

Using the Japanese *Lesson Study* in Mathematics

What is *Lesson Study*?

Lesson Study is an ongoing, collaborative, professional development process that was developed in Japan. Many teachers in the United States and Canada are interested in this process, particularly in light of the TIMSS (Third International Mathematics and Science Study) results, which highlighted the advanced performance and deeper thinking in mathematics by Japanese students.

Many mathematics teachers are looking closely at the strategies and techniques of Japanese teachers to help them improve their teaching and their students' achievement in mathematics.

A key element of Japanese mathematics teachers' success is their process of *Lesson Study*. *Lesson Study* involves a group of teachers working together on a broad goal and developing lesson plans that are observed, analyzed, and revised. Their focus throughout this process is on improving student thinking and making their lessons more effective.

The *Lesson Study* Process

The basic *Lesson Study* process is as follows:

- **Choose a research theme.** A group of teachers works together to come up with a research theme. This theme is school-wide and focuses on a broad research question regarding their students that involves skills or attitudes they would like to foster. For example, a research theme may be to determine how to increase independent thinking in students in mathematics.
- **Focus the research.** The teachers select a goal and unit of study to focus on and research their students' abilities and needs within this unit of study. For example, they may select a unit on transformational geometry, and the goal of increasing students' abilities to independently apply transformations to concepts of congruence and similarity.
- **Create the lesson.** The teachers then select a lesson within the unit to develop, and follow an established lesson plan template. This template focuses on how the lesson fits within the broader school curriculum, linking the lesson topic and skills to previously learned content, and to content that will be learned in future grades. This lesson plan template also focuses on ways to assess student thinking during the lesson.
- **Teach and observe the lesson.** The lesson is taught by a member of the group and observed by the other members. The focus of the observation is on student thinking not on the teacher's abilities.
- **Discuss the lesson.** The group then gets together to discuss the lesson and their observations. This is usually done on the same day.
- **Revise the lesson.** Revisions are made to the lesson, based on their observations and analysis, and another member of the group is selected to teach the lesson again. The process of observation, discussion, and revision repeats.
- **Document the findings.** At the end of this process, the group produces a report that outlines what they learned in regards to their research theme and goal.

Lesson Study Cycle

Set Goals → Analyze and Plan → Teach and Observe → Discuss and Revise →
Teach and Observe → Discuss and Revise → Report on Goals

The length of this process varies, but it can take up to several years. The size of the group also varies, but typically involves four to six teachers, as well as an administrator and an outside expert. The group usually works on two or three lessons a year.

One of the best ways to think of *Lesson Study* is as a bridge. A bridge is formed by the teachers working together and collaborating, and a bridge is formed across the curriculum by looking at how lessons and skills interconnect across grades. The *Lesson Study* process thus helps to remove isolation—both in teachers working in isolation, and in skills being taught in isolation.

Overcoming Obstacles

Lesson Study may seem like an overwhelming process, one that requires considerable time and effort in an already overly busy schedule. However, those who undertake it find it to be an incredibly rewarding and beneficial process, well worth the time and effort.

With today's emphasis on improving student achievement and the growing awareness of the strong performance of Japanese students in mathematics, *Lesson Study* seems to be the right process at the right time.

The collaborative nature of *Lesson Study* helps strengthen relationships among teachers and improves teaching. The research focus of *Lesson Study* helps to professionalize teaching. And of course, the greatest reward of *Lesson Study* is the benefit that students gain by improving their mathematics performance and thinking.

Even with all the benefits, the process can still seem threatening. However, teachers just need to keep in mind that they are working together to improve student learning. Sharing a common goal can be quite empowering. It is also helpful for teachers to remember that the focus of the observations is on student thinking, not on their abilities. This can help lessen some anxiety.

Getting Started

It is best to start the *Lesson Study* process with a small group of interested teachers who volunteer to participate. If it is easier to find a group of interested teachers across grades or from different schools, this also can be a good way to start. A beginning group may want to simply follow some of the broad elements of the process rather than undertaking the complete process. Just having a group of teachers collaborate on a student-focused goal can be quite beneficial.

Likewise, developing a lesson together that looks at how the lesson goals and objectives fit within the broader curriculum across grades, and how student thinking can be assessed during the lesson, can also be very valuable.

Observing the lesson (remember: the focus is on student thinking, not the teacher's abilities) and getting together to talk about the observations, is of course, a powerful exercise that can produce great insight and improved instruction.

If a beginning group has the time and interest, it is important to continue the process by revising the lesson and having another teacher teach it and be observed. (It can be interesting to have another teacher teach your students. This experience can lead to valuable insight into your students' thinking, their strengths, and their weaknesses.)

As a new *Lesson Study* group, you may find it more manageable to follow only some of these steps, but hopefully, your group will be able to complete the cycle.

Lesson Study Cycle Steps

1. Select a broad goal, such as increasing your students' abilities to reason mathematically, or increasing their confidence in their mathematical abilities.
2. Select a unit to focus on and analyze the current abilities and needs of your student population.
3. Select a lesson to develop together, being sure to look at how the skills for that lesson fit in the continuum of skills across grades. Also think about how evidence of student thinking can be observed during the lesson.
4. Teach the lesson and observe it.
5. Get together to discuss and analyze the lesson.
6. After discussing your observations, work together to revise the lesson, and then have another teacher teach the lesson, then repeat the observation and discussion.

By going through this process, you will reap great rewards and become closer to your colleagues.

Gain Administrative Support

Of course, administrative support for undertaking *Lesson Study* is needed, but in light of the current emphasis on student achievement, and the awareness of Japanese students' success in mathematics, administrative support should be easily obtained. One place to start may be by referencing some of the school districts who are following the Lesson Study process, such as schools in Illinois and Connecticut.

Set Realistic Expectations

And finally, remember to set realistic expectations. Do not try to take on too much at the beginning. Remember that one of the elements of *Lesson Study* is that it is an ongoing process.

You can keep the process simple by focusing on these key actions:

- Collaborating
- Planning
- Teaching
- Observing
- Reflecting
- Revising