

Lesson Study Comes of Age in North America

Lesson study, the dominant form of professional development for teachers in Japan, has spread rapidly in the U.S. since 1999. The authors discuss the growth and success of lesson study at Highlands Elementary School in California's San Mateo-Foster City School District and identify conditions needed for scale-up.

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IN LESSON study, teachers collaboratively plan, observe, and analyze actual classroom lessons, drawing out implications both for the design of specific lessons and for teaching and learning more broadly. Long the dominant form of professional development in Japan, lesson study has spread rapidly in the United States since 1999. Previous *Kappan* articles have praised lesson study's potential for improving instruction but questioned whether it might become one more short-lived fad.¹

Since 2000, we have followed the development of lesson study at Highlands Elementary School, one of the first U.S. schools to adopt the practice. Serving just over 400 K-5 students in an urban/suburban district

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in the western U.S., Highlands School provides both an "existence proof" that U.S. teachers can use lesson study to improve instruction and a window into the conditions needed for its success.²

HISTORY OF LESSON STUDY AT HIGHLANDS SCHOOL

As instructional improvement coordinator for a cluster of schools in San Mateo-Foster City (SMFC) School District in the late 1990s, Mary Pat O'Connell was looking for a professional development model that would support sustained, teacher-led improvement of classroom instruction. Lesson study, as described in *The Teaching Gap*,³ seemed to fit the criteria that O'Connell and colleague Jackie Hurd (a half-time Highlands teacher and half-time district mathematics coach) had laid out. After reading about lesson study, Hurd recalls, she felt "certain we wanted to do lesson study. How to do it was much less clear."

Initially, O'Connell and Hurd teamed up with other district mathematics coaches, and O'Connell wrote an open letter inviting district teachers to try out les-

son study.⁴ The initial 26 volunteers included three other Highlands teachers. With funding for substitutes and stipends for after-school work provided by the district, the Highlands group conducted two lesson study cycles during the 2000-01 school year and presented the results to the Highlands faculty in the spring of 2001.⁵ Nearly all of the Highlands faculty decided to begin lesson study the following fall, and the remaining faculty joined the next year.

Lesson study has continued ever since at Highlands and is now in its sixth year. Lesson study groups typically include three to six teachers from the same or adjacent grade levels. They conduct two cycles of lesson study per year and share what they learn with the entire faculty at regular intervals. The faculty selects a school-wide research theme (e.g., reduction of the achievement gap) that provides a common focus for the work of the lesson study groups. Each lesson study cycle consists of study of relevant background materials, collaborative planning of a “research lesson” that is taught by one team member while others observe and collect data on students, and a post-lesson discussion in which teachers share information and discuss implications.

All members of the Highlands faculty now participate, and those who were initially reluctant have become active participants. Of 22 teachers currently teaching at the school, 14 have taught research lessons, and six have made presentations about lesson study outside the school. Highlands teachers have also taken the initiative to expand lesson study from mathematics to language arts, social studies, and science. Mary Pat O’Connell became principal of Highlands in October 2001,

and she has provided two hours per month within the school day for lesson study, by reducing the number of faculty meetings and handling routine faculty business in other ways.

Lesson study has begun to show signs of institutionalization at Highlands. For example, lesson study has replaced evaluative observations for tenured teachers, and, because veteran teachers and new teachers participate in the same lesson study groups, it serves as the vehicle for mentoring. Teachers actively use lesson study to make sense of and bring to life new mandates (e.g., incorporation of state standards), new ideas (e.g., differentiation of instruction), and new curricula (e.g., the periodic table in grade-5 chemistry). Highlands has also hosted four conferences on lesson study, each one featuring research lessons with Highlands students taught by Highlands teachers or by guest teachers, including an experienced Japanese mathematics educator, a county literacy specialist, and a program officer from a local foundation. Lesson study seems to have become a fixture in the school’s practices, structures, and identity.

THE EVOLUTION OF LESSON STUDY AT HIGHLANDS

Four changes have taken place in lesson study at Highlands, and they reveal how Highlands educators have expanded their focus from lesson study’s surface features, such as development of lesson plans, to its underlying principles, such as increasing teachers’ opportunities to learn from one another, from practice, and from the curriculum. A shift of this kind is noteworthy because reforms often fail when their surface features are implemented in recipe-like fashion, without sufficient attention paid to the underlying rationale. (For example, educators may focus on such surface features of mathematics instruction as the use of “manipulatives” rather than on the underlying principle of promoting students’ mathematical reasoning and understanding.⁶)

1. *Lesson study is about teacher learning, not just about lessons.* Teachers at Highlands initially conceived of lesson study as polishing and disseminating lessons, and their effort was dubbed “polishing the stone.” However, they soon dropped this moniker and began to tell colleagues that “it’s not just about the lesson.” They began describing lesson study as an opportunity for teachers to “be researchers,” “test our own knowledge of how our students think,” and “understand the content and why it’s important.” The lesson study founders

abandoned their original plan to distribute “polished” lesson plans on the district intranet. Instead, they spread their work through open houses in which colleagues could view and discuss live research lessons and hear teachers talk about what they had learned from engaging in lesson study.

2. *Effective lesson study hinges on skillful observation and subsequent discussion.* Initially, many post-lesson discussions at Highlands focused on such easily observed aspects of student behavior as whether students followed directions and treated their peers with respect. Over time, however, post-lesson discussions have be-

come more focused on student thinking and driven by data collected during the research lesson. In turn, the data collection itself has become more intentional and is planned in advance with a particular focus. For example, a 2001 lesson on addition and subtraction “fact families” provided no specific guidance on what to observe during the research lesson, and the post-lesson discussion focused on such general issues as whether students were “engaged,” “on-task,” and “successful.” In contrast, a 2003 lesson that focused on solving multi-step problems included specific guidance about what aspects of student thinking observers should attend to. The resulting discussion focused on students’ solution strategies, information organization, and types of errors. Lesson study teams now often formulate a set of questions to guide the post-lesson discussion, rather than simply presenting data collected by each team member. Collaboration with content specialists has sparked ideas about the particular aspects of student thinking to target for observation.

3. *Lesson study is enhanced by turning to outside sources of knowledge.* During the first year of schoolwide lesson study, no study group worked with “knowledgeable others” from outside the school. Since then, Highlands teachers have often enlisted outside educators or content specialists to provide feedback on emerging ideas or lesson plans, participate in research lessons as data collectors or commentators, or teach public lessons at the school. Likewise, teachers have drawn on an ever-widening circle of print materials. In their first year of lesson study, Highlands teachers commonly drew only on their adopted textbooks and state standards. Since then, it has become common for teachers

to compare several textbooks’ treatments of a particular topic and to consult innovative materials and outside research articles. The lesson study time line now includes time for drawing on research and other outside resources.

4. *The phases of the lesson study cycle are balanced and integrated.* Initially, teams often spent many meetings honing a research lesson before the first teaching. They spent far less time drawing out the implications of the research lesson for their future teaching. Indeed, the research lesson often felt like a final performance rather than a catalyst for further study and improvement of

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practice. In contrast, many teams now begin new lesson study cycles by reviewing student data and following up on problems in student learning that surfaced in prior lesson study work. Teams sometimes enrich the ideas about student learning that are available in the early phase of the lesson study cycle by trying out a task in their classrooms and bringing back the data or by having one team member teach an initial “dirty lesson” while others collect data.

HOW HAS HIGHLANDS CHANGED?

Opportunities for on-the-job learning have increased as lesson study has become established at Highlands. A group focused on multistep mathematics problems illustrates these opportunities.

The group located and read various curricula, assessments, and research studies on multistep problems. Then they selected some problems to try in their classrooms and brought back the resulting student work to the group. Discussion of the student work helped team members pinpoint students’ difficulties and design the research lesson. Student work revealed, for example, that many students did not clearly identify what they were trying to find out. Observation of students during the research lesson revealed that several commonly taught problem-solving strategies, such as underlining information in the problem and looking for question marks, did not necessarily help students solve the problems. Teachers also noticed during the research lesson that students “checked their work” by checking calculations only, not by examining the problem setup.

Taken together, these observations led teachers to incorporate in their subsequent work a five-step problem-solving model that they had located in their reading. The model was designed to help students routinely ask themselves such questions as “What do I know?” and “What do I want to know?” as they approached a variety of problems. In their end-of-year report to the faculty, group members talked about what they had learned:

Teacher 62: It’s really important to teach that problem-solving chart and embed it all the time into everything that we do, whether it’s social studies, science, math, or whatever. Because there is an organizational part. . . . We were talking about something in the class . . . and I pulled this chart out and they [the students] went like, “Oh, no. You have it too!” [Everybody laughs.] And they go, “The guide to problem solving. It’s in your room too?” I said, “It’s going to stay in my room. And we’re going to refer to this. . . . You know what? It applies to every single thing: ‘What do you know?’ and ‘What do you want to find out?’ and ‘What will you do?’”

Teacher 111: I had mine laminated . . . and [put into] Braille. I’m so into it.

Teacher 19: I’ve done word problems with kids, and I’ve done [identification of] challenging parts [of problems]. But I’ve never, like, taken them through these five steps, and [I’m] realizing that it isn’t in the standards, [isn’t] really directly in the curriculum, and yet it’s a critical mathematical skill that kids need to have.

The teachers’ comments highlight that lesson study is not simply about improving a single lesson or even a single subject area. Their comments also suggest how instructional coherence may emerge across classrooms and how a schoolwide culture of learning from practice may be built as groups of teachers conduct and share investigations. Teachers may develop a sense of collective efficacy so that mandates like standards-based instruction feel less overwhelming. As Hurd has noted, “The first year of lesson study, when we first did standards-based instruction, everyone said the new California standards weren’t doable. But by the end of the year, they felt doable.”

The fact that each teacher in a lesson study group brings particular knowledge and personal characteristics to the table makes it challenging to document teachers’ learning from lesson study. An episode from early in the first year of schoolwide lesson study at Highlands illustrates how four different team members gained four

different things from the same meeting.⁷ A first-year teacher learned about “landmark” numbers and “KWL charts” when the experienced teachers used these terms during the meeting. She was able to ask about their significance and learn about their use in the classroom. A somewhat more experienced teacher reported that the meeting led her to rethink her assumption that a single lesson would achieve a single standard and to come to a realization that, “with standards-based instruction, the standards are going to overlap.” A third group member commented that the meeting helped her focus not just on the activity at hand, but on “where I want the students to be, what is my ultimate goal.” The meeting persuaded the fourth member of the group that collaborating with colleagues who taught a different curriculum could be useful. This teacher had shown little interest in the group’s discussion until members suggested she rewrite the assessment for her class, so that she could collect data to share at the next meeting. “Voilà, I feel connected,” she said with a big smile on hearing this suggestion. Lesson study has thus provided regular opportunities for Highlands teachers to make sense of knowledge from observations and texts, to push one another’s thinking about subject matter and learning, and to develop a sense of mutual responsibility for students’ learning.

Student achievement data at Highlands suggest that lesson study is paying off for students as well. Figure 1 compares the school’s scores on the state mathematics achievement test with those from schools throughout the district and state over a three-year period. An additional analysis (not shown) found that, for the same period, the net increase in mathematics achievement for students who *remained* at Highlands School was more than triple that for students who remained elsewhere in the district as a whole (an increase of 91 scale score points compared to 26 points), a difference that was statistically significant. While we can’t claim a causal connection between the achievement results and lesson study, changes in student populations at the school or district level, along with other obvious explanations, have been ruled out. Schoolwide lesson study appears to be a primary difference between the professional development at Highlands and the practices of other district schools during the years studied.⁸

WHAT CAN OTHER LESSON STUDY SITES LEARN FROM HIGHLANDS?

Highlands drew heavily on existing lesson study re-

search and practical resources to build its effort, often expanding on them so that additional resources are now available to other sites. Other aspiring lesson study sites may want to take particular note of three aspects of the lesson study effort at Highlands that seem to distinguish it from sites where lesson study has not taken hold.

Learning stance. From the start, the founders of the SMFC lesson study effort saw their work as learning — figuring out how to make lesson study work in the U.S. — not as reproducing a program from a blueprint. They drew actively on the knowledge and experience of lesson study researchers and practitioners, and they also made use of video, print, and Web-based materials, even as they collected and contributed records of their own practice.⁹ They built internal and external formative assessment into their work, regularly using it to modify both their lesson study process and their knowledge of mathematics teaching and learning.

For example, feedback at the end of the first year suggested that many teams tinkered around the edges of mathematics lessons rather than addressing core problems in teaching and learning. This led the group to pursue more active use of outside specialists and resources to illuminate core aspects of mathematics. (Subsequently, similar processes improved the lesson study experience in language arts.) The step of having teachers themselves solve and discuss mathematical tasks before an-

ticipating student solution methods was built into the lesson study routine after early groups tried this strategy, which had been modeled for them in mathematics workshops provided by a local foundation.

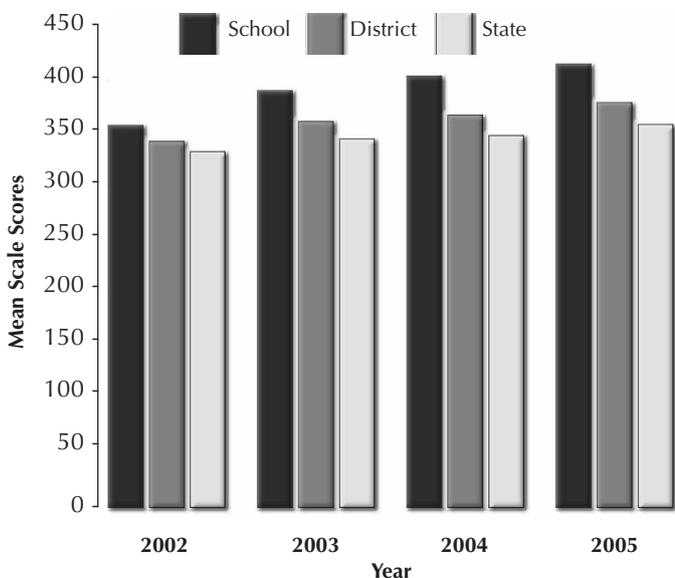
As one of us wrote several years ago, lesson study is a simple idea but a complex process. Even after nearly 30 years of collective experience studying lesson study, we are all still learning about its many forms and purposes. Remarkably, some U.S. trainers seem to believe that participation in one or two lesson study cycles qualifies them as experts who can provide definitive blueprints to others. Premature expertise may pose a substantial threat to lesson study. The appropriate attitude for those who would help others adopt lesson study is captured in the proverb “The road is made by walking.”¹⁰

The learning stance of SMFC lesson study leaders encompassed not just the lesson study process but the subject matter and its teaching and learning. During the first year of the lesson study work, Hurd answered a question about the attitudes essential to the process: “If you come into lesson study and you are acting like ‘I’m the hottest thing out there, and I’ve got all these great ideas, and I’ll share them with you guys,’ you’re not going to get anything out of it. You can always get better at teaching.”

The expectation that teachers will learn about subject matter and its teaching and learning through lesson study has been a steady theme throughout the five years of the lesson study effort at SMFC. For example, a video shot in 2002 and widely used to introduce our lesson study work prominently features teachers’ initial struggle to understand the mathematics of a problem and their strategies to build their own mathematical understanding.¹¹ In 2005, as one Highlands lesson study group began to study writing instruction, experienced teachers readily volunteered that they did not believe they had any effective strategies for teaching writing. Two members commented afterward that lesson study fosters a culture in which, as one put it, “you’re learning. You don’t know everything.” So teachers feel safe revealing gaps in their knowledge.

Internal ownership — external knowledge access. Outside reforms that are pushed into a school typically face challenges different from teacher-led reforms that emerge from within.¹² Outside reformers may fail to build buy-in, may not adequately adapt a reform to the realities of a particular setting, or may fail to draw on teachers’ local knowledge of students.¹³ Teacher-initiated reforms may fare well on

FIGURE 1.
Mean Scale Scores, Grades 2-5, for California Standards Test in Mathematics



these fronts but fail to access research-based knowledge that is critical to improving instruction.

Highlands teachers managed to draw actively on external knowledge even as they maintained internal ownership of the lesson study effort. During the first year of schoolwide adoption, as the experienced lesson study practitioners were working to build the practice at Highlands, outside sources of knowledge were not accessed frequently. Those that were used tended to be focused on building lesson study rather than on teaching and learning mathematics. But as teachers became comfortable working together and observing and discussing lessons, they drew increasingly on outside resources related to the teaching and learning of mathematics. They benefited from the assistance of local university-based educators, a long-term foundation-funded mathematics initiative, and Japanese colleagues willing to visit the district to engage in joint lesson study one or more times each year.

Serving the school's work. Like most U.S. schools, Highlands is subject to a variety of pressing mandates from the district and state. Unlike most schools, though, Highlands uses lesson study to respond to these external mandates. Principal O'Connell's vision of lesson study as a vehicle to accomplish important schoolwide work led her to support it in distinctive ways that are not found at schools where lesson study is simply one choice from a potpourri of professional development options. O'Connell provides such resources as books and student data that help teachers focus on particular challenges facing the school; she creates meeting agendas that help lesson study teams connect their work to the schoolwide research theme, asking teachers, for example, to describe how their work supports standards-based instruction; and she regularly assesses the progress of the lesson study by participating in a group, reading notes from the various groups, and providing opportunities for schoolwide sharing of the lesson study work and results. As O'Connell engineers it, lesson study is not one more demand on teachers but the primary means of addressing the many demands they face.

For example, in response to the national-, state- and district-level focus on narrowing the achievement gap, O'Connell gave teachers time to examine the multi-year trajectories of Highlands students in various low-achievement categories. She also provided research, instructional resources, and meeting agendas that encouraged lesson study groups to address the achievement gap as an integral part of their work. A schoolwide research lesson gave teachers an opportunity to see and discuss strate-

gies to support second-language learners and socioeconomically disadvantaged students, as well as to carefully observe selected students from various backgrounds. In this way, the school used lesson study to help teachers make sense of an important new external mandate and integrate it into their classroom instruction alongside existing mandates (e.g., for standards-based instruction). Thus lesson study can be a force for coherence in a profession where we often face a barrage of urgent and competing demands.

WHAT WOULD IT TAKE TO SCALE UP THE HIGHLANDS EXAMPLE?

The work with lesson study at Highlands provides evidence that U.S. teachers can overcome the obstacles initially anticipated for lesson study: lack of time, minimal collaborative experience, and limited access to content knowledge. Moreover, lesson study gives teachers a way to improve instruction at the local level. But will local pockets of success like Highlands result in wider change? What would it take for schools throughout the U.S. to build effective systems of practice-based learning?

We have already noted the conditions that have supported the work at Highlands, including a learning stance, the ongoing use of formative data to improve the lesson study work, internal leadership by teachers, the use of lesson study to serve the school's broader mission, and the active use of external knowledge about lesson study and about subject matter and its teaching. In addition, we believe that four changes in the larger education policy climate could help practice-based learning systems like that at Highlands to become widespread.

1. Cross-site learning about lesson study. Teachers at Highlands — and other schools pioneering lesson study — have developed much know-how about lesson study and its adaptation to the U.S. Currently, they have few opportunities to compare knowledge across sites and share what they have learned in order to build a more robust model of lesson study and of teaching and learning. A cross-site learning community for practitioners of lesson study is needed, so that individual groups can build on one another's learning, rather than continually reinventing the wheel.

Although a remarkable number of public lessons are now being conducted in the U.S., opportunities for U.S. lesson study practitioners to learn across sites remain haphazard and don't allow, for example, for regular cross-site study with intervening periods of work

in one's own locale. Researchers might provide critical support for cross-site learning by documenting the features of lesson study in different venues and developing reliable indicators of progress in the understanding and use of lesson study. For example, Highland's shift from brief, general discussions of students' social behavior and engagement to detailed, warranted observations of student learning might serve as a useful indicator for groups trying to see whether their work is progressing in the right direction.

2. A diverse ecology of lesson study. Jackie Hurd participates in a cross-district lesson study group for mathematics coaches, designed by the coaches to provide a place where they can "push harder" on their own mathematical understanding. The coaches draw on a broader range of research and curricular resources than is typical for school-based groups (whose members are not all mathematics specialists). Such specialized lesson study groups are common in Japan and may provide important supports for school-based lesson study, when members carry knowledge back and forth between the two settings.

In Japan, specialized lesson study may be organized around particular disciplines (e.g., writing, mathematics), particular visions of learning that extend across disciplines (e.g., problem solving, experiential learning), or other kinds of goals (e.g., higher achievement by students from historically marginalized groups). Sponsors of specialized groups are various, including subject-matter organizations, university-affiliated elementary schools, and independent teacher circles. Research lessons conducted by these groups often draw thousands of educators from across Japan; often university professors join this type of lesson study work and provide input into the planning, extra eyes to collect data during the lesson, and public commentary on the research lesson and its connection to key issues in the discipline.¹⁴

The knowledge that these specialized groups gain from their research lessons need not be independently reinvented by every school-based lesson study group in Japan. For example, if teachers in a university-based elementary school focus their lesson study on students' common misunderstandings of proportional reasoning and on the tasks and representations that help students build accurate understanding, school-based groups elsewhere can take advantage of this knowledge. Such knowledge about teaching and learning is spread in many ways: by word of mouth among teachers, by well-known educators who travel to comment on public re-

search lessons at many schools, and through reports and videos produced by the lesson study team itself.

The ecology of Japanese lesson study also includes district-based lesson study, in which teachers work in cross-school groups that focus on an instructional area of particular interest to them. One district we studied had 17 lesson study specialties from which teachers could choose, including all academic and nonacademic subjects and such topics as second-language learning, class meetings, and schoolwide events. Teachers presented research lessons in all these areas during district-wide professional development days twice a year. Such district-based groups often draw on the lesson study work conducted by the specialized groups, bringing it to life in research lessons with local students. In this way, district-based groups provide a pivotal translation point where local teachers make sense of outside knowledge.

For example, the Japanese instructional practices in mathematics that were so impressive to researchers in TIMSS (Third International Mathematics and Science Study) had been developed by teachers through decades of lesson study on such topics as problem solving, mathematics journal writing, and classroom discussion. And all of these methods and more are regularly made visible in research lessons, particularly those sponsored by professional organizations and university-based elementary schools. Local school-based lesson study groups can draw on the findings from other venues and are uniquely positioned to bring them to life with the students they know best.

We may be seeing the beginnings of a North American lesson study ecology in which local lesson study practitioners draw on the advances of specialized groups. Research lessons conducted at Japanese schools in the U.S. and by Japanese educators working in the U.S. (for example, Akihiko Takahashi of DePaul University) now attract capacity crowds yearly, and some professional organizations (among them the National Council of Teachers of Mathematics) now include public research lessons in their conference fare. Videos in English extend the reach of research lessons conducted by Japanese practitioners. Though these fledgling efforts are small in comparison to the opportunities available to Japanese lesson study practitioners, their existence demonstrates the considerable interest of U.S. practitioners in this form of learning.

3. Pathways linking lesson study to textbooks. In Japan, specialized lesson study groups often focus on difficulties or gaps in current curriculum and instruc-

tion. Curricular innovations and theory from North America and Europe (e.g., George Polya's ideas about problem solving or the idea of whole-language instruction) are regularly translated and scrutinized in public research lessons. All of this activity provides a steady flow of new ideas into the Japanese system. When textbooks are revised by their teacher-authors (every four years or so), they reflect what has been learned from research lessons that have been thoroughly studied and vetted, and they make that learning broadly available to all teachers.¹⁵

In contrast, U.S. teachers often face textbooks that include untested or ill-conceived instructional ideas and omit important ones.¹⁶ As the Highlands teachers noted about the habits of mind required for good problem solving, "It isn't in the standards, isn't really directly in the curriculum, and yet it's a critical mathematical skill that students need to have."

4. Provision for "inside-out" reform. A decade ago, Larry Cuban and David Tyack recognized the power of "inside-out" reforms, which are led from within a school rather than pushed into a school from the outside. Similarly, Richard Elmore has long argued that U.S. education suffers not so much from an inadequate *supply* of good programs as from a lack of *demand* for good programs on the part of practicing educators. He notes that "the primary problem of scale is understanding the conditions under which people working in schools seek new knowledge and actively use it to change the fundamental processes of schooling."¹⁷ Yet the response of our education system to problems is typically to supply another program, not to nurture demand.

The rapid emergence of lesson study in many parts of the United States is an expression of demand for instructional improvement on the part of educators. It is an indication that some educators are willing to take an active role in instructional reform, putting their own instruction out for public scrutiny.

The experience at Highlands suggests that lesson study also *builds* demand for instructional improvement on the part of teachers, as initially reluctant teachers see the power of joint planning, observation in colleagues' classrooms, careful analysis of student learning, and redesign of instruction. Teachers' desire to improve is stimulated as they see what works well in other classrooms. When you see students in another classroom begin to solve problems by asking themselves what they know, you naturally want your own students to be just as capable.

The desire to improve is also stimulated by seeing what's *not* working. When you realize that the fourth-grader you just observed showed no understanding of concepts supposedly "mastered" in your third-grade class, you want to improve your practice for the sake of your current and future students. As teachers share their observations within a lesson study group and across the school, a sense of shared accountability for instruction grows, and this is often accompanied by a shared enjoyment of the intellectual challenge that instructional improvement presents. As Hurd has noted, "One of the things that I really love about lesson study is that it puts a professional part back in teaching. Like scientists, we can figure things out and get better at them."

What if substantial funding and research were devoted to supporting the demand for improvement that is emerging from teachers like those at Highlands? And what if we could join that funding with ever greater access to high-quality external knowledge? Over the years, waves of funding have emphasized both within-school change and externally designed reforms. But a third path also exists: *locating and supporting demand for instructional improvement and joining it with external knowledge*. A good place to start is with the many schools where teachers are beginning to conduct serious lesson study but may not be in a position to access the internal and external knowledge to do it well.

In Japan, government agencies provide small grants to designated "research schools" that have applied to investigate new directions in curriculum and instruction. Before reforms are promulgated, these research schools use lesson study to invent and bring to life in classrooms their vision of the reform.

For example, when there was a move afoot to remove social studies and science as separate subjects in grades 1 and 2 and replace them with integrated "life environment studies," dozens of Japanese schools applied to become designated research schools for this topic. The primary final product of such grants is *not* a report that gathers dust, but a day of public research lessons in which teachers show how they have chosen to invent the new subject. These settings provide opportunities for hundreds or even thousands of educators and policy makers to see and discuss the lessons, to ask questions, to find out what challenges teachers have encountered along the way, and to share their own views about how the instruction captures or misses the vision behind the policy. Attendees take home a written report that includes not just the lesson and unit plans,

but discussion of the rationale for conceiving the new subject in a particular way, samples of student work over time, and a summary of what was learned.

As in Japan, U.S. schools could apply to be “research schools” in order to study particular educational issues, such as effective strategies for closing the achievement gap. Teachers could be given time and funding to collaborate with outside specialists, to read research, and to bring their collective knowledge to life in the form of public research lessons. Foundations could begin asking for public research lessons as a culminating product of grant-funded work. Such a system would remind us that visions of good teaching cannot just be talk, but must be brought to life by teachers and students. It would also require us to think in new ways about teacher professionalism, accountability, and, perhaps most of all, the connection between research and practice.

1. See Sonal Chokshi and Clea Fernandez, “Challenges to Importing Japanese Lesson Study: Concerns, Misconceptions, and Nuances,” *Phi Delta Kappan*, March 2004, pp. 520-25; Clea Fernandez and Sonal Chokshi, “A Practical Guide to Translating Lesson Study for a U.S. Setting,” *Phi Delta Kappan*, October 2002, pp. 128-34; and Wellford W. Wilms, “Altering the Structure and Culture of American Public Schools,” *Phi Delta Kappan*, April 2003, pp. 606-15. Practical guidance on lesson study can be found in Catherine Lewis, *Lesson Study: A Handbook of Teacher-Led Instructional Change* (Philadelphia: Research for Better Schools, 2002); and Patsy Wang-Iverson and Makoto Yoshida, eds., *Building Our Understanding of Lesson Study* (Philadelphia: Research for Better Schools, 2005). Additional resources on lesson study can be found at www.lessonresearch.net; www.rbs.org; www.tc.edu/lessonstudy/whatislessonstudy.html; and www.globaledresources.com.

2. San Mateo-Foster City School District serves more than 10,000 K-8 students. Its ethnic composition in 2004-05 was 38% white, 30% Hispanic, 19% Asian, 3% African American, 3% Pacific Islander, 4% Filipino, and 3% other. Highlands School’s ethnic composition in 2004-05 was 50% white, 15% Hispanic, 25% Asian, 3% African American, 4% Filipino, and 4% other (due to rounding, these numbers do not add up to 100). Eligibility for free or reduced-price lunch was 31% of district students and 17% of Highlands students.

3. James W. Stigler and James Hiebert, *The Teaching Gap: Best Ideas from the World’s Teachers for Improving Education in the Classroom* (New York: Summit Books, 1999).

4. The SMFC reform coordinator and coaches contacted Catherine Lewis and Rebecca Perry at the outset in order to tap their knowledge of lesson study, which Lewis had been studying in Japan for a decade. Soon after, Lewis and Perry were invited in as researchers to observe the SMFC lesson study teams and provide occasional feedback.

5. The funds used included a combination of public (Eisenhower Grant) money and private foundation funding for the improvement of instruction within a particular group of district schools.

6. James Spillane, “Cognition and Policy Implementation: District Policymakers and the Reform of Instruction,” *Cognition and Instruction*, vol. 18, 2000, pp. 141-79.

7. All quotations are from a planning meeting, 11 November 2002.

8. To rule out competing hypotheses about causes of the increasing achievement, we identified other reform efforts that Highlands participated in

between 2001 and 2005 and identified all other elementary schools (five) that participated in them. Gains in achievement for students who remained at each of these schools for longer than one year were compared with gains for all students who remained in the district. Only one school other than Highlands showed any statistically significant achievement gains relative to the district as a whole, and that school did not show sustained gains over three years.

9. For examples of further resources created at SMFC, see videos by the Mills College Lesson Study Group, Oakland, Calif., “How Many Seats? Excerpts from a Lesson Study Cycle” (2005), “To Open a Cube” (2003), and “Can You Find the Area?” (2003), available at www.lessonresearch.net. See also Jacqueline Hurd and Lori Licciardo-Musso, “Lesson Study: Teacher-Led Professional Development in Literacy,” *Language Arts*, May 2005, pp. 388-95.

10. Antonio Machado, “Proverbs and Songs,” #29, in Betty Jean Craige, trans., *Selected Poems of Antonio Machado*, available at www.cha.uga.edu/bjc/machado.htm.

11. Mills College Lesson Study Group, “How Many Seats?”

12. David B. Tyack and Larry Cuban, *Tinkering Toward Utopia: A Century of Public School Reform* (Cambridge, Mass.: Harvard University Press, 1995).

13. Michael Fullan, *The New Meaning of Educational Change*, 3rd ed. (New York: Teachers College Press, 2001).

14. For descriptions of the other types of lesson study, their systemic impact in Japan, and the role of university-based researchers, see Catherine Lewis and Ineko Tsuchida, “Planned Educational Change in Japan: The Case of Elementary Science Instruction,” *Journal of Educational Policy*, vol. 12, 1997, pp. 313-31; idem, “A Lesson Is Like a Swiftly Flowing River: Research Lessons and the Improvement of Japanese Education,” *American Educator*, Winter 1998, pp. 14-17, 50-52; Tad Watanabe, “Learning from Japanese Lesson Study,” *Educational Leadership*, March 2002, pp. 36-39; and Tad Watanabe and Patsy Wang-Iverson, “The Role of Knowledgeable Others,” in Patsy Wang-Iverson and Makoto Yoshida, eds., *Building Our Understanding of Lesson Study* (Philadelphia: Research for Better Schools, 2005).

15. Catherine Lewis, Ineko Tsuchida, and Samuel Coleman, “The Creation of Japanese and U.S. Elementary Science Textbooks: Different Processes, Different Outcomes,” in Gary DeCoker, ed., *National Standards and School Reform in Japan and the United States* (New York: Teachers College Press, 2002), pp. 46-66; and Catherine Lewis, “What Is a Science Text?,” in Alan Peacock and Ailie Cleghorn, eds., *Missing the Meaning: The Development and Use of Print and Non-print Learning Materials* (New York: Palgrave-Macmillan, 2004), pp. 61-72.

16. For efforts to counter this situation, see Committee for a Review of the Evaluation Data on the Effectiveness of NSF-Supported and Commercially Generated Mathematics Curriculum Materials et al., *On Evaluating Curricular Effectiveness: Judging the Quality of K-12 Mathematics Evaluations* (Washington, D.C.: National Academies Press, 2004).

17. Richard F. Elmore, “Getting to Scale with Good Education Practice,” *Harvard Educational Review*, vol. 66, 1996, p. 4. 

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