

in
this *issue*

RBS' interest in **lesson study** grew out of collaborative work with the U.S. Department of Education to disseminate data from the Third International Mathematics and Science Study (TIMSS). Delving deeper into TIMSS and related research, we met two key individuals—Harold Stevenson and Catherine Lewis—without whom our journey beyond TIMSS would not have led to lesson study. Our understanding evolved with the help of Clea Fernandez and Makoto Yoshida, who provided opportunities to observe lessons at the Greenwich Japanese School. But it has been primarily through our four-year relationship with Lynn Liptak and the staff at Paterson School 2 that we have learned up close about the challenges and rewards of “sticking with it” while continually refining our understanding of what **lesson study** offers.

by Patsy Wang-Iverson



A lesson study open house brings together a group of observers who record evidence of student thinking, as in this event in January at New Jersey's Paterson School 2.

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What is Lesson Study?

Think for a moment about what experience or influence has helped you grow the most as a teacher or administrator. Was it something that you did completely by yourself, or did it involve deeper connections with mentors and colleagues? Did it take place at your school over a long period of time? If so, keep reading. Lesson study may be for you.

Lesson study is a new term for the old truism that two minds are better than one. It challenges the status quo of teachers and their classrooms as islands—relatively unaware of events on other islands—with students floating in between.

In the lesson study model of professional development, teachers connect with one another, with

administrators and specialists, and even with other schools. All participants focus their energy on student learning in the classroom, and together they develop, implement, and refine the lesson being studied.

History of Success

While its practice in the United States is limited, lesson study has a long and well-documented history in Japan, where it is the most common form of teacher professional development.

Ironically, lesson study emerged in Japan as a grassroots movement of educators trying to replace lecturing with the Western philosophy of “child-centered teaching” and the problem-solving approach.

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Online Exclusives featuring
Makoto Yoshida, Catherine Lewis,
and Future Prospects for Lesson Study



What is...

Continued from Page 1

Derived from the Japanese word *jugyokenkyu*, the term "lesson study" was coined by Makoto Yoshida, president of Global Education Resources, who generously collaborated on this issue of RBS *Currents* (particularly on the lesson observation and debriefing guidelines within). It can also be translated in reverse as "research lesson," which indicates the level of scrutiny applied to individual lessons. Far from short-sighted, the intended impact of lesson study is school-wide, and it requires persistence and patience to reap its full benefits.

"The main contribution that the Japanese form of lesson study offers that is not already in the United States is school-wide professional development that is implemented in a systematic way," says Patsy Wang-Iverson, senior associate of RBS. She stresses that lesson study does not require additional funding to be

implemented, but it should not be attempted frivolously or without a supportive network of administrators and content experts.

Yoshida cautions that lesson study is not one lesson, as is commonly misunderstood, but the study of an entire curriculum unit, and how through the unit teachers can foster better student understanding.

Culture of Collaboration

The "performance piece" aspect of lesson study is the teaching of a lesson with students that is observed by other teachers. Surrounding this lesson is an intensive, collaborative effort by the study group to extract the best ideas in planning, reviewing, and revising the lesson. The entire process moves toward on a broad goal or vision of education developed by the school or study group to enhance their students' lives.

Before any lessons are planned, the school staff carefully analyzes its student population in order to select an appropriate, over-arching goal, such as facilitating students' independent thinking. Writing teams collaborate to use this goal in designing and mapping out one original lesson. As that lesson is taught, the non-teaching members and other observers participate as researchers by recording student reactions in order to document student thinking. This live observation sets the stage for an insightful critique session, which takes place the same day. With their findings, the team begins the cycle again, either by refining that lesson or by selecting a new topic to develop for the next lesson. A typical team might develop two lessons over the course of a school year.

Only two lessons? The real "lesson" of lesson study is not product, but process. It compels teachers to examine their own practice in depth, connects them with their students and their professional community, and inspires them to teach better every day.

Culture of Learning

In Japan, lesson study groups exist for all content areas. In the United States, lesson study has focused on mathematics and science, because interest in it was stimulated by data from the Third International Mathematics and Science Study. The TIMSS videotapes of Japanese mathematics classrooms were of particular inspiration to New Jersey's Paterson School 2, which has been a pioneer of lesson study in the U.S. for the last three years.

Teachers in Japan frequently observe lessons in other content areas, according to Wang-Iverson, because they use the process to better understand their students. "When you are able to observe your own students being taught by someone else," says Wang-Iverson, "you get a more concrete view of their learning and thinking."

If teachers improve their content knowledge and practice through lesson study, then it follows that their students will have greater opportunities to increase their understanding and improve their performance. For teachers, lesson study provides a dynamic means of sharing new content and teaching approaches. Perhaps just as important, it honors the central role of teachers.

Another indirect benefit of lesson study may be the "professionalization" of teaching. When teachers take time to study teaching, then students, parents, and the education community at large will take them more seriously.

If you are still wondering what lesson study is, think of it as a bridge. Built by schools, it provides an infrastructure for teachers to share and discover best practices in a deliberate and thoughtful manner. Some of those ideas may even come from the "island" right next door to yours.

Lesson study emerged in Japan as a grassroots movement to replace lecturing with the Western philosophy of child-centered teaching.

Lesson Study Brings Rewards and Challenges

By Wendy Buckwalter

To many teachers who experience lesson study, it is the kind of professional development that they've been waiting for. The collaborative process gives teachers the opportunity to share best practices, hone their curriculum, and anticipate and observe how students think. On another level, the process acknowledges teachers as professional, knowledgeable practitioners, whereas so many other professional development options are seen as "top-down."

Rewards

RBS Currents interviewed staff at several schools in the Mid-Atlantic region about their early efforts with implementing lesson study and learned about some of the rewards they are experiencing.

Opportunity to Collaborate.

Many teachers find the collaborative element to be a welcome change from teaching and planning in isolation. Andrew Goldberger, staff development teacher at Charles R. Drew Elementary in Silver Spring, MD, explains, "Lesson study gives teachers a terrific chance to collaborate, but more than usual, they can be on the same page about having not only developed the lesson together but also having seen the lesson taught. It gives the teachers a chance to observe, dwell on and talk about how children learn or don't learn. Teachers can also discuss the impact of planning decisions and make adjustments."

Applying Learnings to all Lesson Planning.

Several teachers indicated that through experiencing just one lesson study cycle, they learned new techniques and ways of thinking that they have

been applying to all of their lesson planning. They now think more carefully about student responses, rather than simply planning to meet the lesson's objectives. Patricia Jones, instructional facilitator at Lafayette Elementary in Lancaster, PA, says,

Conversations go deep into what is good mathematics instruction, down to the details of comparing the impact of using various manipulatives to teach the same concept."

- Instructional Specialist
Robin Bowden

"Lesson study presents teachers with an opportunity to study student misconceptions and use that information to make adjustments to a lesson. I have seen carry over from what we learned last year into teachers' day-to-day planning and lesson implementation this year."

Seeing Results. Through the process of collaborating and anticipating

various student responses, many teachers see tangible results in students' learning. "The students felt ownership over their learning. They took time to listen to how other students solved the problems. They made the connections between the manipulatives and the mathematical notations on their own," says Jackie Skandalis, a teacher at Drew Elementary.

Teachers as Professionals.

Lesson study allows teachers to be intimately involved in their own professional development. The classroom becomes the laboratory where teachers' experiences, observations, and expertise are tapped into to improve instruction. Robin Bowden, instructional specialist in Montgomery County, MD, explains, "One goal is to focus on getting teachers to talk to each other about good teaching and to have that talk at a professional level." And she's finding that teachers are very much enjoying the opportunity. "Conversations go deep into what is good mathematics instruction, down to the details of comparing the impact of using various manipulatives to teach the same concept."

Challenges

Like any effort to make significant and sustainable reform in teaching and learning, lesson study faces challenges.

What are the challenges to conducting lesson study in an American setting?

Time. Most readers are probably thinking, "Lesson study sounds great, but where is the time?" Finding the time for lesson study in an already jam-packed schedule can be daunting for a school or district that is considering lesson study. Schools in

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Rewards and challenges

Continued from Page 3

the Mid-Atlantic region have reported that while substitutes and release time can sometimes be used, the teachers often resort to holding collaboration meetings after school on their own time, implementing lesson study with only one grade level per year, conducting lesson study with only a handful of teachers, or completing only one lesson study cycle per year.

Every school is different, and it will certainly take time to sort out exactly how the lesson study model can work with the time constraints of American schools.

Support from the Administration. To undertake lesson study with the goal of improving teaching and learning requires the commitment of school-based and district-level administrators. Support for professional development, flexibility in scheduling, accountability for all staff, a willingness to look at the current curriculum, and a commitment to change will help lesson study take hold. The school and district administration also must understand that lesson study is not a “quick fix” for test scores, but rather a process that improves teaching and learning over time.

Several schools in our region have been starting lesson study on a very small scale, after learning about it through conferences and publications. While it has been an extremely rewarding process for the small groups of teachers implementing it, scaling up to a whole-school level will be difficult without administrative support from the school and district.

Breadth of Curriculum and Standards. Lesson study, as based on the Japanese model, demands a

concise curriculum in which topics can be studied in depth. In the U.S., the breadth of state and local standards, the demands of large curricula, and pressures to raise test scores quickly present challenges to districts that wish to implement lesson study. More concise curricular options, such

study will tend not to take hold among all staff members.

Finding Knowledgeable Others (see related article in this issue). A key element in Japanese lesson study that proposes a challenge to U.S. educators is the incorporation of

“knowledgeable others” into the lesson study process. Knowledgeable others, including teachers, administrators, and professors, can bring in critical observations about content issues, share the latest research, or help elucidate concepts within lessons.

But how do U.S. schools develop relationships with university-level educators who understand lesson study? In Japan, university relationships often begin while teachers are in their preservice years and extend to lesson study partnerships. In U.S. schools, we have not yet bridged the gap. Organizations focused on supporting lesson study in the U.S. are looking for ways to facilitate such relationships.

There are lessons to be learned in both the rewards and challenges of lesson study. In the words of Drew Elementary teacher Skandalis, “Lesson study allows you to take risks together and work collaboratively to overcome obstacles.” Lesson study practitioners in the U.S., such as those in the Mid-Atlantic region, are contributing to the process of adapting lesson study to the American education system.

If your school may be interested in implementing lesson study, see the “Resources” in this newsletter and contact RBS’ Patsy Wang-Iverson at wang@rbs.org.



as Singapore Math, are potential ways to mitigate this challenge.

Learning How to Observe, Critique, and Be Critiqued (see “Guidelines” in this issue). The notion of being observed by a room full of colleagues is not everyone’s idea of fun. It takes a lot of courage to volunteer to teach a lesson in front of fellow teachers, administrators, and university-level partners. Similarly, to offer constructive critiques—critiques that help everyone, hurt no one, and really get at the heart of student learning—is a skill that takes some work to develop. Without an openness to learning these skills, lesson

Facing the Challenges of Lesson Study

By Cynthia Sanchez

Lesson study has become an integral part of my teaching since my first introduction to the math study group at School 2 almost four years ago. The challenges I encountered were not just professional but personal ones as well.

I was only in my second year of teaching in the Paterson School System, and participating in a math study group seemed a bit overwhelming for a new teacher like myself. What sparked my interest was a fellow teacher who had participated the first year and said it helped with teaching math to her class. I figured I needed all the help I could get. Math has always come easy to me, and I've always been very sure of my math skills. But I soon realized after my first year that knowing math is one thing, but being able to teach it is another.

Lesson study has impacted my teaching

in many ways. Just going through the process, I was really able to step back and look at what and how I was teaching to my students.

While preparing the lessons, the group and I were very thoughtful. We looked at everything from how to introduce a new lesson to anticipated student responses, the use of the blackboard, manipulatives, and student engagement. This made me realize that there is more to teaching math than just opening a textbook and working on problems, or "spoon feeding" formulas just to get quick answers.

Since participating in lesson study, I reflect more on my teaching, and I am more open to asking for help. I am more aware of and observant of my students' learning or lack thereof. I'm trying to be more purposeful and to put



Given the opportunity, teacher Cynthia Sanchez takes flight and proves that she is a risk-taker.

more thought into approaching daily lessons in every subject. I also try not to just lecture and take out the textbook. I have tried to observe other teachers during my prep time at least once or twice a month, and I have asked my colleagues to come observe my classes.

If I were to compare the way I taught my first two years to the way I've been teaching since, I'd say I'm nowhere near the same teacher. I've grown from my lesson study experience and will continue to do so.

Sanchez is a 6th grade teacher at School 2 in Paterson, NJ.

Ridge High School Pilots Lesson Study

By Wendy Buckwalter

In Japan, lesson study is not used at the high school level. But that has not deterred Ridge High School in Basking Ridge, NJ. With the support of Marian Palumbo, Supervisor of Mathematics at Bernards Township Schools, three teachers have introduced lesson study to high school mathematics education.

Participating since the 2000-2001 school year, mathematics teachers Michele Kilpatrick and Danielle Lewis have seen a positive impact on teaching and learning.

Lewis is enthusiastic about the entire lesson study process: "The collaborative process helps you see things you couldn't see when planning by yourself, and the observation piece is so valuable for being able to anticipate students' responses." Now when planning lessons, Lewis takes extra time to consider the student response.

"Planning for students' responses not only creates a more engaging lesson, but it also serves all students better, from those with high needs who may struggle with math, to those who don't need as much attention. I take all possible responses into account," says Lewis. She has found the result to be that her students are exploring, thinking, and experimenting more, and that these processes help them learn more.

Kilpatrick agrees that the collaborative process allows teachers to bring new techniques into their regular repertoire. By handing out discovery questions, posting students' responses, and providing more handouts and hands-on activities, Kilpatrick's students are thinking more on their own, figuring out problems without being told how, and seeing the mathematical concepts more clearly.

In addition to gaining insight on a particular lesson or technique, Palumbo explains that the process of lesson study serves as professional development that extends beyond just one lesson. "It gives teachers a venue for reflection, and reflection is a key to successful teaching," says Palumbo.

How do these teachers find the time? The teachers participating in lesson study can earn staff development credit hours while engaging in lesson study during their after-school hours. The high school has a flexible enough schedule for teachers to observe lessons during prep periods and to use substitutes when necessary. Palumbo is hopeful that the middle school staff will also engage in lesson study in the future, and she continues to promote the process.

It's a Matter of Time: Scheduling Lesson Study at Paterson, NJ School 2

By Lynn Liptak

With salaries and benefits accounting for over 75 percent of the school budget, there is no question that staff time is the most valuable resource a school has to allocate. Our decision to implement lesson study, with a school day investment of 80 minutes to two hours each week per participant, was based on the interest and commitment of the teachers and the belief that deep changes in teaching and learning as they occur daily in the classroom are best achieved through collaborative, reflective professional development in the classroom context.

As with any investment, there is a down side and a risk factor. On the down side, when teachers are meeting during the school day, it is in lieu of teaching classes or tutoring students. There is also risk. Although lesson study is a highly successful means of professional development and instructional improvement in Japan, it is not easy to adapt the process in an American cultural setting. Results of adaptations of lesson study in the United States setting have yet to be analyzed, and dividends may be deferred. Our experience these past two and a half years, however, convinced us that lesson study is potentially a powerful vehicle for improving classroom instruction and thus, in our view, well worth the investment of time.

The following principles were considered in developing a lesson study schedule for School 2: If lesson study is going to become part of the school culture and conducted over a long period with a goal of gradual improvement, then time must be allocated during the school day. Lesson study has no chance of becoming a prevalent feature of the school culture if it is

conducted with a few enthusiastic volunteers working after school.

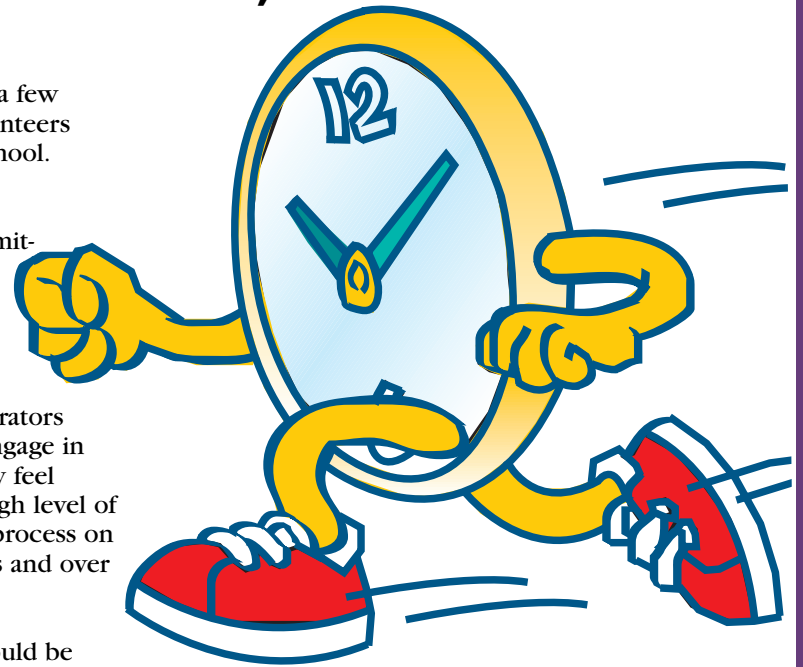
Time is one sure measure of commitment. When teachers see serious time committed to lesson study and the administrators taking time to engage in lesson study, they feel confident of a high level of support for the process on a day-to-day basis and over the long haul.

Lesson study should be scheduled by reallocating currently existing resources. In our school, it does not rely on "soft" money or the hiring of substitute teachers.

Quality instruction must be provided to students in the classroom while their teachers are engaged in lesson study.

Time for lesson study was thus built into the regular school day using non-classroom teachers. School 2 is a K-8 school in an urban district and thus qualifies for Title I funding. It has also benefited from the Abbott court decision, which mandated parity in funding for poor school districts. Funding from these sources has been used to hire English-as-a-second language teachers, reading tutors, and other non-classroom teachers. The district also provides special-area teachers (art, music, physical education, etc.), a guidance counselor, and other non-classroom staff. Therefore, it has been possible to pair each classroom teacher in grades 1 to 8 with a non-classroom partner teacher.

The partner teacher has contact with the class during the week by teaching during teacher preparation periods,



downsizing the class for mathematics or reading, or tutoring individual students. It is the responsibility of the partner teacher to know the students and become familiar with classroom routines. In the event of absence, the partner teacher helps to orient the substitute and assist, as needed, with the class. The partner teacher often teaches the class while the classroom teacher engages in lesson study. Students in grades 7 and 8 are in special area classes during the 80 minutes of lesson study time.

During our first two years, a group of 16 volunteers met each Monday from 1 p.m. to 3 p.m. to conduct lesson study in mathematics. During the first cycle, it was apparent that the two-hour weekly meeting was only "seed" time. Once we began to collaborate on lessons and test out ideas in the classroom, we did not wait until Monday to continue the process. E-mail communication and discussions before and after school, during lunch periods, and during preparation periods are common. Most importantly, these discussions

and observations are focussed on how our teaching impacts student learning. We know from research and our own observations that grade level meetings and school management team meetings rarely focus on the lessons that occur daily in the classrooms.

By the end of the second year, a chasm was developing between volunteer lesson study group members and non-participants. To address this, School 2 decided to go school-wide with lesson study. In August 2001, a three-day lesson study seminar was offered to all teachers. In September 2001, five lesson study groups (kindergarten, grades 1-2, grades 3-4, grades 5-6, and grades 7-8) were launched.

Now all classroom mathematics teachers (with the exception of one who opted not to participate) are scheduled from 80-105 minutes per week for lesson study. In grades 7-8, the science teacher also participates, and our first lesson study science

lesson is under development. In grades 5-8, special education teachers also participate. The mathematics facilitator attends all meetings and takes minutes, but the leadership of each group is shared among the participants.

While the teachers meet, classes are taught by a combination of partner teachers and special-area teachers. All student teachers attend lesson study with their cooperating teacher (not counted in number of teachers in the figure).

Additionally, the grade level teams meet for 40 minutes weekly to deal with issues apart from lesson study. Teachers, by contract, receive one 40-minute preparation period per day.

Like most good investments, we expect that the growth and dividends from the time we invest in lesson study will accrue gradually over a long period of time. Improving our teaching in depth is hard, time-consuming work, which needs to be

done collaboratively and in a supportive setting.

For too long, professional development time has been allocated to outside experts to “train” teachers rather than given to teachers to reflect collaboratively on their practice. We need to tap outside expertise; we need to improve our content and pedagogical knowledge. But the professional development process needs to occur in the context of our classrooms and be driven as an on-going activity by professional practitioners.

Lesson study—it’s about time.

Liptak is the principal of School 2 in Paterson, NJ.

Are you a time-saver too? E-mail editor@rbs.org with your ideas and strategies for allowing time for collaboration, and we will share them with our readers.

Scheduling Collaboration at School 2: School-Wide Lesson Study in Mathematics

Grade Levels	Teachers	Meeting Day/Time	Class Coverage
K	6	Tuesdays, 1:35—3 p.m.	Teaching Assistants
1-2	6	Wednesdays, 1:15—3 p.m.	Art, ESL, World Languages, Partner Teachers
3-4	5	Thursdays, 12:55—2:35 p.m.	Music, ESL, Art, Life Skills, Keyboarding, Partner Teachers
5-6	6	Tuesdays and Wednesdays 10:15—11:00 a.m.	Special Areas: Art, Music, Physical Education, Technology, Life Skills
7-8	5	Tuesdays, 1:35—3 p.m.	Special Areas

A Look at the Lesson

Special thanks go to the staff and students of Paterson, New Jersey's School 2—featured in these images—and to Makoto Yoshida for contributing photographs.



Using school-wide goals and objectives, a study group meets regularly to create a lesson. Here principal Lynn Liptak works alongside mathematics teachers.



Before the lesson is taught, observers gather to prepare for their role as researchers.



The moment of truth—will this carefully crafted lesson work? Here Neyda Evans asks first grader Amari Ross to explain what she has learned.



As students solve problems during the lesson, observers move in to record evidence of student thinking. This lesson took place in a gym to accommodate the large number of observers.

Study Process



***T**his science lesson involving lasers challenged students to demonstrate their understanding of the concept.*



***A**fter the lesson, the blackboard and other student work is preserved for reflection on the lesson's outcomes. Observers typically return to this room for the debriefing.*



***R**eflecting on the lesson he taught, Japanese master teacher Akibiko Takabashi begins the debriefing and initiates a conversation that carries on well after the lesson study day ends.*



***H**aving celebrated their work (not pictured here!), the study group convenes again to document what they have learned and to further refine this lesson and/or to begin planning a new one.*

Delaware Supports Lesson Study

by Janice Itzel, Teacher-on-Loan,
Delaware Department of Education

Lesson study is taking root across Delaware. Compelled by the findings in the book *The Teaching Gap* and by the progress made by School 2 in Paterson, NJ, the Delaware Department of Education designated lesson study as a Teacher-on-Loan project from 2000 to June 2002.

Funded primarily by the Christa McAuliffe Foundation, this project has four meaningful goals: to reach as many educators in Delaware as possible, to assist groups wishing to implement lesson study, to form partnerships among schools, and to reach a level of implementation statewide that insures continuity after the project has ended.

Currently, schools in five Delaware school districts are implementing lesson study: Christina in Newark; Indian River in Selbyville; Caesar Rodney in Camden; Cape Henlopen in Lewes; and Appoquinimink in Odessa. As with many reform efforts, the implementation of lesson study in Delaware's schools has grown by small, measured steps. This, I have learned, is a good thing; small steps are more likely to ensure the success and sustainability of any reform program, and that has been the case here. For lesson study—or any reform initiative to take hold—people need time to assimilate and integrate unfamiliar practices comfortably into their routines.

In my position as teacher-on-loan, I assist these districts by providing the “big picture” of lesson study within the state. One of the most useful tools in presenting lesson study concepts to teachers has been Catherine Lewis's videotape entitled *Can You Lift 100 Kilograms?*, in which Japanese teachers demonstrate lesson study (see the “Resources” section of this issue). Other services that my position makes possible include guiding practitioners to lesson study networks, keeping pace with current research, sharing that research with schools, building partnerships among districts, and managing an e-mail list. This state-level assistance helps to

build capacity in the schools and districts so that lesson study can continue to grow.

Delaware also supports lesson study in conjunction with two other statewide professional development projects. The Delaware Writing Project (DWP) is a consortium of “teachers teaching teachers,” which fits naturally with the collaborative element of lesson study. DWP's professional development program applies concepts from lesson study to improving writing instruction. The Delaware Exemplary Mathematics Curriculum Implementation project, which supports the implementation of research-based, standards-driven mathematics curricula in middle and high school programs throughout the state, focused on lesson study during the 2000-2001 school year and continues to assist teachers to improve mathematics instruction.

Why is lesson study taking hold? As professional development, lesson study is unique, and teachers in Delaware have sensed this. As valuable as traditional professional development programs can be, they do not always relate to the real world of the classroom. Lesson study takes place in the classroom, with the most significant players—teachers and students—as the main participants. The process of teachers observing lessons, conducting research, and revising lessons encourages not only the sharing of pedagogical and content knowledge but also reflection. When teachers, through discussion and reflection, can improve the “what” and “how” of teaching, and when these improvements are based on students' needs, this is professional development at its best.

Collaboration is a cornerstone of lesson study that many teachers embrace. It alleviates the isolation of teaching and allows practitioners to share their experiences and knowledge. Because each lesson is developed with joint participation and input, all team members care about its success. The lesson belongs to everyone—not just to the person who



has volunteered to teach it. Consequently, teachers feel less anxious about opening their classroom doors to their peers and more comfortable with observers who are there to watch students.

To be sure, there are challenges. Lack of time and human resources and a reluctance on the part of some teachers are just a few challenges to implementing lesson study. But real change comes in small, measured steps. I am hopeful that, in time, lesson study will become an important and widespread component of professional development for teachers across the state of Delaware as well as across the country.

Janice Itzel's e-mail address is jitzel@state.de.us.

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Lewis, C. (2000). *Can You Lift 100 Kilograms?* (video).

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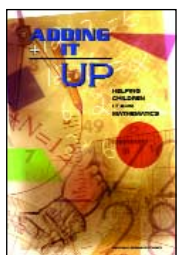
Resources for Decision Making

Authors: Steve Leinwand and Gail Burrill, eds.

Publisher: National Academy Press (2001), 49 pages

The Mathematical Sciences Education Board of the National Research Council created this guide to aid educators and other stakeholders in making crucial decisions regarding their mathematics programs. The book saves the educator time by summarizing research findings and policy recommendations from eight documents, published between 1998 and 2001, related to mathematical content, effective teaching and learning, and assessment. For each source, the report provides an overview, summarizes recommendations, and lists “actions educators might consider.”

pd45: \$18.00



Adding It Up:

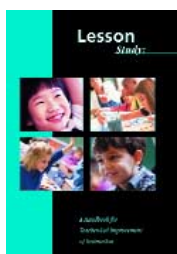
Helping Children Learn Mathematics

Authors: Jeremy Kilpatrick, Jane Swafford, and Bradford Findell, eds.

Publisher: National Research Council (2001), 454 pages

The result of 16 experts working through the National Research Council, this new book explores mathematics and learning in pre-K-8 students and posits that all students can and should be mathematically proficient. Focusing on issues associated with teaching and learning numbers, the book suggests changes for teaching methods, curricula, and teacher education. It also offers five key recommendations of detailed policies and practices that are needed if all children are to become mathematically proficient.

pd44: \$29.95



Lesson Study:

A Handbook for Teacher-Led Improvement of Instruction

Author: Catherine Lewis

Coming soon exclusively from RBS

Listening to Urban Kids

School Reform and the Teachers They Want

Authors: Bruce L. Wilson and H. Dickson Corbett

Publishers: State University of New York Press (2001, 144 pages)

Based on a three-year study in Philadelphia middle schools, this book gives voice to what students want from teachers and explores the value of students' criticisms and the implication of their insights for reform. Gil Schmerler of the Bank Street College of Education says the book “provides a cogent argument for including urban students in the dialogue on urban school reform” and calls its implications “unmistakable and compelling.”

ar26 \$16.95

Knowing and Teaching Elementary Mathematics:

Teachers' Understanding of Fundamental Mathematics in China and the United States

Author: Liping Ma

Publisher: Lawrence Erlbaum Associates, Inc., 166 pages

This is an eye-opening analysis of the differences between Chinese and American elementary school teachers and their teaching practices. The book explores how Chinese teachers' deep understanding of basic mathematics contributes to their students' success, and points to the need for reform in teacher training in the United States. The central message is that the quality of knowledge gained—for both teachers and students—is more important than the quantity.

pd40: \$21.50

Other featured publications:

- Fractions and Some Cool Distractions (video) cm10: \$24.99 Sale!
- ThinkAbility: A Practical Program to Improve Thinking Skills Using Games cm25: \$239.00
- The New Whimby Writing Program: How to Analyze, Organize, and Write Effectively cm24: \$149.25
- SAT Video Courses cm26 (verbal set): \$169.95; cm27 (math set): \$149.95; cm28 (advanced math set): \$139.95

The Role of “Knowledgeable Others” in Lesson Study

By Jim Harper

While lesson study is often lauded as a school-based, teacher-driven form of professional development, its full implementation also demands that schools connect with professionals from outside of the school, known as “knowledgeable others.”

Who are these knowledgeable others? In Japan, they are typically educators from universities or the Ministry of Education who are master observers and content specialists. As schools implement lesson study in the United States, they need to make more of these important connections.

“When lesson study groups think about whom to ask to participate in their professional development, college-level educators are not even on the radar screen,” says Tad Watanabe, associate professor of mathematics education at Towson University in Maryland. “There are many missed opportunities. If teaching is a complex activity—and we know that it is—then the value that knowledgeable others can bring should be explored.”

Watanabe attributes this disconnect to the fact that lesson study feels “school-based” and that in the United States a palpable gap already exists between school and college-level educators. Bridging this gap will involve changing attitudes and building trust.

“Universities have to be willing to go to schools and talk with teachers as equals, and teachers have to perceive that the discussion is among equals,” says Watanabe.

Tapping into Mentors

Because lesson study is relatively new in the United States, there are very few experts available to teach schools how to conduct lesson study. But this limitation should not deter schools



from trying, says Clea Fernandez, assistant professor at Teachers College/Columbia University and a former mentor to New Jersey’s Paterson School 2, a foremost practitioner of lesson study in the U.S.

“I’m more and more optimistic about people being able to pick up [lesson study],” says Fernandez. She encourages schools that are embarking on lesson study to look for knowledgeable others who can help teachers transcend the limits of their own content knowledge.

In addition to her university colleagues, Fernandez has found “invaluable contributions” from School 2 mathematics teacher Bill Jackson, who initiated lesson study at his school a few years ago along with the principal, Lynn Liptak. School 2 also enlisted the support of Patsy Wang-Iverson from the Mid-Atlantic Eisenhower Consortium at RBS, who was already working with the school and made lesson study her priority as well.

“Many schools conducting lesson study tend to have partnerships already that they can draw upon,” notes Fernandez. Such partners may include trusted content specialists or mentors who are skilled in classroom observations and who can help teachers to develop content knowledge and observation skills.

Sharing the Knowledge

Teachers in America who are beginning to implement lesson study can draw upon knowledge from Japan, where the approach has been practiced widely for decades. Lesson study in Japan is well documented, and hundreds of teachers’ lessons are available at local bookstores.

“Lesson study is really a form of research,” says Fernandez, who hopes that its practice will generate widespread publication by teachers in the United States. “The process of writing about it is critical.”

Fernandez notes that in Japan the teachers’ writings are used by another type of knowledgeable other—instructional superintendents—who are the equivalent of district-level specialists in the U.S. These professionals share reports and findings between schools and lesson study groups and “infuse these groups with new ideas,” says Fernandez.

Learning to See Lessons

Knowledgeable others should be involved in every step of lesson study, according to Watanabe, in order to deepen teacher content knowledge and to push a group’s thinking—much like the role teachers plays for their students. They also need to be master classroom observers.

“Observation is a special skill that is nurtured through lesson study,” says Makoto Yoshida, president of Global Education Resources, who has worked extensively with School 2. He explains that knowledgeable others contribute experience and a different perspective, which helps teachers to go beyond simple collaboration to actual improvement. They also need to foster an open dialogue without any conflict of interest. “It’s not the same as a principal observing,” he says.

Yoshida acknowledges the difficulties teachers have with opening up their classrooms to observation, and he has seen the tears that can result when teachers take criticisms of their lessons as personal attacks. One technique he uses to avoid this feeling is to focus the lesson discussion on understanding the process of student thinking instead of on the teacher’s style. He notes that, in contrast to how Japanese teachers respond after observing lessons,

American teachers tend to comment more on what the teacher did than on what the students learned. For lesson study to be successful, student learning must always be at the center of the process.

Another observation guideline comes from a colleague of Watanabe, who suggests that an effective knowledgeable other will “praise ten, critique one.” This emphasis forces participants to acknowledge the complexity and craft of good teaching while still allowing for improvements.

Reaping the Benefits

Lesson study also offers benefits for knowledgeable others, who frequently are not full-time classroom teachers. “It keeps them connected to actual learning in the classroom, which should keep them more honest about their ideas,” says Watanabe.

Because of these benefits, finding a knowledgeable other may be one of the easier aspects of lesson study.

Fernandez says that there is tremendous curiosity about lesson study and that she never has a problem convincing potential knowledgeable others to participate with her. She sees this swell of interest as good news for the future of lesson study.

“The power of lesson study lies in connecting all these groups,” says Fernandez. She notes that initial efforts in California a decade ago met resistance, but that “now there’s a will to do lesson study.”

Where there is that will, there is most likely a knowledgeable other who will enhance teacher knowledge and student learning by providing honest criticism, encouragement, and vision.

Resources for Learning About Lesson Study

For a more complete and dynamic list of resources, including over 15 articles, visit the RBS Web site (www.rbs.org) section Research & Resources and select **Lesson Study**. Please direct any questions, updates, or ideas about lesson study to Patsy Wang-Iverson at wang@rbs.org.

Global Education Resources

<http://www.globaledresources.com>

Led by Makoto Yoshida, Global Education Resources, LLC (GER) offers professional development and consulting to schools and districts interested in implementing lesson study.

Lesson Lab Inc.

<http://www.lessonlab.com>

Founded by The Teaching Gap co-author James Stigler, this research-based company sells multimedia technology and training to create electronic communities for facilitating district- or state-wide collaboration.

Lesson Study in Japan — U.S. Science Education

<http://lessonresearch.net>

Funded by NSF and featuring research by Catherine Lewis, this Web site provides users with background information on lesson study and publications for both the research and practitioner communities. Available videos include *Can You Lift 100kg?*, *The Secret of Trapezes*, *The Secret of Magnets*, and *Three Perspectives on Lesson Study*.

Lesson Study Research Group

<http://www.tc.edu/centers/lessonstudy>

The mission of the Lesson Study Research Group (LSRG) at Teacher’s College/Columbia University is to explore how lesson study can improve the educational experience of American educators and students. Directed by Clea Fernandez, the group’s networking activities include the Lesson Study Listserv, Discussion Forum, and Groups database of lesson study initiatives.

Lesson Study: Teachers Learning Together

Northwest Teacher,
Volume 2, Number 2,
2001



This mathematics and science journal from the Northwest Regional Educational Laboratory provides a succinct description of lesson study and lively accounts of implementation in several schools. Available by request from the Mid-Atlantic Eisenhower Consortium @ RBS.

TIMSS Resource Center @ RBS

<http://www.rbs.org/mathsci/timss/index.shtml>

This section of RBS’ Web site contains many resources and links related to the Third International Mathematics and Science Study, which provide a wealth of useful data and information on curriculum, instruction, teacher and student lives, and student achievement.

Guidelines for Lesson Observations and Debriefings

Developed collaboratively by Global Education Resources LLC, Paterson Public School 2 (Paterson, NJ) and Research for Better Schools, based upon the lesson study experiences at School 2.

Lesson Study Guidelines for Observations

Writing Team Responsibilities Before the Study Lesson

1. Invite Outside Observers

- Invite other teachers, administrators, and at least one knowledgeable other from outside the school setting, such as a university-based educator. The number of observers will depend on how comfortable the group is with the lesson study process.
- Ask one knowledgeable other to be the final commentator.

2. Assign Specific Tasks to Writing Team Members

- Assign a moderator and a general recorder for discussion sessions.
- Assign members to observe and record specific student responses during the lesson, such as one student's responses or the role of student collaboration.
- Assign a videographer. While important for record-keeping, videotaping is not a substitute for live observation.

3. Prepare Materials for Observers, Including:

- The lesson plan. Include the goal of the lesson, where the lesson fits in a unit, where the lesson fits across grades in the entire curriculum, how it relates to the school goal, anticipated student responses, and progression of the lesson.
- Copies of student worksheets
- Seating charts containing student

names and space to write notes

4. Organize the Details and Logistics

- Arrange the classroom so that observers have space to stand and to circulate through the students' workspaces.
- Allow time in the schedule to meet with the invited observers prior to the lesson to specify the kind of feedback being sought.
- Schedule a break after the lesson to allow observers to gather their thoughts for the debriefing.

Observers' Responsibilities During the Study Lesson

1. Respect Natural Atmosphere of the Classroom

- Minimize side conversation during the lesson.
- Remain in the classroom during the entire lesson to capture how the lesson is set up, its flow, and the conclusion.
- Do not block the students' view of the blackboard; do not block video camera.
- Circulate freely when students are working individually or in groups but move to the side or back of the room during whole class discussion.
- Minimize interaction with students. Refrain from teaching or assisting the children. Occasional interaction is permissible if done discreetly and with the purpose of understanding student thinking.

2. Become a Researcher

- Keep in mind the goal of the lesson.
- Use the lesson plan, seating chart, and work sheets to record your data.
- Study how students are collaborating.
- Take notes on individual student responses, using the students' names.
- Indicate how individual students constructed their understanding

through activities and discussions.

- Document the variety of solutions that individual students use to solve problems, including errors.
- Examine the teacher-student interaction; e.g. is the teacher attempting to call on all students?
- Document the type of student talk and student engagement.

3. Consider These Questions While Observing

- Was the goal clear? Did the supporting activities contribute effectively to achieving the goal?
- Was the flow of the lesson coherent, and did it support students' learning of the concept?
- Were the problems and the materials helpful in achieving the goal of the lesson?
- Did the classroom discussions help promote student understanding?
- Was the content of the lesson appropriate for the students' level of understanding?
- Did students apply their prior knowledge to understand the content of the lesson?
- Did the teacher's questions engage and facilitate student thinking?
- Were student ideas valued and incorporated into the lesson? Did the lesson summary refer to student theories or ideas?
- Was the lesson summary consistent with the lesson goal?
- How does the teacher plan to reinforce what the students learned during the lesson?

Lesson Study Guidelines for Debriefings

Writing Team Responsibilities Before the Debriefing

1. Prepare the Setting

- Hold the debriefing in the same classroom where the lesson was taught. Discussants then are able to refer to the blackboard and student work. When this is not possible, bring to the debriefing the materials used/produced during the lesson.
- Prepare the room so that the writing team, moderator, recorder, and final commentator are seated together at the front of the room.
- Arrange a short meeting shortly following the debriefing for the writing team to reflect on the lesson and debriefing while memory is still fresh.

2. Establish the Structure of the Debriefing

- Establish with the moderator and writing team the following structure for the debriefing to include comments from:
 - 1) the teacher who taught the lesson
 - 2) the writing team
 - 3) the observers
 - 4) the final commentator
- Remind the teacher and writing team to keep their comments brief to allow the majority of time for comments by the observers. The writing team should be allowed to respond briefly to the observers' comments if desired.

Key Roles During Debriefing

1. Moderator Responsibilities

- Begin the debriefing by introducing the team and outlining the structure of the discussion.
- Keep the debriefing focused and keep track of time.
- Make sure the conversation is not dominated by one or a few observers.

- Allow all who wish to comment time to speak.
- Reserve at least 10 minutes at the end for the final commentator's comments.
- Refrain from making editorial comments.

2. Recorder Responsibilities

- Take notes of the debriefing.
- Produce a summary of the debriefing for the lesson study report.
- File the summary with other lesson study material.

3. Final Commentator Responsibilities

- Assimilate the debriefing into a final commentary of about 10 minutes.
- Offer thoughts from observations, past and current experiences, current research.

Discussion Guidelines for the Debriefing

1. Keep Comments Clear and Focused

- Keep comments focused on student thinking and learning and on the content of the lesson, not on teaching style.
- When commenting on the lesson, keep in mind the goal of the lesson and criteria laid out by the writing team.
- Base discussion on individual records of observations and quantify comments with concrete and specific evidence.

2. Maintain a Respectful Atmosphere

- Begin comments by identifying the positive aspects of the lesson.
- Be sure the teacher who taught the lesson is not made to feel like s/he is being personally criticized.
- Do not focus on the success or failure of the lesson or on teaching style.

- Select key, relevant observations and avoid a "laundry list."
- Do not be a passive listener. Try to contribute to the debriefing; however, it is not necessary to repeat what has already been stated.

Two lesson study activities that involve visitors are the observation of a study lesson (a lesson developed collaboratively) and the discussion that takes place after the observation. These guidelines intend to prepare and to focus all participants on the most important issues during their brief time together.

The major purpose of examining a live lesson is to understand students' thinking and learning processes during the lesson. To facilitate each observer's role as a researcher, the group that has prepared the lesson, the Writing Team, conscientiously prepares materials and structures the observation and the debriefing. The Writing Team may wish to send these guidelines, along with the lesson plan, to the participants before their arrival and/or use them during a briefing immediately before the observation.

Observers function not as co-teachers but as researchers examining particular aspects of the lesson. As a researcher, the observer should try to view the lesson from an objective perspective—without judgment—suspending one's personal beliefs about teaching and learning. Far from passive, observers must see student work up close and record their findings in detail.

These data provide fodder for rich discussions during the debriefing. Their purpose is to deepen participants' understanding of the lesson content and of student thinking and learning. By observing the lesson, participating in the debriefing, and learning how other observers viewed the lesson, each individual is able to reflect on his/her own perspective and teaching.

REGIONAL CONFERENCE

You are invited to join the Mid-Atlantic Eisenhower Consortium for "Closing the Performance Gap in Mathematics and Science: Resources to Help All Students Reach High Standards." The conference will take place at the new Hyatt Regency at Penn's Landing in Philadelphia from September 30 to October 1, 2002. Come early and hop a ferry to the USS New Jersey and New Jersey Aquarium, or walk to fine restaurants and the nearby historic district. Register before July 31 and save \$25 off of the \$75 fee. Two hundred registrations will be accepted on a first come/first served basis. Any questions may be directed to Carol Crociante at 215-574-9300, x 280, or crociante@rbs.org.

GOVERNOR'S ACADEMY

Are you concerned about what goes on in K-8 urban classrooms in Pennsylvania? Then sign up for the (*virtually free!*) Governor's Academy for Urban Education Academy, to be held June 23-28, 2002 in Allentown, PA. Academy content and registration details are available at <http://www.pa-academy.org/gua>.

Visit the RBS Web site for these and other announcements.

About RBS: www.rbs.org

Research for Better Schools, Inc. is a private, nonprofit R&D corporation dedicated to the improvement of education through the use of research findings and best practices.

Co-directors: Dr. Keith M. Kershner,
Dr. Louis M. Maguire

About the Consortium: www.rbs.org/eisenhower

The Mid-Atlantic Eisenhower Consortium for Mathematics and Science Education supports professional development and other improvement efforts in the District of Columbia, Delaware, Maryland, New Jersey, and Pennsylvania. Services and membership are free. It is a part of the National Network of Eisenhower Regional Consortia and Clearinghouse, www.mathsciencenetwork.org

**MATHEMATICS AND SCIENCE
EDUCATION NEWS FROM THE
MID-ATLANTIC EISENHOWER
CONSORTIUM**

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