Lesson Study in the United States

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The spread of lesson study in the U.S. is a widely acknowledged development. Over the past two decades, hundreds of American teachers have begun to adapt this Japanese professional development process to develop new lessons, use them in their classrooms, receive peer feedback, make improvements in their teaching, and create new instructional practices. As teaching is a cultural activity, teachers are adapting lesson study in a wide range of ways to try to improve teaching (Stigler & Hiebert, 1999).

This discussion begins with a brief review of American teacher professional development and then tries to map the lesson study terrain. Using a variety of knowledge bases, lesson study is described. Then, the small body of case study and dissertation literature is selectively explored. Another phase of lesson study, dissemination techniques, is also discussed. The final section concludes with further thoughts about realizing the lesson study vision for continual improvement in teaching and suggests additional questions about how this knowledge can be extended.

Teachers in the United States are commonly isolated from each other with few opportunities for collaboration where it may be most needed, that is, in classroom practices (Byrum, Jarrell & Ruth, 2002). Of course, it is not unusual for teachers to come together to discuss substantive or problematic issues or to be required to participate in professional development courses related to their practices. Unlike many nations, however, there is no national teacher in-service or pre-service education policy in the United States. Rather, each state has its own policies in such matters as pre-service teacher certification, curriculum, career paths and in-service professional development, with these decisions left to local school districts or even individual schools in some districts (Ball, 2002). Generally, school districts organize and coordinate substantive professional development programmes (Ball, 2002). Thus, for the majority of teachers, professional development has no uniformity of settings, hours, expectations, or courses, and rarely takes into account how they learn. Individual teachers demanding ways to enhance their knowledge and improve their teaching often seek out graduate programs and summer courses on their own. Overall, despite recognition of its importance, the professional development currently available is fragmented, intellectually superficial and woefully inadequate (Boroko, 2004).

In contrast, the Japanese have a more consistent, school-based, professional development system. When a Japanese teacher retires, she may leave a legacy

of lessons and lesson study guides that will be further developed by other teachers. Upon the retirement of an American teacher, lesson plans and practices also retire!

American experience

In 1872 an American, M.M. Scott, went to Japan where he

> demonstrated new, teaching techniques, including what would become Japanese lesson study, at the first teacher training school in Tokyo. (Wilms, 2003: 610).

It was 130 years later before lesson study began to take root in the U.S. Its growth was fueled by the Third International Mathematics and Science Study (TIMSS and TIMSS-R) that, along with publication of *The Teaching Gap*, a book based on TIMSS, revealed stark differences in teaching practices and further suggested that lesson study may improve results. The central argument of this book was that existing teaching practices provided few opportunities for teachers to hone their craft further. The authors motivated educators to take a closer look at Japanese lesson study (Feldman, 2004; Stigler & Hiebert, 1999). Similarly, the Mathematics and Science Teaching report for the 21st Century (U.S. Department of Education, 2000) recommended inquiry groups modeled after Japanese lesson study (Watanabe, 2002).

As interest was stimulated, Japanese-speaking scholars began describing lesson study and focusing specifically on the possible benefits for U.S. teachers and their students. By paying attention to these scholars, Americans learned about many of the merits of lesson study for Japanese teachers. Common sense ways in which lesson study might benefit American professionals were also offered. These articles and conference presentations further fueled interest in the Japanese model of lesson study as a professional development tool, one that built teachers' instructional skills and teacher content knowledge, as well as having the potential to improve experiences provided to students.

In 2002, scholars Lewis and Akiba (2002) conducted the first comprehensive literature review of local lesson study initiatives. At that time, they suggested that it was too early to tell whether a coherent U.S. model could be created. Today, there is a new generation of literature that includes several books, scholarly articles and some case studies of actual lesson study initiatives that have been reported by participant researchers. Dissertations have been written as well. There are two national clearing houses (Lesson Study Research Group http://www.tc.columbia.edu, and the Lesson Study Group at Mills College http://www.lessonresearch.net) that provide information about upcoming open houses, lessons, lesson tools and research studies. Moreover, a national data base has been compiled, and a number of lesson study open houses have been held. It is also possible to purchase commercial Lesson Plan tools that are similar

to the ones used by Japanese teachers in lesson study programs. Founded by *The Teaching Gap* co-author James Stigler, a research-based company uses multimedia technology and training to create electronic communities for facilitating district- or state-wide collaboration (See http://wwwlessonlab.com.) Participants can observe lessons captured on video at any time, making scheduling easier and giving more practitioners access to observations. Anecdotal data about the benefits of lesson study abound. However, outcome data about desirable results are still sparse.

Lesson study web sites provide local lesson study information, tools and data on ways that it is impacting teacher learning and transforming schools. Lesson study is shared in other ways, including local open houses, national subject area (math) open houses and in-house presentations. The content of the representations includes research findings, instructional strategies, stances toward students and teaching, and the concept and process of teacher research. New modes of dissemination generate ways for groups to share experiences and, equally important, they raise new issues which are critical to connect knowledge, power and empowerment, to which we will return later. Now we turn to a discussion of lesson study initiatives, along with features of a small number of case illustrations, both of which open up new possibilities for conversation.

Lesson study initiatives

Lesson study experiments are now being conducted in many parts of the United States. In 1999, there were just two lesson study projects in the nation. One of the first schools to use lesson study was in Patterson, New Jersey, Public School #2 where 16 teachers conducted lesson study in math. In the Delaware Teacher-on-Loan project, one teacher provided five school districts with an overview of the process and then guided practitioners, developed partnerships, and managed an email list (Itzel, 2002). The success of this initiative contributed to the implementation of the state-wide Delaware Writing Project/University of Delaware.

Today, lesson study reaches more than 30 of the 50 states. Prior to 2003, this fragmented, growing network was not documented. Fortunately, we now have data on the growth of lesson study in the U.S. and much of these data are available to the public, as seen in the following table. Many teachers are using this process to build professional expertise and improve instruction through careful lesson planning in a community of professionals (Bass, Usiskin, & Burrill, (Eds)., 2002.). Teachers are also beginning to use job-embedded lesson study to mentor teachers new to the profession.

Table 1: Overview of Lesson Study in the U.S.		
	2003	**2004**
No. of States	29	32
Lesson Study Clusters/ Groups	142	150
Schools	247	335
School Districts	81	125
Teachers	1100	2300
List Serve Members	575+	900+
Research Centres	0	2
Scholarly Articles	Not reported	14

Source: compiled by S. Chokshi. Retrieved March 23, 2005, from http://www.tc.edu/lessonstudy/lsgroups.html.

Chokshi (2002) attributes the spread of Japanese lesson study to "catching on" among practitioners. In other words, a participatory, teacher-controlled, active learning process appeals to teachers' sense of professionalism, enables them to connect teaching and learning in their classrooms and brings forth a context for change.

How should we assess the current state of lesson study? We must first put it into perspective. There are three million public school teachers, over 94,000 public schools, and 14,500 school districts operating in the United States (U.S. Department of Education, 2005). Seen from this perspective, the practice is still quite limited with lesson study involving less than one percent of elementary and secondary schools, teachers and school districts in 2004.

However, lesson study is clearly expanding over a broad area. It is not concentrated in a single type of school, state or district. Groups studying teacher practices range from a few teachers in the same school to school districts and one entire state. Nevertheless, most lesson study groups are composed of teachers in the same school, grade and subject area. These groups are generally small, with over 80 percent of the initiatives having fewer than 30 members who shape a focal question and work together on ways to achieve real-life classroom goals. Most are primary or middle schools; there are virtually no studies of use in United States high schools.

Lesson study includes a range of approaches and initiatives, all of which are grounded in Japanese lesson study. Mathematics lesson study groups predominate, followed by science. Only a small number of districts conduct lesson study in all subjects. Lesson study is also practiced by faculty in ten universities, pre-service mathematics teachers, and special educators at a school for hearing-challenged students. While differences are not sharp, other distinguishing features relate to organization and include diverse partnership arrangements such as critical friend involvement, outside experts, university

facilitators, using school district staff, and independent small groups of teachers creating a community to research their practices and inform change. Groups are also at various stages of the lesson study process -- from newly initiated to implemented and expanding.

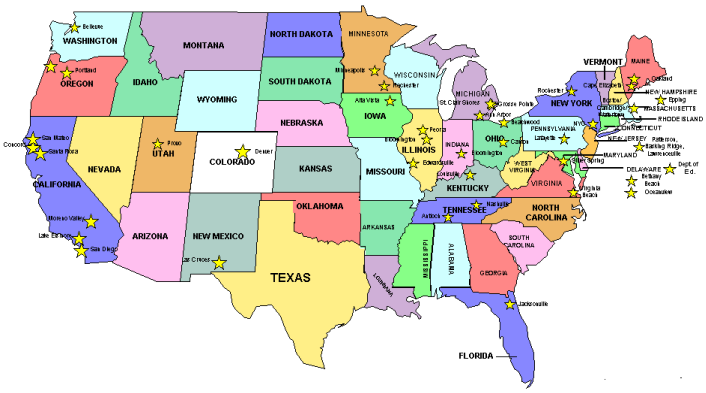
Ways in which lesson study informs practice also merit exploration or, in broader terms, the convergence and divergence of relationships and practices that flow in all directions among stakeholders. Until recently, U.S. researchers, often in collaboration with practitioners, were the main source of lesson study data, along with anecdotal teacher input. Today, it is easier to access local data from lesson study web sites and to draw upon the practices, tools and outcomes that are disseminated to the public and to lesson study researchers.

Using these materials, it becomes immediately apparent that they differ in terms of intended audience, level and type of reported detail. It is also apparent that what is seen often includes descriptions, "how to do" materials and teacher narratives. Digital libraries of video clips with commentaries are also available. Teachers seeking new lesson plans may find them on these sites, although they are not always available to the public. What is not seen often is challenges and evaluations. Taken together, these are formidable obstacles. The positive side is access to a growing number of grass roots lesson study initiatives to which we now turn.

Four types of lesson study groups in the U.S: Local, district, state and university

Some of the sites that we are about to discuss are visible on the map that follows.

Figure 1: Selective Lesson Study Sites Across the United States



Source: Retrieved October 20, 005 from http://cslsp.dreamteamtech.com/default.asp.

Of the many approaches to improving practice that can be discussed here, I begin with teachers engaging in lesson study in local schools or cross-schools

and the concept as implemented by Iowa elementary school teachers from public and parochial schools who, along with university advisors, established math lesson study groups. Their specific aims were three-fold – develop an appreciation of problem-solving as an approach to doing mathematics, facilitate increased student achievement, and enhance professional development. Teachers were encouraged to adjust their beliefs and practices within shared practice experiences.

Each year the Board of Regents of the state of Iowa**,** with support from Loras College**,** the Dubuque Community School District**,** and Dubuque Holy Family Catholic Schools, recruits 48 K-6 public and parochial school teachers (retrieved March 22, 2005, on the web at myweb.loras.edu/lessonstudy/index.html). Lesson study begins with a four day math workshop. The cycle consists of four primary activities -- collaborative planning, teaching and observing, discussing, and revising.

In this process, practitioners learn in context by meeting in lesson study groups for 90 minutes a week and communicating with the full group by email. They keep a reflection journal, and their lessons are videotaped, discussed, and revised. Dissemination is broad by means of a lesson study fair, talks and the Internet.

Ongoing assessment of teacher and student progress is also addressed. Anonymous feedback from teachers includes comments such as **"**Working with others and just talking about math has been great" and " The collaboration of teachers has been great. Working together to perfect a lesson has been an eye-opener." (Willis & Nugent. Downloaded from http://web.loras.edu/lessonstudy). The lasting impact of lesson study, according to the researchers, includes improvements in classroom instruction and changes in teacher attitudes, pedagogy and content knowledge (Ibid.)

Improvement in practice is also developmental. An important feature is that lesson study participants are expected to train additional teachers in subsequent years. The lesson study teams continue to align assessment plans with their School Improvement Plans and will collect additional student achievement data. Professional development grant funds provide teachers with stipends, graduate credit at a reduced rate, materials, travel money and new computer equipment.

In a Laramie, Wyoming, K-9 lab school, middle school and pre-service teachers, along with academics from the University of Wyoming, formed lesson study groups to improve teaching and student achievement. Their main aims were curriculum development and examination of individual students' evidence of learning (Trent, Blum, et. al., 2005). The lesson study group consciously adapted Japanese lesson study to its own needs by taking advantage of available resources, creating flexible procedures to encourage observers to meet individualized student needs during observations, and emphasizing the

importance of student understanding, as opposed to finely honing lessons. Varied observers, including students from other classrooms, special educators, parents, and study group members, were assigned specific tasks while the research lessons were conducted.

As observers, teachers extended learning by "asking individual questions to extend students' understanding, participating alongside students, and intervening, as needed" (Ibid: 54). Pre-service teachers also conducted research lessons. When asked what it was like to participate, teachers indicated the importance of the collaborative, ongoing nature of the process, their central role in improving children's lives and the emphasis on depth over breadth. Close examination also demonstrates that the adapting lesson study required alteration of procedures and addressing issues such as transferability and individual student needs (Trent, Blum, et. al., 2005).

Comparing three district-wide lesson study initiatives in Nashville, Tennessee, Bellevue, Washington, and New York City shows the potential of diverse approaches to alter radically the structure and culture of public schools (Wilms, 2003). For instance, all 4,000 Nashville teachers participate in lesson study, where five half days of lesson study have been expanded to five full days. The approach was derived from three books, *Inventing Better Schools* (Schlechty), *Teaching in America* (Grant & Murray), and *Re-Creating Schools* (Myers & Simpson), and was also developed on the basis of descriptions in *The Teaching Gap*, which was given to each teacher and Assistant Principal so that everyone would be on the same page. (Byrum, Jarrell & Munoz, 2003). In 2002, The Metropolitan Nashville School Board (http://www.shearonforschools.com/Lesson%20Study%20Motion.htm) approved this new initiative to produce lessons and assignments that are more successful at helping students learn the curriculum. Assumptions underlying the model were that teachers are the developers and implementers of lessons and assignments and, therefore, must be the leaders in improving them and be given the time necessary to do so. The teacher-led instructional improvement program produced two products -- lessons (lectures, labs, group work, videos, work sheets, assessments) and assignments (homework, papers, projects, reading, etc.) (Ibid.)

In contrast, the Bellevue, Washington initiative is voluntary. It was implemented to encourage teachers to do excellent work by collaboratively developing lessons and a rich, powerful curriculum (Retrieved March 7, 2005, from http://www.bsc405.org/lessonstudy.html). On Wednesday afternoons, teachers can choose to meet with parents, attend workshops or participate in lesson study. The lesson study cycle is built into their weekly work schedule and includes collaborative planning, teaching, and, as appropriate, revision (Ibid.) Each school has lesson study leaders who meet regularly to bolster their own skills and support teachers. Guidelines suggest that lesson study include a narrative,

assessment, activities, and samples of student work. Incentives include staff development time, financial elements, and teacher training.

Lesson study is situated in teachers' own practice. Teachers join lesson study teams, teach rigorous lessons that are aligned with the curriculum, and reflect upon practice, thereby incorporating inquiry and reflection in their own professional development. These collaborative approaches differ in each school to fit with the individual institution's culture.

Teachers are encouraged to undertake their own research, further legitimizing their role in, and perhaps their commitment to, lesson study processes. They are supported by observation protocols, scoring guides, samples of student work, lesson activities and guidelines, and district specialists. There is also a teacher website to disseminate best lessons, but not all teachers choose to submit their lessons. Those teachers submitting lessons are eligible to receive $1,000 for each lesson published.

"What teachers love is the opportunity to see another teacher teach, the opportunity to just collaborate and bounce ideas off of people, and just how much richer they can create lessons by getting the input of other teachers," says Hurd (Ibid.) They also value opportunities to work together to improve curriculum, instruction and student learning (Phyllis Richardson, on the web at www.bsd405.org/lessonstudy.html). Teachers further suggest that they are thinking in new ways; instead of asking what shall I do today, they ask what do they want their students to learn. One teacher summed up the experience in this way, "It's made us pay attention to everything, because you have to see all the pieces come into focus, and it makes teaching this lesson very rich." Lesson study is changing the district culture, and a new demonstration school is being set up for teachers to observe research lessons. Interestingly, challenges are not mentioned on the site.

In contrast, in New York City Community District 2, lesson study is mandatory. This district has a long-standing tradition of collaboration, and it introduced lesson study as an additional way to improve both teaching and learning and to encourage teachers to generate great ideas and adopt a variety of teaching styles (Kelly, 2002). Training was conducted by lesson study experts and included videos from New Jersey lesson study. District math resource teachers were available to support each school. In this collaboratively focused district where teachers were accustomed to playing a role in their professional development, teachers built lesson study communities and embedded it into their practices and school cultures. Most teachers perceive lesson study as just another professional development tool (Kelly, 2002).

Lesson study can also be top-down or a state-wide initiative, one example being the Delaware Writing Lesson study project. Over the course of ten weeks, teachers meet regularly to plan, review, document and reflect upon their research

lessons. They start with goals that focus on what students should know and be able to do with their writing and what teachers should know and be able to do in their writing instruction and then craft lessons related to those goals. (See http://www.doe.state.de.us/englangarts/dwp.html). Every team is encouraged to teach their research lesson in week four and then reteach during week seven, bringing together several experts to observe their lessons. Fairly detailed protocols are available to support teachers. Videotaping lessons is encouraged. Outlines and lesson materials are published by teachers. Currently, student or teacher outcome data are not readily available.

University professors are also embracing lesson study. The initiative at the University of Wisconsin-La Crosse Project, for example, aims to increase faculty interest, help them develop expertise and assist participants in developing scholarly products, including course materials and teaching practices. During 2003-2004, biology, economics, English and psychology instructors who took part in a research seminar developed and taught their research lessons in the fall introductory courses and retaught them in the spring. Faculty members are supported with training and numerous online resources, including online guides, templates, blog feedback and consultation. A unique aspect of this project is that the findings are peer reviewed. Today, 60 instructors in 30 disciplines are involved in what the web site describes as "the first collective lesson study initiative in the United States, improving teaching one lesson at a time" (retrieved October 24, 2005 from http://www.uwlax.edu/sotl/lsp.)

Looking at these sites provides an overview of lesson study practices, how initiatives are intended to be implemented to change classroom practices and some materials that are guiding teachers to improve instruction. While few constraints are noted and even fewer are discussed in detail, the impact on teachers and their professional growth in these school districts is quite evident. Lesson study is becoming an ongoing part of their daily work and provides them with continuing opportunities to learn and grow with their colleagues as they work together to change classroom practices. To expand this knowledge base, we now turn to several case studies.

Case study overviews

There are at least three case studies in the literature (excluding theses): San Mateo-Foster City, California; Patterson, New Jersey; and Kannapolis, North Carolina elementary schools. These studies range from short to much longer time horizons and use a variety of qualitative and quantitative methodologies. They provide more holistic insights into how and why lesson study works in classrooms and schools from teacher, researcher, student and other stakeholder perspectives at the sites. They offer insight into lesson study as both a practice and a social phenomenon, with inherent values and customs that respond to external influences and offer a window onto the larger culture (Alexander, 2001). They also provide details about the incremental nature of teacher change and

profile ways in which the success or failure results from implementation and teacher perception of the process**.** The two cases summarized below were chosen for what they bring to our understanding of lesson study. In the first case, a New Jersey study, data collected were from observations, field notes, videotaped lessons and artifacts and paint a portrait of what both American and Japanese lesson study can be like and provide in-depth understanding of lesson study across cultures.

Patterson, New Jersey elementary school case study

The original participants in lesson study were 16 volunteers in Patterson School 2, in collaboration with the Mid-Atlantic Eisenhower Consortium and the Japanese School of Greenwich, Connecticut, who began working with lesson study expert Fernandez (1999). Japanese teachers were paid from a grant that was also used to document lesson study implementation. By the end of the second year, lesson study began to spread to other primary and middle schools in the city.

Initially, teachers participated in a three-day seminar where Japanese teachers served as coaches. Subsequently, they formed five mathematics lesson study groups that met two hours per week during the school day to plan lessons. A mathematics facilitator attended these sessions. The project paired teachers with non-teaching partners who covered classes when teachers were engaged in lesson study.

The principal also served on a lesson study team. She defines a supportive principal as essential, "but it goes nowhere without the interest, commitment, and hard work of the teachers" (in Boss, 2001, downloaded on May 8, 2005, on the web at www.nwrel.org/msec/nwerc/lessonstudy.html), and efforts of all players are necessary to improve something as complex and culturally embedded as teaching (Stigler & Hiebert, 1999).

The goal of the case study was to describe the interactions of fifth grade teachers as they developed lessons related to calculating the area of a triangle with advice provided by Japanese coaches who, in turn, gave their interpretations of American teaching. In planning collaboratively, Japanese teachers adopted researcher lenses, while their American counterparts were more likely to focus on the lesson content and learning new techniques. Similarly, Americans were less likely to adopt curriculum lenses than the Japanese teachers. The Americans wanted a topic that was something "we all have to teach" (Ibid: 179), and they did not explore the goal of how to facilitate problem-solving skills. For example, when given sample plans that included information on how triangles and rectangles are taught in other grades and the suggestion to teach the area of a parallelogram before the area of a triangle, the American teachers reviewed materials and decided quickly to teach the "way that the book does it" (Ibid: 187). In a discussion about the best way to present the formula for the area of a

triangle, the Japanese teachers felt that the Americans were confined "by their limited understanding of how to structure mathematical content" (Ibid: 190).

Undoubtedly, these teachers undertook a range of approaches to study student learning and behavior. During live observations, the Japanese teachers took copious notes and functioned as a "set of eyes" on student learning (Ibid: 191). American teachers, consistent with their cultural script, took few notes, preferring to take the "role of another set of hands" and to work with individual children and provide differentiated instruction (Ibid). In one case when American teachers compared actual to anticipated responses, they used the information to revise their lesson but did not take the next step of trying to immerse themselves in ways to facilitate student understanding. They were concerned about student learning, but they resisted new researcher and observer roles.

During reflection sessions, not surprisingly, differing observational perspectives emerged. Japanese teachers tended to think more as teacher-researchers in terms of ways to sequence and connect children's learning experiences to the curriculum. They stressed details and posed very focused questions, such as why teachers used specific types of directions and vocabulary in cases where they considered American directions to be imprecise. Americans, in contrast, were less rigorous in their approaches to collection and analysis of student data, and they sought new pedagogies and practices that could be directly transferred to their classrooms. They did not always refine the lessons or write a report.

Time and again, teachers made sense of lesson study in their own terms, as indicated in the differing ways in which American and Japanese teachers reacted to problem-solving strategies. American teachers were more likely to be reactive and discuss implications, but they were hesitant to take the next step of using findings to assess why children solved problems in different ways. In contrast, the Japanese teachers were proactive. They emphasized that "in order to achieve your goal, all of the lesson plan and the steps must have been successful" (Ibid: 183). American teachers used their experience as practitioners and their craft knowledge, as opposed to grounded observations, to conclude that the lesson objectives had been met.

The strength of this model for professional development, according to the principal, is that it occurs in classrooms and is an ongoing teacher activity. From the teacher perspective, the value of lesson study consistently included learning "from the lesson study experience and working cooperatively" (Ibid). Lesson study not only increases knowledge but also culminates in widespread implementation of transformative strategies and incremental changes in planning and teaching. One teacher described the benefit of examining her practices and opening her classroom in terms of reflecting "more on my teaching, and I am more open to ask for help. I am more aware of and observant on my students' learning or lack thereof" (Sanchez, 2002:9). The research lesson provides a comfortable forum to tackle challenging ideas. However, the authors conclude

that steady improvement and full implementation of the lesson study concept require support from outside experts or knowledgeable coaches for teachers continually to improve teaching and to learn from and in their practices (Ibid).

Kannapolis, North Carolina, elementary school case study

This study describes the effects of lesson study on seven upper primary teachers in a North Carolina suburban school collaborating with university faculty. Outcomes included focused, sustained work, increased confidence and growth in collaboration. Additional benefits included reading and sharing professional literature and encouraging the belief that peer coaching and mediation training would improve the ability of teachers to engage in lesson study (Rock & Wilson, 2005). In this university-school partnership, the team met regularly to design, implement, test and improve their research lessons. University faculty not only helped pilot lesson study but they also documented the implementation process. Two questions drove their study -- how do these teachers perceive lesson study as a professional development process and how will engaging in lesson study affect instruction. A mini-grant from the state of North Carolina was used to pay for professional development experts, substitute teachers and teacher stipends. Participant interviews, field notes and observations, and teacher reflection logs were used to answer the research questions (Rock & Wilson, 2005).

Like Japanese teachers, the North Carolina teachers selected one long-term goal -- to develop "students who are appropriately challenged and motivated to complete excellent quality work" (Ibid: 82). The process included:

- Develop goals, problem statements and a list of questions
- Dialogue to select lessons – use of manipulatives to meet differentiated instructional needs, while a second group chose to investigate differentiated literacy instruction
- Deliver and critique lessons with teachers and critical friends (about two hours) -- commentators helped teachers probe and discuss their observations
- Revise and reteach the lesson
- Present written report to faculty.

The university helped secure resources, substitute teachers to cover classes during lesson study and experts to facilitate differentiated instruction. Available evidence such as "I was amazed how much I learned and will actually use in my classroom" (Ibid: 85) suggest that lesson study increased teacher knowledge and skills and led to changed instructional practices. Teachers also shared that they

> felt more confident now. You always hear about differentiation and things like that and this is my eleventh year, so I have heard a lot... This experience has allowed me to stop, organize it, experiment with it, reflect on it and revise my ideas with help from others and

with the speakers and the research we have explored during lesson study (Ibid: 84).

Differentiated student assignments in math instruction became common. Two teachers indicated that lesson study strengthened their instructional vocabulary, while a third noted that we are "appropriately challenging our students; they are more engaged and successful" (Ibid: 88). On the other hand, inevitable conflicts arose as teachers tried to infuse a "lesson study mentality" into their daily practices. Young teachers also felt uncomfortable critiquing more experienced teachers, expressing different opinions and hurting their colleagues' feelings. As in the other two case studies, teachers cited benefits of lesson study and planned to continue to engage in the process.

Theses

There is another very recent and growing body of literature about lesson study -- lesson study theses.[1] Settings in these studies are mainly the U.S., but at least one is set In Hiroshima, Japan. At least two distinct foci emerge -- case studies of lesson study implementation or exploration of lesson study within professional development. Settings are even more diverse and range from early childhood programmes to primary and high schools to pre-service and in-service programmes. From a disciplinary perspective, math initiatives are the most frequent. For additional information, see the citations in the footnote below.

Lesson study: promises and challenges

[1] Friedman, R. E. (2005). An examination of lesson study as a teaching tool in United States public schools. Authentic instruction: A comparative case study of three urban high schools; Dennis, J. Jo, J. (2005). Lesson Study in the United States context: A case of professional community building; Sotirhos, S.K. (2005). Lesson study in the United States context: A case of professional community building; Ermeling, B.A. (2005). Transforming professional development for an American high school: A lesson study inspired, technology powered system for teacher learning; Pennisi, S.J. (2004). Making improving practice part of teachers' practice in the context of teaching geometry; Greene, K. M. (2004). Professional development in inclusive early childhood settings: Can we create communities of practice through Lesson Study?; Hartman, M. L. (2004). Situating teacher learning in the practice of mathematics and science teaching; Wagner, L. R. (2003). The best-laid plans: Preservice teachers' use of lesson study as a model for attending to students' mathematical thinking; Moore, J. A. (2003). The desire for and design of teacher professional development: A community of practice in the making; Campbell, C. B. (2003). Translating Japanese lesson study in United States high schools; Takahashi, A. (2002). Affordances of computer-based and physical geoboards in problem-solving activities in the middle grades; Kerr, S. J. (2002). Dramatic Educational Contexts for standards-based practice: A handbook for teachers; Cavey, L. O. (2002). Growth in mathematical understanding while learning to teach right triangle trigonometry: Patterns of growth and connection building through lesson plan study; Bordeaux, A. V. (2002). Science education reform for the 21st century: Analyzing policy imperatives for effective teaching through recruitment, renewal, and retention; Yoshida, M. (1999). Lesson Study: A case study of a Japanese approach to improving instruction through school-based teacher development; Liptak, Lynn Ann. (1999). Teachers as researchers into constructivist mathematics learning: Impact on beliefs, practice, and professional interaction in an urban school; Tallin, S. (1993). The evaluation of the Heart and Health Lifestyles program: An informational program for grade 4 students; Harris-Shaprles, S. H. (1983). A study of the "match" between student reading ability and textbook difficulty during classroom instruction.

Increasingly, American teachers and school leaders are engaging in lesson study, and it is making its way into the culture of schools. Typically, in the core features of lesson study, collaborative development of research lessons, teaching, reflecting, revising and reteaching, and disseminating are implemented, often in partnership with experts who support teachers and infuse lesson study expertise and content knowledge. In order to build teacher confidence and competence, diverse support structures and dissemination mechanisms are being put into place to meet teacher needs. These include the provision of technical resources and teacher incentives. Other structural conditions being addressed to empower teachers are training, release time, critical friend support and the supply of substitute teachers. Further common features include giving teachers space to experiment, provision of protocols and tools, and offering platforms for active dissemination and sharing of new lessons, practices and teacher voices.

Lesson study is a deceptively simple concept but a complex process. Indeed, American-style lesson study mimics the surface level features of Japanese models in that it is practitioner-driven, collegial and reflective. In practice, it may put teachers in leadership roles in their professional development, but the process differs in many respects across contexts. Teachers and school leaders often operate with different mindsets and beliefs. District 2 in New York, discussed earlier, for example, is not like lesson study in Japan (Stigler, in Kelly, 2002: 25).

At the same time, there is a vexing absence of data about the factors that contribute to sustaining lesson study and the extent to which teachers, after participating in lesson study, change their beliefs and practices. Similarly, there is little reason to think that key pathways have been identified and incorporated into U.S. lesson study models (Lewis, Perry & Murata, 2004). In Japan, for example, the frugal national core curriculum, text-centered orientation, the routine observation of one another's classes, and collaborative partnerships and processes have all been identified as contributing to the success of lesson study (Watanabe, 2002; Lewis, 1995; Rohlen, 1983). Moreover, Japanese lesson study forums and public lesson study days create a collaborative knowledge base to draw upon and deepen understanding of evidence-based change processes (Fernandez, Yoshida, Chokshi, & Cannon, 2003). While U.S. teachers consistently report general benefits regarding the value of collaboration and improvements in teaching quality, issues such as ways in which the educational system supports the spirit of the lesson study process, how lesson study gets incorporated into practices and which features best support teachers' learning are all vastly underexplored (Hiebert, 1999; Lewis, 2000, 2002; Lewis, 2002; Lewis & Tsuchida, 1998; Lewis, Perry & Hurd, 2004; Fernandez, Chokshi, & Cannon, 2003). Questions relating to use of time, how lesson study fares over time and how it impacts the larger school community are only now being asked.

In the continuing discussion about how lesson study impacts pedagogy, teacher content knowledge and student outcomes, anecdotal data suggest several tentative answers. First, participants develop a sense of mastery, as indicated through comments such as "I have learned so much from the lesson study experience and working cooperatively. This experience has helped me more than just having developed one lesson. It' s really more the lesson study process that's helped me learn" (Fernandez, et. al., 2002). Second, teachers value a high degree of collaboration with their colleagues. It facilitates the emergence of deeper reflection and sharing in a way where every voice is heard, data are dissected, and sealed doors of private isolated classrooms are opened to work together momentarily in meaningful collaboration (Hedman, 2002).

Third, data indicate that engagement in professional development and critical conversations about pedagogy generate new practitioner knowledge and develop an inquiry culture. As a Bellevue teacher explained at the end of a debriefing session, "I learned more in that hour and a half about how to teach writing than I did in four years of college. Here was a group of experienced teachers who had just figured out how to make a difference for their students -- starting tomorrow" (Ball, 2001, on the web at www.nwrel.org/mwerc/lessonstudy.html.) Collaborating to improve teaching is invaluable to personal, social and professional renewal and encourages teachers to think in fundamentally new and different ways (Lewis & Tsuchida, 1997).

It is of critical importance to examine the socio-cultural dimensions that shape teaching and learning in America or what Luke (in press, 2006) calls the complex embeddings and mediations of teaching and learning within cultures and discourses, systems and everyday practices. The American educational culture and time for lesson study are consistently cited as the main reasons why it is difficult to adopt it. Moreover, Japanese practices that include whole class instruction, along with teacher initiated goal-setting, data collection, reflection, collaborative planning and observations, are not common in most American schools, nor is membership in multiple lesson study groups (Lewis, 2002). Similarly, a school-wide focus on teacher-driven improvement is less common in the U.S. than in Japan. Further, most American teachers do not focus on both long- and short-term goals or collaborate to develop, implement and revise their lessons. Put another way, peer observations and use of teacher research and reflective practices to make improvements in teaching are not a consistent part of classroom problem solving and, as is well known, American teachers are resistant to change. The influence of these factors cannot be separated out, presently, in terms of the success of lesson study, implications for change and directions for future research.

Looking toward the future of lesson study in the United States: Designing, researching and sharing

Japanese teachers do not ask whether lesson study is effective; rather, they ask how it can be made more effective (Perry, Lewis, & Akiba, 2002). In the U.S., lesson study is creating a momentum for improvement (Lewis, 2002), with teacher expressed enthusiasm having a ripple effect. Teachers are beginning to recognize that lesson study is not about crossing the finish line, "it's about the run itself" and that the promise of lesson study is improvement in teaching.

As discussed, lesson study is about learning, collaborating, reflecting and sharing practices. Teachers can learn from each other and through collaborations with peers, critical friends and outside experts. Journals are another channel by which foundational and practitioner information reaches wider audiences and gets disseminated into the educational community, although most of these publications are written by researchers for other researchers. Trainers can be hired to facilitate, collaborate in peer review and even to help in publication of lessons (e.g., http://www.freshpond.com/FP_lesson_study_email.pdf). Engaging in diverse online modes of representation is another option, including, at a minimum, bulletin boards and web sites related to lesson study, education and school reform. For example, a National Science Foundation funded web site in Massachusetts not only provides resources but also aims to contribute to the lesson study knowledge base by sharing experiences and research (See http://www.edc.org/cme/WatertownLessonStudy.pdf). Other data bases have catalogues of materials prepared by teachers for teachers and spaces for teachers to add effective strategies (e.g., School Renewal Web Center at http://www.schoolrenewal.org or Vancouver's catalogue at http://www.bctf.ca/LessonAids/#catalogue). As mentioned previously, practitioners and researchers also have access to two national clearinghouses and lesson study open houses to share practices and research wider audiences. Creating a profession in which teachers have the opportunity for continual learning and sharing this knowledge can inspire greater achievement for children (Darling- Hammond, 2003).

The Japanese have institutionalized three ways to share lessons and go public – reports, open houses and lesson study handbooks. At this point in time, voices of Japanese teachers are loud and clear, but American teacher voices are underrepresented. They do not have such wide access to direct lesson study reports nor a repository of professional knowledge. While their numbers are growing, outside of schools and conferences they must transcend gate keepers in efforts to reach multiple audiences. If teachers who come to reflect and then share their interpretation of their practices and collective knowledge can start to have even wider conversations with other practitioners about improving practices, the roles of practitioners can be reshaped still further as schools improve from within.

Those involved have suggested reasons why lesson study is working in the United States. It is a common sense idea that fits well into U.S. thinking about educational reform. Lesson study professionalizes teaching through its focus on

improving teaching practice, with teachers controlling their own professional development through concrete, classroom-based activity. At the same time, there are obstacles to its wider-scale adoption and dissemination. In particular, lesson study does not bring quick results. Rather, getting to the soul of lesson study requires teachers to make a commitment for the long haul (Ibid). This sentiment is aptly echoed by Principal Ruth Friedman (Downloaded October 20, 2005 from http//:www.beachwood.k12.oh.us):

> I wish we had known how difficult it would be to sustain the initiative over a period of two/three years. Teachers move in and out of subjects each year. Therefore, a lesson plan between two teachers created, taught, video taped and revised during one year, may not be applicable the next year with a different set of teachers. The question remains in what ways lesson study will continue to grow and flourish across the United States and how practitioners across the nation will benefit from changes in school ethos and teaching as more reflective practice.

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Appendix A
Selective Lesson Study Links in the U.S.

NATIONAL LINKS

Bellevue (Washington) Lesson Study Project
Columbia University Lesson Study Research Group
CEMI Lesson Study Project (Indiana)
Colorado State Lesson Study Pilot Project
Delaware Department of Education
Global Education Resources
Lessonlab (Stigler et al)
Lesson Study Project at EDC
Lesson Study: Science Education
Mathstar Lesson Study Project at New Mexico State
National Staff Development Council
Paterson (N.J.) Lesson Study Project
The Polished Stones (video)
Puerto Rico Statewide Systemic Initiative
Research for Better Schools Lesson Study Resources
School Renewal Web Center: Lesson Study Forum

IOWA LINKS

Iowa AEA 1 (Keystone)
Iowa AEA 9 (Mississippi Bend)
Iowa AEA 10 (Grant Wood)
Iowa AEA 11 (Heartland)
University of Iowa Lesson Study

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Organizations

American Educational Research Association
AAAS (American Association for the Advancement of Science) Project 2061
California Science Project
Child Research Net
Cody's Science Education Zone
Council for Basic Education
CCSSO (The Council of Chief State School Officers)
EDC (Education Development Center) Lesson Study Project
ENC curriculum and professional development materials
Global Educational Resources
Lesson Study Forum, School Renewal Web Center
Lesson Study Project - University of Wisconsin - La Crosse
Lesson Study Research Group at Teachers College, Columbia University
List of Schools and Organizations participating in Lesson Study
List of Researchers participating in Lesson Study
Mathstar Lesson Study, New Mexico
Mid-Atlantic Eisenhower Consortium for Mathematics and Science Education
National Center for Education Statistics, International Comparisons in Education
National Science Foundation
Oakland Unified School District, CA - Lesson Study in History-Social Studies
TIMSS (Third International Mathematics and Science Study)
Resource Center
http://www.lessonresearch.net/res.html