Learning from Japanese Lesson Study in Southern Illinois

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From February 2002 through November 2002, Laurie and I worked with a group of 17 elementary teachers and four math advisors using a version of Japanese Lesson Study for professional development in four school districts in Southern Illinois. Southern Illinois University Edwardsville (SIUE) was part of a consortium of Illinois universities who received a grant to explore lesson study from the Illinois State Board of Education. We have previously reported (Taylor & Puchner, 2002) that participating teachers had found the experience motivating and beneficial. In this paper, we want to share some additional features of the groups’ experiences with lesson study. Following a description of Lesson Study, we will organize comments about key happenings for our Illinois lesson study groups under the main steps of the lesson study process, which allows us to simultaneously describe the process and report on the groups’ responses to the process.

What Is Lesson Study in Japan?

Lesson study is the centerpiece of Japanese elementary teachers’ professional development (Lewis, 2000). Teachers take part in lesson studies within a school, across a district, or in large public demonstration lessons in Japan. Three of our Illinois groups were within schools and one was across two districts. A lesson study involves a group of 3-5 teachers collaboratively researching and planning a lesson, teaching the research lesson, and then discussing the results in a debriefing session (Lewis & Tsuchida, 1998; Stigler & Hiebert, 1999). The purpose is to study and think about all aspects of teaching and learning. Many useful resources now exist for educators wishing to begin their own lesson study groups (Fernandez & Chokshi, 2002; Lewis, 2002).

Setting Up Lesson Study Groups

Seventeen teachers took part in the project (four groups each comprising four to five teachers); these teachers taught in traditional urban, suburban and rural settings. After making an initial contact via e-mail, and providing a packet of directions and resources to each group member, we (project facilitators Ann and Laurie) attended initial teacher meetings at school sites in March 2002 to help clarify the lesson study process. We also provided a math advisor (county/district math coordinator or SIUE mathematics department faculty member) to make occasional visits to the meetings to provide mathematical support, and then to attend the teaching of the research lesson and the debriefing.

Each of the four lesson study groups had different levels of knowledge and experience about lesson study, as some group members had read about and completed a previous lesson study, while others knew nothing about the process. Table 1 summarizes the teachers’ grade

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levels, prior lesson study experience, and lesson topics.

The groups also had different motivations at the outset. The relatively experienced Labelville group recalled their first experience of lesson study two years earlier during a graduate math methods class with Ann: “We felt intimidated, defensive, frustrated.” In the class they had studied Japanese lesson study and also read how Chinese teachers had a more profound understanding of elementary mathematics than US teachers (Ma, 1999). When Ann assigned them a lesson study project for the course back in 2000, their primary goal was to prove this research wrong. By March 2002, as grant participants, they were humble and enthusiastic converts to the process (Taylor, Anderson, Meyer, Wagner, & West, 2002; Taylor & Puchner, 2002), happy to receive the support of a small stipend ($500), and the benefit of substitute teachers for the day of the research lesson teaching and debriefing. By contrast, the Ellstown group knew nothing about lesson study. Gillian of Ellstown describes her initial response as “skeptical” of the value of spending so much time planning just one lesson. Nonetheless, with the enthusiastic lead of a county math advisor they all knew, the four Ellstown teachers followed the planning process.

Choosing a Topic

In Japan a topic for the lesson study is chosen by the lesson study group, but it links to an overarching national, district, or school goal. (For example, teachers may work on a lesson study topic of subtraction with regrouping as part of a larger goal of improving children’s independent problem-solving.) We found that selecting this overarching goal was very hard for the groups, as they were not used to going through the process of researching together as a district or school to identify goals, nor to using large goals to guide lesson planning decisions.

The experience of the Gresham group, who comprised members of a graduate class taught by Ann, illustrates the potential usefulness of goal development. Ann’s facilitation (as course instructor) is one of the reasons they developed a goal while some of the other groups did not. Even though the development of their goal was challenging, (even with Ann’s help), it proved to be a useful reference point later on as the group began to worry about their choice of topic and the capability of their students. Half way through their lesson planning they wondered whether they should have chosen to do fractions with first graders, as they weren’t sure the children were capable. Referring back to their overarching goal of “Developing adaptive reasoners with the capacity for logical thought, reflection, explanation, and justification” helped them to recognize that it didn’t matter that much whether their students got all the right answers, as long as thinking and reasoning occurred. As they wrote in their planning meeting notes: “We need to keep in mind our intentions. Our overarching goal is to develop adaptive reasoners.” They also shifted their own emphasis from getting right answers from students to becoming inquirers themselves.

Planning a Research Lesson

The teacher groups spent 10-15 hours planning their lessons, and all of the teachers found this work to be extremely valuable. Although interviews with teachers and observations of meetings indicate that the most important part of the lesson planning was the collaboration and discussion that went on among the teachers, each group did produce a detailed written lesson plan. We had encouraged the teachers to write the lesson using a specific lesson study format (used by Japanese teachers)
that situates the lesson within the larger framework of the unit of study, and describes how the key concepts may be developed in different grades and across a series of lessons. To aid them in the process, we had provided the groups with a multiple column lesson plan format that includes: teacher activities and questions; anticipated student responses in terms of all possible mathematical ideas; and teacher responses to these mathematical ideas. However, only the Ellstown group, strongly supported by the county math advisor, produced this level of completeness in their written plan. A main issue was lack of time, because just talking about one lesson took so long. It is possible that some US teachers will need several rounds of lesson studies before they begin to include such complete attention to breadth and depth in their planning.

Another issue of note pertaining to the planning of the lesson were the very different responses of the groups to the role of an outside math advisor. The Labelville group’s advisor only participated in one meeting, which worked fine for that experienced group. Gresham worked together as part of Ann’s course, so she served as their advisor/instructor. In two of the schools, however, the outside advisors played a larger role, which interestingly was perceived positively by one group and negatively by the other. In Rose City, the advisor’s comments at one of the planning meetings were experienced by the teachers as harsh and critical of their work. These teachers needed to feel in charge of the whole process, setting their own agenda for what and when they wanted to learn. However, the teachers in Ellstown welcomed and encouraged the direct input of their advisor, appreciated her strong lead during their meetings, and responded positively to her critiques of their mathematical and pedagogical ideas. This suggests to us that lesson study advising can be a challenging business in the US. Teachers’ needs will vary from group to group, as will their own sense of how much they want advice from others. While we would still see a need for input from mathematical experts, the response of teachers to outside help may need to be carefully monitored, and lesson study facilitators should recognize that what works well for one group may not work for others.

Teaching the Lesson

Japanese teachers regard it as an honor to be the teacher of their group’s research lesson. In the US, however, teachers are not as accustomed to making their teaching public. The teachers designated by their peers to teach the research lesson in two of our groups described being very nervous about being observed by colleagues. One of the teachers in particular experienced this as almost debilitating, and refused to allow an additional visitor to observe her. Our research suggests that for some teachers the potential negative effects of being observed, an event that usually occurs in US schools in the context of an evaluation by an authority figure, should be taken seriously by lesson study planners.

While the teacher of the lesson is teaching, the prescribed role of the other group members is to observe and take detailed notes of what the children do and say during the lesson. The teachers in our groups all found it difficult not to behave as teacher-helpers during the research lesson. Prior experience with the Labelville group led us to emphasize the benefits for the teachers of acting as an observer rather than helper, and all of the teachers commented on how much information on student learning they gained from carefully watching and writing down what children did and said during the lesson. We recommend assigning each observer to take detailed notes on a
small group of students in the classroom, rather than suggesting that all observers attempt to watch the whole class.

**Debriefing and Learning From What Happened**

Immediately following the research lesson in Japan, teachers and observers meet to share feedback and offer detailed critiques of the lesson’s strengths and weaknesses. The aim is to understand what happened and to produce an informed revision of the lesson, which may be retaught. However, it should be emphasized that the purpose of lesson study is not to produce a perfect prepackaged lesson to share with others, but rather to learn about and improve teaching as part of a continuous process of professional development.

At the debriefings, all four lesson study groups expressed a deep sense of satisfaction, interest, and delight in the culminating experience of teaching the research lesson. A large part of this satisfaction was related to their observations of the students’ responses and mathematical learning. The Ellstown responses are particularly interesting, and reveal the power of lesson study for improving mathematics instruction. The school’s usual curriculum is from Saxon mathematics, which emphasizes procedural fluency and provides scripted lessons to prevent teachers making any changes to the set curriculum. The Ellstown group chose to focus their lesson study on teaching through open-ended problem-solving, a method the teacher had tried earlier in the year and “bombed” at completely. Gillian the lead teacher reflects on the group’s shock at how well the students responded to the research lesson:

I was completely surprised, I thought that we had come up with a lesson that was good and …I felt confident that I would be able to teach it the way we had planned... But I was never confident that my kids were going to get this [mathematical thinking]. I still had that huge doubt that my kids just may not understand this type of problem and being a low, low class like they were…[T]hen when it went so well I was just amazed,… I think I said “Who were those kids, they weren’t mine!” …They truly amazed me, and it just shows that when you have such good planning and thought process going into your lessons, how much it can affect your students and what you get from them, and even what you think of them… [W]hat I thought they were, was more of a reflection of what I was. And when I turned myself around, it turned them around.

In Gillian’s comments, we see three elements of how lesson study may impact teachers. First, Gillian saw a direct correlation between how much time and care the group spent planning lesson activities and the positive response of students, both behaviorally and mathematically. Second, Gillian noticed that students were capable of doing more mathematically than any of their teachers had previously thought. Third, she began to make a much more direct connection between teaching methods and student learning than she had previously, as she recognized that her teaching had been limiting students’ learning, and that problems she assumed lay with the students actually lay within herself. These are powerful lessons, and when built on with continued professional attention, they can result in significant changes in teaching methods.

During the lesson study debriefings it was also clear that Ann and Laurie needed to be very careful when offering critique about the lessons. Detailed observations or differences about the effectiveness of a
particular activity are frequently heard as personal criticism. In one specific case, for example, the Rose City group was hoping their first grade students would invent the need to and actually begin to regroup numbers into tens in order to add 18 and 25. However, the teachers chose to use individual unifix cubes as a manipulative, thereby inadvertently removing any need for children to regroup because they could count on by ones or other numbers. The teachers did not notice this conceptual problem with their lesson, and we felt that it was inappropriate to make this a key point of the debriefing. This suggests to us that a) in the case of some teachers, until they are more familiar with and welcome a culture of critique, some mathematical and pedagogical issues may be best not raised by outsiders, and b) some teachers may be more open to hearing some forms of critique in written form after the debriefing. For example, carefully constructed written comments offered in table form after the process was over, and encouraging teacher responses to each of our interpretations, appear to have been effective for the groups in this project.

Conclusion

Our experience with lesson study indicates that this model of professional development can be an effective way for teachers to engage in a study of teaching and learning. We believe that our experience is especially promising since at the university level we took a relatively hands-off approach, such that teachers and/or other school district personnel took the lead. On the other hand, we also discovered that special attention may need to be given to certain aspects of the process that may be particularly difficult for some teachers, such as exposing one's teaching to others, and keeping larger curriculum goals in mind when planning lessons.

References


<table>
<thead>
<tr>
<th>Group</th>
<th>Grade Levels</th>
<th>Advisor</th>
<th>Lesson Grade</th>
<th>Lesson Goal</th>
<th>Research Lesson Topic &amp; Lesson Problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gresham</td>
<td>Grade 6</td>
<td>SIUE Ed Faculty</td>
<td>1st</td>
<td>“Adaptive reasoning – capacity for logical thought, reflection, explanation, and justification” (Adding it up, p. 116)</td>
<td>Ordering fractions by size: ( \frac{1}{4} ), ( \frac{1}{2} ), 1 ( \text{Miss Betty has a problem and she needs our help to solve her problem. She is making cookies; she needs } \frac{1}{2} \text{ cup of sugar, 1 cup of flour, and } \frac{1}{4} \text{ cup of chocolate chips. Miss Betty will use the ingredients in order from the smallest to the largest amount. What should she use first, next, and last?} )</td>
</tr>
<tr>
<td>Ellstown</td>
<td>Grade 4</td>
<td>County Math and Science Coordinator</td>
<td>4th</td>
<td>Individuals use critical and higher level thinking skills to solve open-ended problems</td>
<td>Open-ended problem solving Farmer Brown saw 40 heads in the barnyard, some were chickens and some were pigs. He counted 100 feet. How many of each animal did Farmer Brown see?</td>
</tr>
<tr>
<td>Rose City</td>
<td>Grade K</td>
<td>County Math Coordinator</td>
<td>1st</td>
<td>Active engagement of students</td>
<td>Addition with regrouping Mrs. Bateman and Mrs. Morgan need to buy soda for the A.R. party. Mrs. Bateman has 24 students. Mrs. Morgan has 18 students. How many sodas do we need?</td>
</tr>
<tr>
<td>Labelville</td>
<td>Grade 2</td>
<td>SIUE Math Ed Faculty</td>
<td>2nd</td>
<td>Teaching two step word problem</td>
<td>Division A South School 2nd grade class has been studying farm life. They will be taking a field trip to a farm. The class will be divided into 6 groups. Each group has 5 girls and 3 boys. How many more girls than boys are going?</td>
</tr>
</tbody>
</table>

Miss Betty has a problem and she needs our help to solve her problem. She is making cookies; she needs \( \frac{1}{2} \) cup of sugar, 1 cup of flour, and \( \frac{1}{4} \) cup of chocolate chips. Miss Betty will use the ingredients in order from the smallest to the largest amount. What should she use first, next, and last?