
Preface

The purpose of this book is to share our work in building lesson study communities in the United States, how we created successful lesson study models, the many barriers we encountered and mostly overcame, and how you might want to use lesson study to address learning problems in your own schools. The work should be especially useful for two reasons. The results of lesson study over the last 5 years include demonstrated success in using lesson study for enhancing teacher quality and improving student learning and accomplishment. Descriptions of how we achieved this success are woven throughout the book. The second unique feature is that the lesson study teachers and students with whom we have worked come from among the most poorly served schools and communities in the United States. As Linda Darling has written, poor schools often have the newest and most inexperienced teachers with the least professional development.

The successful use of an unusually rich kind of teacher-directed professional development with primarily Hispanic and Native American teachers and students in poor communities, and the resulting success of their students, bode well for the use of lesson study and its possible modifications for addressing a currently pressing problem—how to close the achievement gap. Ethnically and linguistically diverse students have remained at the bottom in achievement in the United States. However, recently released results of a new state-required, criterion-referenced test in New Mexico show that fourth graders in the 95 percent Hispanic and low-income Gadsden district scored as well, on average, as all fourth graders in the state. Further, a recently completed National Science Foundation (NSF) study—examining possible connections between teacher professional development and student achievement—showed that the most significant predictor of students' achievement is whether or not their teachers had been involved in collaborative lesson and curriculum planning (Wiburg, 2005).

It is worth noting that the ways in which we conduct lesson study in the United States are grounded in a culturally responsive approach to teaching and curriculum that particularly addresses the challenges schools face as a result of the changed demographics of their students. We are dedicated to providing expanded learning opportunities for all students, especially those who still remain behind. Our work has been successful in many ways in addition to those recently reported in 2005 test data.

- An outside evaluator involved in the initial MathStar project reported that all teachers in the project reported expanding their teaching strategies to involve more students.
- Increases in mathematics test scores are also being reported for students whose teachers participated in lesson study. For example, in one dual-language elementary school located near the Mexican border, 76 percent of the elementary school students scored at or above proficiency in mathematics in 2004. (This competence was far above the state average for both Hispanic and Anglo/White students, which is around 50 percent.)
- Middle school students in a 98 percent Hispanic border school district with large numbers of English Language Learners have raised their mathematics achievement from 1999 (when only 8 percent of middle school students demonstrated proficiency in mathematics) to around 40 percent of the students in this school being at or above mathematics proficiency in 2004.

Why lesson study? First of all, it is based on an understanding that teaching and learning are cultural activities (Stigler & Hiebert, 1999). We believe that only by addressing the culture of teaching and learning will we be able to change the system in such a way that many more children succeed in school. There have been many efforts to reform mathematics and science education. However, the achievement gap in many cases remains the same. It is important to recognize that math and science classrooms have not always been perceived as engaging and exciting learning environments by non-mainstream children. Perhaps more important, teachers have not been fully included in educational reform efforts and have not been assisted in thinking about what students are learning or not learning from their teaching. Successful reform focuses on what teachers and students are expected to do in classrooms, and lesson study, with its focus on student learning, is an ideal model of professional development for educators interested in improving student achievement. Change, in order to be successful, must be driven by teachers and

based on instructional decisions. What at first appears to be a slow educational reform process—the involvement of teachers in substantial study of their students, their lessons, and their students' learning—may turn out to be one of the most effective ways to reenergize learning in classrooms.

For us, the decision to introduce lesson study grew out of our frustration during the second year of the implementation of a mathematics reform grant, when the work we had been doing seemed to be making no changes in classrooms. Even though teachers in this initiative had attended two summer institutes and evaluated them highly, we were seeing no changes in practice when visiting classrooms. We found no changes in the way teachers were teaching or students were learning mathematics, even when we thought we had taught them the tools and strategies we thought they needed to improve mathematics learning.

During the spring of 2001, we read Stigler and Hiebert's (1999) book *The Teaching Gap*, which illuminated the differences in the culture of teaching mathematics in Japanese classrooms as compared to American classrooms. The book is based on the international TIMMS study, which compared student performance in mathematics in the United States, Germany, and Japan. The TIMMS study captured, through video, the differences in teaching in these countries, and the authors concluded that the differences in teaching cultures within a country were far less than between countries. Stigler and Hiebert (1999) introduced the professional development form most used by elementary mathematics teachers in Japan, which has been translated as lesson study. In Japanese, this term means a teacher-led investigation of how the lesson went, what students were still having trouble learning, and how the lesson could be modified to improve learning.

In spring 2000, we decided we were no longer going to “do things to teachers,” and from this point forward our staff and faculty committed to co-constructing professional development with teachers. The problems we would address would be “our problems” and we would find the solutions to students' learning difficulties together. The following is a quick overview of the chapters in this book. When appropriate, the voices of leaders and teachers involved in the practice of lesson study are introduced in order to make this work as rich as possible. Each chapter ends with some questions designed to extend the reader's understanding of the chapter's concepts. These extended learning exercises are intended for use by groups of teachers and/or administrators who are reading this material together. These questions can be discussed in person or by using a bulletin board or a discussion space on the Web.

Chapter 1, *Translating Lesson Study From Japan to the United States*, introduces lesson study as it began in Japan and has since been

introduced in the United States. Some of the common barriers to doing lesson study in this country are described. Principles that address the solutions to these barriers through well-grounded lesson study are introduced, with the aim of building a framework for the practice of lesson study in schools in this country.

Chapter 2, *Building Successful Lesson Study Communities*, describes the initial MathStar model and then introduces several different types of successful lesson study communities. Because of some of the differences between Japanese education and the diversity of American education—as well as the diverse communities it serves—differences in the types of lesson study communities have emerged naturally over the last few years. These communities include teachers involved in state or multistate grant projects; whole-district or whole-school lesson study; lesson study as it might be used to integrate content learning and teaching; and the development of lesson study by teachers for their own teaching. This chapter also suggests how lesson study can be empowering to teachers and students working in bilingual or multilingual classrooms. The chapter closes with a description of lesson study as used in a largely Hispanic U.S.-Mexico border district.

Chapter 3, *Assessing Your Readiness for Lesson Study*, introduces ways to consider whether you and/or your school are ready for lesson study. A desire to begin doing lesson study sometimes occurs from the need to simply do things differently, because what you have been doing in terms of increasing student achievement has not been working. Occasionally, lesson study is introduced in a top-down fashion, and at other times it emerges from teacher work at the grassroots level. Traditionally, lesson study advocates have said that it is important for teachers to introduce this process. Yet, in some of our examples, lesson study succeeds even when introduced in a top-down fashion and then followed up by providing teachers opportunities to develop ownership of their work. This chapter articulates a set of threshold conditions in schools, which can contribute to a successful lesson study program. Lesson study by itself is not a magic bullet and cannot change student learning without a schoolwide effort to also align teaching, assessment, and the use of quality materials with high-level content standards.

Chapter 4, *Connecting Instructional Goals to Lesson Study*, is organized around teacher groups engaging in processes that ensure lesson study is connected to each school's and/or district's educational aims and instructional goals. Most schools, faced with the high stakes involved in accountability pressures, can't afford to try new forms of professional development if they are not directly connected to each school's learner-based improvement plans. What connects a

school's plan for improvement to teachers' professional development is the use of an overarching goal, which guides the work of every teacher group. Even though teams may be at different grade levels or work at opposite ends of the state or nation, they need to find a way to develop for themselves an inclusive overarching goal. There are also subgoals that need to be developed related to content, units, and research lessons. These subgoals relate to what kinds of people we want our students to become; to what learning strategies are appropriate in the discipline being learned; and to what we want students to know and be able to do as a result of the units taught. The beauty of lesson study is that the teachers, who are responsible for the implementation of improvements in instruction, are also responsible for creating these goals and the ways in which they can be met in the classroom. The process for doing this is explained in Chapter 4.

Chapter 5, *Designing the Research Lesson*, provides example cases around teacher team building during the lesson study process, as well as documents the support required for getting started by using specific templates and assistance from outside experts. The research lesson is a window into the work that teachers are doing to improve student learning. Groups of teachers collaboratively plan a lesson that is carefully designed to answer specific questions about student thinking and learning. The lesson is taught by one of the group members and observed by the others. After the lesson, the group convenes to discuss the observation and its effectiveness in meeting their goals. They revise the lesson based on their learning, and the lesson is taught a second time. The format of the research lesson is not typical of U.S. classroom instruction. Special attention must be given to student thinking, teacher responses, and data collection. The research lesson should not be confused with traditional individual teacher lesson planning.

Chapter 6, *Reflecting on and Sharing Your Research Lesson*, illustrates how the lesson study process is most successful, both for individual teachers and teacher groups, when the lesson study process includes a public sharing of lessons learned. Many teachers are not used to seeing themselves as professional researchers who can contribute to improvements in education. Nor are they used to working collaboratively with other teachers in order to build knowledge about teaching and learning. Care must be taken when it comes to understanding the level of intensity required by lesson study. An experienced mentor can help teacher groups and schools to move through what is often initially a frustrating process. Some questions to be considered are: How many members are too many? Can a team span grade and subject levels? Should team members all be located at the same school? How can teachers learn to be critical friends in terms of practice, while

still remaining respectful of each other? There is also the issue of group working practices and the facilitation of communication.

During this sharing phase, teachers “consolidate the learning” that occurred during earlier stages and take a professional step in organizing this learning in a way that can be demonstrated and shared with other members of the education community. This sharing may take the form of demonstration lessons, conference presentations, and/or research reports, and can be done on a schoolwide, districtwide, or state or national basis.

Chapter 7, *Integrating Lesson Study With Existing School Initiatives*, responds to the common problem of how difficult it is to add anything new to the already overcrowded curriculum and the daily work of teachers and administrators. The chapter includes three models that have been used to integrate lesson study into existing school initiatives and describes how implementing lesson study in the United States can strengthen already ongoing work for improving student achievement. Examples are provided that suggest how to begin lesson study and lessen the possible resistance to change that might occur in school communities. These models are explored in depth in this chapter, concluding with such practical information as the people and processes required for each approach.

The Resources can be used to help you implement Lesson Study in your school. They include an example of a problem-based lesson; specific and detailed guidelines for steps of the lesson study; and professional development workshop guidelines.

Acknowledgments

The original group who introduced lesson study in New Mexico consisted of an education professor, Karin Wiburg, a doctoral student in mathematics, Jeff Hovermill Samatha, three math professional development specialists (Wanda Guzman, Lisa Snow, and Cathy Kinzer), and a technical team (Kalle Joregensen and Jennifer Villa), who had received training in videography from the Lesson Lab Group. Kalle videotaped the lessons, teacher interactions, and interviews, while Jennifer provided the Web-based support necessary to do lesson study at a distance in the rural Southwest. Other professional development experts at our university and in school districts soon extended lesson study beyond mathematics learning into their own work in science (Susan Brown); bilingual education (Rocio Benedicto and David Rutledge); and as an integral part of a statewide technology

integration movement (Susan Bussmann and Karen Trujillo). Over the past 2 years, as part of a new Math Science Partnership (MSP) grant, eight university mathematicians have joined our learning group and helped to integrate a deep understanding of content with pedagogy. This book is dedicated to the New Mexico Learning Collaborative, the professors and teachers who are committed to providing the diverse students of the Southwest with the best possible learning opportunities. It is also dedicated to the 24 original math teachers throughout New Mexico, in tiny towns and larger cities, who decided to give this process a try in 2001, as well as the more than 250 teachers who have worked with us over the last 6 years.

Contributing Authors

We would like to thank the following members of our group who wrote additional material that has enriched this book:

- Jeff Hovermill Samatha is currently a mathematics professor at Northern Arizona University, who is continuing his lesson study work in Arizona, including work with Navaho teachers. He is the primary author of Chapter 6, on extending and sharing lesson study.
- Susan Bussmann and Karen Trujillo, project directors of recent lesson study projects, contributed practical models for integrating lesson study with other school reforms in Chapter 7.
- David Rutledge, an assistant professor of curriculum and learning technologies at NMSU, and Rocio Benedicto, who coordinates programs for Latino families and students, contributed information in Chapter 2 on how lesson study could help bilingual teachers and students.

Additional Acknowledgments

Thanks to Stacey Duncan and Liz Parra Kriegel for final editing and formatting. Appreciation to Frannie Dever, mathematics district expert, who made lesson study the form of professional development in the Albuquerque schools.

Thanks also to two principals, Cindy Chapman and Sharon Duncan, in the Albuquerque and Gadsden schools, respectively, who made their institutions whole-school lesson study schools. A special thanks to Akahiko Takahashi, who agreed to write the Foreword and

who has helped us with lesson study several times over the years, including helping us with our first public lesson in a 95 percent Hispanic school district.

Corwin Press gratefully acknowledges the contributions of the following reviewers:

Gail Derrick
Associate Professor
Regent University
Virginia Beach, VA

Jenny Sue Flannagan
Elementary Science Coordinator
Virginia Beach City Public Schools
Virginia Beach, VA

Antonette W. Hood
Assistant Professor
California State University, San Marcos
San Marcos, CA

Thelma A. Davis
Coordinator, K–12 Mathematics and Science
Clark County School District
Las Vegas, NV

Patricia B. Schwartz
Principal
Thomas Jefferson Middle School
Teaneck, NJ

Catherine Lewis
Distinguished Research Scholar
Mills College
Oakland, CA

Sonal Chokshi
Director of Lesson Study
Community Outreach
San Jose, CA

Vernet C. Nettles
Education Specialist
Alabama State Department of Education
Montgomery, AL

Clea Fernandez
Teachers College–Columbia University
New York, NY

Kathy DiRanna
K–12 Alliance Statewide Director
WestEd
Santa Ana, CA

Pam Hankins
Staff Development Specialist
Springfield Public Schools
Springfield, MO