data collection

Eisuke Saito visited FMIPA from 6–10 March 2006 to participate in their LS programme. Three of the authors were involved from the very beginning of this project – from February 2006 onwards – as members of the faculty. The first author observed four lessons in March 2006, while the second and third authors observed 50 lessons in all. Thereafter, the fourth author observed lessons 10 times. The number of students in a classroom varies from around 30 to 40. During that period, the authors conducted a series of interviews with the faculty

members and observed how LS was conducted at the university. They conducted additional interviews with students. Two interview sessions were held with students in February and March 2007, and the faculty members also participated as interviewees. The total number of student participants in the interviews was eight, and four students participated in each session. Each interview session lasted around 120 to 150 minutes. Eight faculty members participated in these sessions, and four of them attended each session.

Moreover, the faculty members maintained a record of the lessons observed by the group members on video, for future reference. For this research, the first author recorded the lessons on video in order to utilise them in the process of reflection, wherein every observer and faculty member whose lesson was observed expressed his/her opinions, and the first author explained the facts and evidences of the situation in the lessons, by using the video. The focus was on different aspects of student learning: the types of activities conducted and the types of non-verbal reactions, such as facial expressions, presented by them. This is because such evidence would help both the observed faculty members and the observers reflect on the lessons.

The lessons were recorded by Eisuke Saito from the front of the classrooms and not from the back. He had received training in video recording from two leading Japanese experts; the first expert was a professional video journalist who had produced a number of TV programmes on teachers and their lessons in Japan. This expert had also visited Indonesia to train her Indonesian counterparts under the Indonesian Mathematics and Science Teacher Education Project (IMSTEP) – a technical cooperation programme initiated by the Government of Indonesia and the Japan International Cooperation Agency (JICA) – and all the authors had enrolled for the courses offered by her. The point she emphasised was the need to focus on every single student, especially when they began to concentrate on learning. The other expert was a practitioner, a retired school principal, who had initiated LS with a focus on the reflection process by utilising video recordings. He emphasised focusing on students who had difficulty in coping with learning activities. Both the experts emphasised the importance of being sensitive enough to read students' facial expressions in order to understand their responses to learning contexts.

Method of analysis

The project employed the methodology of case study as an analytical method (Cohen, Manio, and Morrison 2000; Creswell 1998). In other words, it provides an in-depth description and interpretation of the cases obtained and the generalised lessons that were learnt. Therefore, the authors focused their analysis on the statements and observations pertaining to teachers' professional development.

Further, the issue of collaboration among the four authors should be discussed. Since the first author (Saito) worked outside Indonesia fairly frequently and the second author (Hawe) currently works in a region different from Yogyakarta, communication among the four members was a major problem. In order to overcome this limitation and to make the optimum use of time, the first author prepared a draft of the manuscript after clarifying the points to be emphasised through discussions with the remaining authors. Following this, he then sent the draft via e-mail to the other authors so that they could provide their comments and make the necessary corrections. Moreover, the first and second authors jointly planned the content of the interviews with faculty members and students, which the second and third authors conducted in February and March 2007. They then sent the results of the interviews to the first author via e-mail to receive his comments on them. After conducting a further additional interview, the first author included the results of these interviews in the analysis

and forwarded the revised manuscript to the remaining authors to review and finalise it after obtaining their consent on the contents of the manuscript.

Case description

Prior experiences of LS

The subject comprehension and pedagogical skills of Indonesian mathematics and science teachers are considered to be at a low level (Joni 2000). In order to change this situation, some universities and schools have begun to implement collaborative activities under the aegis of IMSTEP. The recipient institutions under IMSTEP were the Faculties of Mathematics and Science of UNY, the Indonesia University of Education (UPI) in Bandung and the State University of Malang (UM).

In 2001, these institutions introduced in-service teacher training programmes that were known as 'piloting activities' (PA) (Saito, Sumar, et al. 2006; Saito, Harun, et al. 2006; Saito et al. 2007). PA involves school teachers and faculty members jointly developing lesson plans, implementing these plans into practice in classrooms and then reflecting on the lessons. The programmes were targeted at both junior and senior high schools; each university chose two junior and two senior high schools as partners. From 2004 to 2005, UPI targeted grade 1, UNY was in charge of grade 2 and UM focused on grade 3 at both the lower and upper levels of secondary education.

Although PA were conducted for several years, there were some difficulties and problems. In particular, the quality and depth of observation and reflection were unsatisfactory (Saito, Harun, et al. 2006; Saito et al. 2007). In addition, there was a general lack of engagement by and involvement of school managers and colleagues in other subjects in the schools with regard to PA, although both the university faculty members and PA teachers were intensely involved in the process. Consequently, despite having a strong impact on the selected PA teachers in terms of improving teaching skills, the effects of the PA did not percolate to the other colleagues in their schools. From the viewpoint of improving the educational quality in all the schools, there was an urgent need to obtain collegial involvement that would transcend the boundaries of the subjects (Saito, Sumar, et al. 2006a).

Therefore, JICA experts introduced the framework of LS to their Indonesian counterparts. These experts examined Japanese experiences and resources pertaining to LS, particularly from a student-focused perspective. This is because they believed that such an approach in observation and reflection would address the problems of quality identified during these activities. Moreover, JICA provided intensive exposure to the majority of its counterpart faculty members in Japan and motivated them to recognise the necessity of maintaining a careful watch on the teaching and learning processes. Therefore, JICA experts attempted to bring about conceptual changes among the faculty members with regard to teaching practices.

Despite many similarities, the difference between AR and LS lies in the nature of the activities themselves. AR is a research activity on teaching conducted by teachers or scholars, because many authors emphasise the importance of writing an article at the end of an AR cycle (Mertler 2006). LS tends to be defined as encompassing 'a large family of instructional improvement strategies, a part of which involves the observation of live classroom lessons by a group of teachers who collect data on teaching and learning and collaboratively analyse it' (Lewis, Perry, and Murata 2006, 3). Some researchers comment further on the collaborative nature of planning, such as 'bringing together groups of teachers to discuss lessons that they have firstly jointly planned in great detail and then observed as they unfolded in actual classrooms' (Fernandez 2002, 393). To be more precise, in the case of

the US, the process of LS tends to be introduced as a Plan–Do–See cycle, which constitutes: (1) selecting goals; (2) meticulous planning; (3) demonstration and observation; (4) reflection and modification of lesson plan; and (5) writing an LS report (Fernandez 2002). This type of approach to begin with the joint planning of lessons in groups and to finish LS with writing reports is conventional and typical in Japan too (Inagaki and Sato 1996; Murase 2007). If LS is understood in this context, few differences would exist between AR and LS (Wiburg and Brown 2007, 21).

However, there is an emerging approach of LS, particularly in the type of LS for the learning community (Inagaki and Sato 1996; Murase 2007; Ose and Sato 2000; Sato 2006; Sato and Sato 2003), the goal of which is to create a community of discourse on lesson practices within schools for teachers' mutual learning. That is, LS is a central daily activity for schools, where all the teachers in a school should be involved in observation and reflection. This approach lacks a defined formality of activities, as shown above: teachers simply get together to observe and reflect on lessons – nothing more than that. Neither joint lesson planning nor the revision of those plans is a requirement in this approach. Even writing a report, which is an essential component of academic activity, is not an essential part of this approach. Inagaki and Sato (1996) highlight the problems in the conventional approach: although many teachers spend a lot of time completing reports on their practices, few such reports tend to be read. However, there is a requirement in the approach for the learning community to practice LS around 100 times a year in schools in total. The aim of this requirement is to enable various interpretations and analyses based on the evidences of and facts about student learning. This implies a shift from the improvement of lessons by revising lesson plans to improvement by accumulating tacit knowledge obtained from discourses in the reflection process (Murase 2007).

Perspectives within the author team for this paper also need some discussion. Eisuke Saito has been involved in IMSTEP to promote LS in PA, particularly based on the approach of LS for the learning community. He attempted to share this experience with his Indonesian colleagues; however, many hardships and difficulties have been encountered, as reported by Saito, Harun, et al. (2006b) and Saito et al. (2007). Next, focusing on the remaining authors, Saito got them acquainted with and interested in this approach of LS; however, they were at the initial stages and were yet to deepen their practices and understanding of it. Moreover, with the exception of Eisuke Saito, all the authors opened their lessons for observation, as did the faculty members.

Reason for initiating reform through LS

The Ministry of National Education and JICA have jointly decided to conduct a new programme following the completion of IMSTEP, and the universities will contribute to this new programme as resource organisations. LS will be the focus of the activities in this programme. However, the dean of UNY observed that the faculty's understanding of LS was still very poor and there was an urgent necessity to share the concepts and practices of LS with the faculty. In addition, the dean believed that LS would be a strong instrument for improving the quality of education and demonstrating to prospective teachers how collaboration with colleagues could be effective in developing their professional capacity.

Framework of implementation

The Faculty of Mathematics and Science of UNY has approximately 150 lecturers in four departments: mathematics, physics, chemistry and biology. In each department, the lecturers

are categorised into the first and second semester groups, and each group is further divided into four smaller groups. Thus, in all, there are 16 groups in each semester and a total number of 32 groups for the entire year. LS was conducted from February 2006, and every group was required to implement it either once or twice every week for each group.

The core lecturers selected from each group are responsible for engaging in LS throughout the year and leading the other lecturers. These core lecturers were selected on the basis of their teaching experience, age, personality and capacity. However, they need not have had any prior experience with PA. Nevertheless, even though the core lecturers were not necessarily experienced in PA, other lecturers with PA experiences were included in the same groups. Although the purpose of organising these groups was not to facilitate a transfer of knowledge or experience from the core lecturers to the others, the faculty managers attempted to create a mutual learning community. Therefore, the managers selected lecturers who were experienced, capable, flexible and keen on learning.

Each group had four to six members from the same department, and observation and reflection were undertaken within each group. The group members chose three topics for LS. Each group selected an individual to open the lessons, and it was possible that either the same or a different lecturer might have opened the lessons for observation and reflection.

Analysis

Attempting conceptual change

The case of FMIPA at UNY is unique because the university initiated LS without the appropriate knowledge and understanding of it. Despite their limited understanding, the managers decided to begin conducting LS by the faculty themselves, targeting all the lecturers in the faculty in order to promote reform in teaching and learning. As Hutchings (1996) points out, the involvement and review of faculty peers is necessary since teaching is extremely difficult if staff are expected to learn on their own. Presently, although the UNY faculty has been struggling with the implementation of LS, this sense of difficulty and the necessity for sharing experiences have in themselves assisted in improving the quality of teaching, as discussed in detail later.

Moreover, this attempt would lead to breaking the asymmetrical relationship between universities and schools (Saito et al. 2007; Sato 1999). Although schools or their teachers are not directly involved in LS at the university level, merely conducting LS implies that university lecturers are not necessarily perfect or eminent. Instead, the initiation of LS in universities indicates their realisation of their imperfections, and this realisation developed further through the practice of LS and their exposure to schools. Faculty managers realised that they needed to increase their learning. Prior experiences should not be considered as failures but should be seen as achievements that can be used to change their conception of lectures.

Teaching and learning processes

When Eisuke Saito observed the lessons in 2006, the lecturers had employed didactic lectures. Students seemed to be patient, maintained silence and concentrated on the lecture. Yet, although the lectures continued, the students were generally permitted to consult with peers in case they had any difficulty in understanding some parts of the lessons. Occasionally, the lecturers allowed the students to freely and openly discuss the issues that were raised during the lecture. Moreover, there were opportunities to organise small group activities in the laboratory in order to conduct experiments and observations. However, it took 30 to 40 minutes before students were permitted to hold consultations or begin these group activities.

It was observed that the students' concentration level was good, and this was the case not only while they engaged in small group activities but also in didactic lecture-like situations. In particular, they were extremely attentive when their lecturers or peers began to speak. As Sato (2004) states, the competence to carefully listen to others is an important element in establishing a dialogue. This capacity of the students was remarkable and in sharp contrast to the lack of student concentration in Japanese mass-scaled universities (Shimada 1995).

Interestingly, however, the students also seemed to be permitted to hold quiet mutual and informal consultations. These appeared to function as quasi-pair or quasi-group activities that promoted a deeper understanding of the content being taught. Such informal consultations or whisperings are also frequently seen in public places in Indonesia (Shiraishi 1996). However, if these consultations were digressive and beyond the scope of the topic or content being taught, they would obstruct the teaching and learning processes. Nevertheless, since the consultations were generally pertaining to the topics and issues being taught, they helped the students clarify certain unclear points and obtain a deeper understanding, without disrupting the class. Nonetheless, since this behaviour was informal and spontaneous, it was difficult to ensure a common level of understanding among all the students and to give it the form of public scaffolding to include other students, without careful attention by the lecturers.

In the interviews conducted in early 2007, one year after the commencement of LS, all the faculty interviewees emphasised the introduction of group work activities. For example, one Physics Department faculty mentioned the following. This faculty member described how the team began to incline towards group work usage.

Lecturer: The subject I first taught using the lesson study approach was modern physics in the first semester of the year 2006/2007. The modern physics team consisted of five other faculties apart from me. That was my team in the lesson study process. We chose three topics for its implementation. In the first topic, we discussed issues related to Einstein's theory of relativity. We used the method of discussion and question-answers and then progressed to reflection. During reflection, we discovered that the negative factor observed in the class was that almost no student volunteered to ask questions during the lesson. Moreover, any motivation from the lecturer, proved ineffective in persuading them to ask questions during the first class meeting.

On observing this behaviour, we instructed students that every group had to ask at least one question during the lesson in the next (second) meeting. In the second meeting, students were again divided into groups and allocated a problem task for each group to discuss.

Students from each group had to explain their result to other groups. Since modern physics is a theoretical subject, which has several concepts concerning relativity and needs profound thinking, students have to discuss it in groups.

Paidi Hawe: Okay. Thank you. But I need to ask, 'Was it the decision of the team to use discussions during the lesson? What do you think was the reason behind conducting discussions during lessons? Please reply in brief.

Lecturer: It is because it was too difficult to teach modern physics using the classical approach.

We presumed that since all the subjects in our department are mostly taught in a classical manner – through oral lectures – since semester one, students easily understood the lessons. Moreover, the strategy was changed to discussions using a Jigsaw in the third meeting.

Since we observed the need to improve the results of the second meeting, the Jigsaw method was finally adopted for the third meeting. During the reflection, my team mostly agreed that the third meeting achieved the best results of our teaching.

It should be noted that, in this case, the systematic introduction of group work was decided upon because of the necessity to address a higher level of learning content. In many cases of the introduction of group work, as Sato (2006) mentions, referring to cases in both primary and junior high schools, if it is organised for superficial or easy tasks, it tends to end up in failures, such as stagnation in the deepening quality of learning. Moreover, in general, tasks in lessons have increasingly become problem-solving types. Although LS by itself does not necessarily specify the type of teaching and learning strategies to be adopted, the above remark shows that many ideas and attempts emerged through collaboration among faculty members. Another faculty member said, 'I felt that whoever opened his/her lessons to others for observation, s/he would try to perform better than usual'.

In accordance with the faculty members' changes, students also mentioned their changes. For example, one student stated the following:

> I attended the course for mathematical statistics, where the lecturer used the problem-solving approach for learning. As students, we experienced it to be different from the previous teaching approach. Usually, most lecturers had applied the classical approach of lectures and assignments. However, the lesson in this course began with dividing students into groups, where different tasks to be solved were provided. Students discussed in groups to determine the solutions. Here, we felt more confident in learning. Moreover, the resources used for solving the problems were not limited to only one book but included many other relevant references.

According to the interviewed students, the LS approach did have some impacts: first, an increase of interest in learning a subject; second, a closer relationship among students for a deeper understanding of lessons than before.

Regarding the first aspect, one student stated the following:

> I think we need it (group work based on the problem-solving approach) because when we only receive materials without any problems to solve, it does not appeal to us. Moreover, if we directly work on the problems in groups, we obtain more precise results.

These utterances show that the students became more interested in learning the subjects in the courses under LS. As the students emphasised, the lecturers changed the teaching methods from lectures to group work to encourage students to take initiatives themselves. It should be noted that LS does not necessarily designate a particular teaching and learning methodology. However, the lecturers reflected on their own past practices and organised more student-centred learning activities, under the framework of LS, as shown in the interview with the faculty member above. Then, this shift of the teaching styles seems to have led to another shift in the student learning approach from that on the surface to a deeper one (Trigwell, Prosser, and Tailor 1994; Trigwell, Prosser, and Waterhouse 1999).

Focusing on the second impact, one student mentioned the following:

> We discovered a considerable amount of new information and knowledge, which we had not yet realised, through discussions. I thought, 'Yes, my friends' ideas are correct'. We found problems and discussed them together to determine the solutions to them … The relationship among students became stronger than before and some friends even visited their friends' dormitories although they had never done so before. We explained things to each other through discussions so that we could understand more about the lesson, and we also became closer friends. I can say that it is very exciting to learn the lesson materials in an informal way such as a discussion.

The impacts mentioned above match with those mentioned in the previous literature on the positive effects of group learning, such as a stronger human relationship among learners

as well as higher motivation to learn (Johnson, Johnson, and Holubec 1993; Kohn 1992; Sato 2006).

Observation

Whenever the authors participated in the classes as observers, the remaining group members visited the classrooms in order to observe their colleagues. This was undertaken as determined by the faculty managers, and it can be stated that one of the goals of the programme has definitely been achieved.

However, it should be noted that there exist varied opinions among the faculty members with regard to how to observe lessons. Probably, this is not necessarily confined to mere points on the style of observation; however, it proceeds to an issue of views on the teaching and learning process: whether they prioritise following the steps of teaching models, or ensuring every single student's understanding of the lessons. Therefore, the observation styles differ from group to group, although the faculty managers guided other faculty members to focus their observations on student learning. The JICA education experts, including the first author, also emphasised this point during IMSTEP. The programme after IMSTEP will target increasing the practice of LS in other districts; the faculty members' ability to observe the teaching and learning processes is crucial in order to gauge the success of the new programme. Nevertheless, there exist differences in the quality of teachers' observations of the students' activities, which will be examined below.

Some groups tend to be seated at the back of the class. Consequently, it is extremely difficult to gauge the students' non-verbal reactions to the lecture; moreover, these groups primarily focus on the lecturer's teaching behaviour. In such a case, the video recording by faculty members merely includes students' utterances and writings on the blackboard. As mentioned by one lecturer, the interest or belief of many lecturers in LS appears to be centred on the methodology to be adopted for teaching:

> Therefore, it will be beneficial to know the advantages and weaknesses of our teaching style as well as the solutions offered by other lecture approaches … The inputs should include views on the supporting media, because we think that it is still difficult for us to obtain appropriate media for our teaching.

Additionally, such views from lecturers would affect the viewpoints of some student participants in the lessons under LS. Since their focus and interest is on the material aspects, such as media, rather than on how students learn, students seem to be adversely affected as well as keenly interested in materials. One of the student interviewees remarked the following:

> Lessons under LS now make me have a future dream. I would like to be a teacher after my graduation. I would love to create new models for teaching, such as teaching media or demonstration kits, for my class in future.

Another student in the interview mentioned the following:

> Well, when I become a teacher … whenever I understand the LS class, I would seek information about the teaching method and teaching media used by the lecturer, so that I can teach as the lecturer did to present the material to students.

The authors are seriously concerned about a possible misunderstanding on the LS in the faculty, including both lecturers and students. Without special attention by managers and

coordinators, the practice of LS may easily lead them to viewing LS only with reference to materials in lessons, despite its emphasis on reflection on student learning (Inagaki and Sato 1996; Murase 2007; Sato 2006).

In contrast, other groups tend to be seated and observe from the front or window-side of the classroom. By doing so, they are able to observe the students' learning situation. Nevertheless, there are some observers among these who tend to focus on the lecturer's behaviours. However, it is considerably easier for these observers to notice even the small and subtle reactions of the students. Thus, according to the head of the Mathematics Department, the viewpoints of observation would change in the LS in their department. The department head stated that observers would observe lessons focusing on student learning and they would be supposed to comment on that aspect in reflection. This is a novel initiative and it would take considerable time for lecturers in mathematics to get accustomed to such observation and to understand the need for observing lessons from this perspective. However, this attempt and trial is significant in terms of deepening recognition with respect to lessons. This attempt requires further attention and examination for future development.

This difference in the observation style indicates the strong necessity for further efforts by the faculty managers to explain the importance of understanding student learning in LS. Although IMSTEP and faculty managers attempted to inform the faculty members about its importance, only a few of them displayed such an understanding. As Inagaki and Sato (1996) highlighted, while conducting LS, it is important to observe student learning and not focus solely on the performance of the teachers. This was stated with a special reference to primary and secondary education. With regard to higher education, Trigwell, Prosser, and Waterhouse (1999) state that the students of student-focused teachers are more likely to adopt the deep approach rather than the surface approach, leading to superior learning outcomes. This implies the necessity for the observers conducting LS at the higher education level to focus on both the performances of the teachers as well as student learning.

Reflection

The groups also differ in terms of the types of discussions during reflection. In other words, based on the types of discussions, these groups differ in terms of being 'evaluation-minded' and 'learning-minded' groups. Evaluation-minded groups tend to undertake reflection in order to identify the strengths and weaknesses of the observed teaching methods, while usually focusing on the weaknesses. On the other hand, learning-minded groups tend to share the lessons learnt, particularly their learning from the observed teaching.

In reflection, the evaluation-minded groups have a tendency to mainly discuss the teaching approach adopted by the observed teacher. The discussions tend to become evaluative, and in many cases, very critical (see Example 1). In addition, the evaluation-minded groups tend to provide a positive evaluation either in the initial or concluding remarks. Usually, such remarks are very general, and on certain occasions, one of the authors suspected that the observers 'praised' the observed teachers' teaching methods on the surface in order to avoid any kind of conflict with them. However, if the observed teaching was really good, the observers should be able to provide more detailed information, particularly regarding specific aspects that impressed or attracted them. Nevertheless, the evaluation-minded observers seldom provide such detailed positive comments.

Example 1. Evaluation-minded group

Lecturer A: Today, I thought that your (the observed lecturer's) teaching was good. However, I also noticed that it would not be easy to innovate style of learning.

The organisation of the classroom arrangement was not good, and in my opinion, this was the reason for the difficulties in communication between you and the students.
Moreover, you posed questions insistently, and then, the students gradually began to discuss their ideas. The teacher should not be the one to speak first and instead should permit the students to do so. Thus, the students should learn spontaneously and voluntarily. The teaching today lacked such activities.
In contrast, you preferred that the students listen to you first. I think that you should set aside some time for the students to talk and understand the topic being discussed.

Lecturer B: I think that you should reward the students. These rewards need not necessarily be prizes, but maybe in the form of additional credit points. Further, there were many students who could not understand the structural formulas. You can probably ask the students to study at home before coming to class. You should be more careful with regard to the students' level of understanding.
Thirdly, your manner of teaching was good.

Lecturer C: You seemed to force the students to listen to you. In other words, those who could not understand had to take notes and review them at home. Ideally, you should let the students feel free to pose questions. You did not care about whether or not the students really understood what was being taught.
Even if there were a reward system, only those who can respond would benefit from it. Therefore, it would be better to think about different approaches that could be adopted in order to encourage those students who are unwilling to speak before the class.

It should be noted that even though some of the observers describe themselves as constructivists or seem to discuss student learning, it does not necessarily imply that they tend to focus their observations on students' learning process. In some cases, there were remarks on student learning, particularly regarding their limited understanding, for example, lecturer B stated that 'there were many students who did not understand the structural formulas'. Nonetheless, this group seldom provides any concrete evidence based on facts observed during the process but provides very generalised remarks on the students. Additionally, a majority of their remarks on student learning have a strong tendency to be negative. For instance, in the above remark, rather than focusing on the positive aspects or the concentration of the students, Lecturer B points out the students' difficulty in understanding the structural formulas. The perspective towards the observed teaching is evaluative, mainly focusing on problems and shortcomings. In addition, since they passed a critical judgement on the students' understanding in their remarks, they should have had detailed evidences for such comments. To obtain such detailed evidences, they should have carefully observed student learning by standing to capture even small changes in students' verbal and non-verbal actions in various corners in the classroom. However, throughout the observation, the observers never stood up to observe how the students learned. Therefore, it is difficult to identify the evidential basis of such remarks; rather, it is suspected that such remarks are the product of some over-generalisation or bias against student learning in the observed teaching.

On the other hand, compared with the approach of the evaluation-minded groups, the learning-minded groups tended to adopt a different approach during the reflection on the observed teaching. As pointed out by Wood and Millichamp (2000), these groups spoke of a more playful and light atmosphere. There is a warm attitude that is more appreciative of the efforts and initiatives of their colleagues. Thus, there is an atmosphere of collegiality through mutual observation and reflection of the teaching (Barth 1990; Ose and Sato 2000, 2003; Sato and Sato 2003). Usually, it takes a few months, or sometimes years, to develop such a relationship at the level of the entire institution (Ose and Sato 2000, 2003; Sato and

Sato 2003). In the case of this study, the number of participants per group was limited to five or six lecturers from the same department. This could be the reason why some of the groups were able to develop such a relationship in a short period of time. Moreover, since prior relationships existed among the lecturers, it would have been easier for them to develop greater collegiality.

However, there certainly exists connoisseurship in the learning-minded groups. Learning-mindedness does not necessarily imply that these groups did not present their concerns or provide critical comments in their observations. In fact, the content of their utterances was not very different from that of the evaluation-minded groups.

Example 2. Learning-minded group

Lecturer D: Overall, your (the observed lecturer's) teaching was very good. This time, in particular, you utilised various types of media, such as audio-visual media and microscopes. However, I have one question: how effective is it to adopt such an approach in ordinary, daily teaching? What is the general opinion in this regard? Since today's teaching was a trial, it does not matter as much. However, if we adopt this method in daily teaching, it may be very time consuming. We have to be efficient in terms of our schedules and try to save time. What would everybody think? I would appreciate your view on this issue.
Further, in the group activities, the students were asked to deal with the tasks by themselves. Yet, can we follow the same method as we did previously? As we saw, the students were only engrossed in watching the figures and pictures of the microscope on the TV, and they did not participate in their own tasks.
Moreover, I was and am not so sure the extent to which the students understood today's teaching. There should probably be some time reserved for refining the strategies for explanations.
Additionally, I was not entirely sure whether the worksheets provided today were necessary. Were they really needed?

Lecturer E: You provided your explanations to the students by referring to the worksheet; however, I suspect that there was a lack of autonomy with regard to the groups. It was such a precious opportunity for them to conduct the observation today.

Lecturer F: There seems to be a gap or a lack of consistency between student activities and your explanations. While using the dummy models, the students were paying attention to the water transportation pipes in the leaves; however, they did not care about these pipes while handling real leaves.

Here, it is important to note that Lecturer F focused on the difference between the apparent purpose of the teaching and the students' behaviours. Although the transcriptions of the evaluation-minded groups included remarks on the students' lack of understanding, the remark by Lecturer F addresses student learning more clearly. Lecturers D and F, in particular, were participating in the teaching as the teaching team's members. That is, they assisted the lecturer and the students during the teaching. This highlights a clear-cut difference between the two groups. Rather than being mere 'objective' observers, the members of the learning-minded groups shared their time and participated in the teaching along with the lecturer and the students. Inagaki and Sato (1996) stress the importance of observers having the sense to appreciate the sharing of time, difficulty and pleasure with teachers and learners. Therefore, it should be stated that lecturers D and F seemed to have had qualitatively richer experiences and perceptions than the members of the above-mentioned evaluation-minded group.

Nonetheless, even with regard to the learning-minded group, it is more desirable to have a deeper discussion on student learning, while appreciating the diversity in students' ideas and findings, by referring to individual students in detail. Holding such discussions will deepen the lecturers' professional knowledge on nurturing deeper student learning.

Lecturers' appreciation of students' learning will result in the latter's feeling accepted by the lecturers, thus increasing their motivation to learn. Thus, it is important for the lecturers to begin with appreciating students' learning in order to increase their capacity to learn and be creative.

Management of LS

In order for LS to be thoroughly entrenched in the faculty's culture and to create an atmosphere of collegiality, sincere and actual participation of the dean and vice deans are essential, as seen in the Japanese schools' cases (Ose and Sato 2000, 2003; Sato and Sato 2003). This is because the leader is the most responsible person to ensure that every single student has the opportunity to learn (Sato 2006, 2007). However, the leaders in FMIPA of UNY do not seem to have that recognition. Thus far, two coordinators with prior experience in intensive conducting of LS or AR from the management level have been appointed to conduct LS. However, due to their busy schedules, the dean and vice deans were not regularly present during the LS activities as other ordinary faculty members were. Thus, it is important that the dean and vice deans increase their involvement in the LS activities.

Moreover, there should be discussions on compartmentalisation in conducting LS in FMIPA. As described earlier, at present, LS has been conducted within the same department, and the department has been further divided into smaller groups. Thus far, the objective of the LS activities in UNY was to accustom the lecturers to LS. However, in the future, the sharing of ideas and experiences across different departments will become a necessity. This is because if the lecturers work collaboratively on improving teaching and programme designs through LS, there will be greater opportunities for organisational and personal learning (Hutchings 1996; Knight and Trowler 2000). In addition, it is necessary to avoid the risk of lecturers feeling isolated in their respective departments (Knight and Trowler 2000), by organising LS beyond the departments.

Furthermore, as of March 2007, financial support towards LS has been discontinued. Due to this, many of the faculty members appear to have discontinued LS altogether. However, their complaints clearly illustrate some of their misconceptions about LS. The faculty members tended to focus on preparing lessons using the special materials to be observed. However, as Inagaki and Sato (1996) mention, the most important part of LS is reflection: since participants should learn from the reality of student learning, and many faculty members have not yet noticed this. It should be emphasised that LS can be conducted as a daily activity, without spending a significant amount of money.

Conclusion

This paper aimed to analyse the various issues and problems in promoting LS as a method to improve the quality of faculty education in Indonesian universities, based on the case of UNY. As described above, there are five issues. First, the UNY case was based on the experiences gained while working with PA schools. The faculty admitted its ignorance of LS and attempted to further understand it. This indicates the beginning of a radical conceptual change in teaching at UNY.

Second, turning to the teaching and learning process, the lecturers tended to employ didactic lectures in March 2006. Yet, students were permitted during lessons to informally consult with each other when they encountered difficulty in understanding the content, as quasi-pairs or quasi-groups. Then, in 2007, more faculty members became inclined to introduce group activities and some of them did so to address a higher level of learning content.

In response to such changes in the faculty members, the students changed themselves, too, increasing their interest in learning and developing a closer relationship with other students.

Third, with regard to the observation of lessons, despite the faculty managers' emphasis on an importance of observing student learning, many of the faculty members tended to focus on the teacher and teaching methods. This tendency to focus on teaching methodology leads both faculty members and students to pay special attention to the materials used in lessons only. However, originally, the most important point in LS is reflection on student learning. The faculty managers should ensure understanding by the faculty members on this point.

Fourth, turning to reflection, faculty groups can be divided into two types, based on the types of discourse in reflection: evaluation-minded groups and learning-minded groups. Evaluation-minded groups tend to mainly discuss the teaching approach adopted by the observed lecturers and their discussions are inclined to be very critical. On the other hand, learning-minded groups tend to appreciate each other's observed lessons and to deepen collegiality as a result. However, it is necessary for both to sharpen their views on student learning.

Fifth, in terms of the management of LS, the sincere real participation of the dean and vice deans is essential despite their regular absence due to their busy schedules. Moreover, by dividing the lecturers into smaller groups, LS practice might exacerbate the faculty's sense of compartmentalisation. Furthermore, the faculty members tended to focus on preparing lessons using special materials, not on how to reflect on student learning. The managers should make efforts to gradually change such views of faculty members.

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