

FROM JAPAN TO THE UNITED STATES: AN INTERVIEW WITH CATHERINE C. LEWIS ABOUT LESSON STUDY

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Yuriko Yamamoto Baldin¹

Maria Alice Veiga Ferreira de Souza²

Catherine Carol Lewis³

Our motivation for the interview

Catherine Carol Lewis is a researcher at Mills College in Oakland, California, who first demonstrated the impact of Lesson Study for American elementary school teachers and students. Following this path and promoting this Japanese way of training teachers, Lewis wrote the book “Lesson Study Step by Step: How Teacher Learning Communities Improve Instruction” with co-author Jacqueline Hurd. The content of the book led the organizers of the II International Seminar on Lesson Study in Mathematics Teaching (SILSEM) – Profa. Dra. Adriana Richit, Prof. Dr. Dario Fiorentini e Profa. Dra. Regina da S. Pina Neves – to invite her as a speaker at the opening of that congress and, as editors of this thematic issue, they asked us for an interview about Lesson Study.

Specifically, our interest – teachers and researchers Yuriko Y. Baldin – PhD in Mathematics – and Maria Alice Veiga F. de Souza – PhD in Mathematics Education – in Japanese education has intensified during the last decade in the face of notable differences between Japanese educational culture and that of other countries, especially Western countries. We want to hear about Lewis' experience and inspire readers to promote educational projects for Latin American countries, especially Brazil. The particularity of Brazil is because it is a country of continental size, like the USA, with states and territories with different cultural backgrounds and profound social differences. Differently, but equally significantly, is the case of Latin American countries, which are politically independent of each other but share a

¹ Doutorado em Matemática pelo IMECC-UNICAMP. Professor do Departamento de Matemática/CCET/UFSCar. E-mail: yuriko@ufscar.br – ORCID: <https://orcid.org/0000-0001-7473-5657>.

² Doutorado em Psicologia da Educação Matemática – Universidade Estadual de Campinas. Professora do Instituto Federal do Espírito Santo. E-mail: alicevfs@gmail.com – ORCID: <http://orcid.org/0000-0003-2038-813X>.

³ Mills College at Northeastern University. E-mail: cclewis150@gmail.com – ORCID: <https://orcid.org/0000-0002-0557-0876>.

common language and similar cultures. In this sense, Lewis' experience with the Lesson Study in the USA since 1993 is the focus of our interview, which we will begin.

The interview

YYB & MAVFS - What was your primary motivation to learn about the Japanese Lesson Study? When and how did you accomplish your studies on Lesson Study?

LEWIS - I was sitting in Japanese elementary classrooms for many months, to write a book on Japanese classroom management. It focused on how teachers nurture children's friendships, enjoyment of school, leadership, and sense of responsibility to the school community. My focus had nothing to do with mathematics or science. But suddenly, I was learning so much math and science, even in elementary school lessons! The lessons were leading me to understand math and science in new ways. I suddenly understood pi (π) as the ratio of circumference to diameter –not just as 3.14159... – a number to be memorized. After students studied levers, I suddenly noticed levers everywhere in my daily life and couldn't help thinking about how to use them efficiently. When I asked teachers how they learned to teach such powerful lessons, they said "Lesson Study." So, I asked to observe Lesson Study. First, I observed Lesson Study in schools, and later large public research lessons in districts and as part of national associations (such as mathematics teacher associations). I observed the process and questioned teachers about its impact on them. When I told Japanese teachers that U.S. teachers did not practice Lesson Study, they expressed amazement: How can teachers improve teaching without some process like Lesson Study, where teachers jointly observe and discuss live instruction?

YYB & MAVFS - We would appreciate listening to your opinion about the implementation of LS in the U.S., concerning different dimensions of such implementation for "the improvement of the students' learning": a) research for educational investigation; b) teacher education (initial and professional development); c) pedagogical aspects (from didactics).

LEWIS - In Japan, the term for Lesson Study (*jugyou kenkyuu*) simply means "instructional research." [Note from the interviewers: The simplicity of the words translated often causes a misinterpretation, bringing the focus of Lesson Study heavily on *the observation of the instruction done in classrooms*, whereas *the initial research on the content and the curriculum* to be worked inside a lesson plan may be neglected or oversimplified.] Outside Japan, Lesson

Study is most often thought of as teacher learning – for both practicing teachers (Fernandez and Yoshida, 2004) and preservice teachers (*e.g.*, Dotger *U.*, 2023; Kawaguchi & Watanabe, 2021; Lewis, 2019). But in Japan, Lesson Study is also regarded as a way to build knowledge about student thinking, effective pedagogy and effective curriculum (Lewis & Tsuchida, 1997; Takahashi, 2021; Watanabe, 2014) – goals often pursued by educational researchers outside Japan, but more commonly pursued in Japan through the collaboration of school-based and university-based educators.

YYB & MAVFS - Considering your amazing experience in Japan observing the Lesson Study procedures in real classrooms with Japanese teachers, what aspects and principles caught your attention to be brought back to U.S. professional learning?

LEWIS - Several things struck me as very powerful in Lesson Study compared to U.S. professional learning for teachers. First, the focus of Lesson Study is on students – including careful observation of what students actually think and do during instruction. Too often in the U.S., we focus on “best practices” for teachers without observing how these practices actually work for students in a school. I was struck by the power of observing students carefully during lessons, yielding insights into what makes a “research-based” practice succeed or fail for students in a given setting. Second, I was struck by the power of collaboration among teachers. When teachers work together with a shared long-term vision for students, practice becomes much more coherent at a school. Students no longer bounce from a teacher who expects student-led problem-solving to a teacher who expects the reproduction of teacher-demonstrated methods. Teachers support each other, learn from each other, and begin to talk about “our” students, not “my” and “your” students; teachers begin to expect colleagues to use coherent practices across a school. Third, I was struck by the feelings of power and efficacy lesson study nurtures in teachers. Teachers are researchers, figuring out how to improve instruction. Teachers are authors of knowledge for the educational profession.



Lewis: in 1993, my family accompanied me to Japan, where I observed in Japanese elementary schools for many months, focused on students' classroom management. Yet I learned so much mathematics and science! That led me to the source of the good teaching—lesson study.

YYB & MAVFS - What were the main obstacles and first difficulties in implementing Lesson Study groups in your local context? How did you and your group overcome them?

LEWIS - Many U.S. educators thought that U.S. educators cannot learn from Japanese educators because our cultures are too different. But some U.S. educators tried Lesson Study, and other U.S. educators observed them in person or on video and became convinced of the power of Lesson Study. I feel very grateful to those early U.S. practitioners of Lesson Study who were willing to try a practice from Japan. Their videos inspired many U.S. educators to try Lesson Study (LSGAMC 2020a, b).

A second obstacle was understanding that Lesson Study is a tool for improvement, and it needs to be joined with sound educational resources. Often, that means going beyond the content discussion and educational vision found in the Teacher's Edition of U.S. textbooks. We often draw on Japanese textbooks. For example, Japanese mathematics textbooks Teachers Editions help teachers understand the various student ideas (including mistakes) likely to arise when a problem is posed and suggest how those ideas can be used in class discussion to support the development of student thinking. In contrast, a U.S. Teacher's Edition is likely to give just one correct answer. (Lewis, Perry & Friedkin, 2011). Japanese textbooks have been revised to reflect learnings from lesson study, so they include powerful representations and problems likely to support student thinking (Takahashi, 2021; Watanabe, 2014). For example, fractions representations in Japanese textbooks help students grasp fractions as *numbers* with size on a number line, not just as countable *pieces* of a discrete object. We confronted this problem by developing mathematical resource kits to support lesson study. You can see an example for fractions online (LSGAMC 2020c). We confronted the larger problem of the vision of

mathematics learning by developing many resources on Japanese-style Teaching Through Problem-solving. You can find these resources at (LSGAMC 2020d) and a course to introduce Teaching Through Problem-solving at (LSGAMC 2020e). Teams randomly assigned to Lesson Study Supported by Mathematical Resources showed a significant impact on both student and teacher learning (Lewis & Perry, 2017).

A third obstacle was that many initiatives are implemented “top-down” in the U.S., whereas Lesson Study requires teachers to take leadership. Administrators have a crucial role to play as cheerleaders and protectors of teachers’ time for Lesson Study and as finders of high-quality resources to support a powerful educational vision. But if administrators take too much leadership of Lesson Study, teachers will not be able to discover joy and power as researchers of learning and will not be motivated to continue.

YYB & MAVFS - The U.S. is a huge country consisting of states and territories that have autonomous education policies, though under common federal rulings and different cultural backgrounds. From your pioneering experience in implementing Lesson Study groups in school contexts of Western culture, how does your example in the state of California relate to the initiatives of establishing Lesson Study in different states of the U.S.?

LEWIS - One advantage of a huge country with autonomous states is that we have many natural variations on Lesson Study, and we can learn which ones are effective. For example, a study of about 50 school districts in Florida found that the districts that allowed sites and educators to “own” lesson study rather than requiring fidelity to a district-dictated model were more likely to sustain Lesson Study after funding and mandates ended (Akiba *et al.*, 2019).

One disadvantage of the autonomy and variability in the U.S. is the difficulty of sharing Lesson Study resources and models due to differences in curriculum, standards, and scheduling. For example, materials for school-wide lesson study developed at one site may not fit the calendar, standards, or curriculum at another site. To adapt Lesson Study to various sites, educators must understand the vision of teachers’ learning underlying Lesson Study. Adaptation always brings a risk of “lethal mutation”. For example, a site whose schedule does not permit live observation of a research lesson might try video review – but find that it fails to build some key underlying mechanisms of Lesson Study, such as developing teachers’ trust in one another and teachers’ skill at observing students.



Lewis: 2006 presentation at Tsukuba University, showing video “How Many Seats?”, which features one of the first U.S. lesson study groups. The audience is international delegates to APEC (Asia Pacific Economic Cooperation). Interest from educators around the world has supported lesson study.

YYB & MAVFS - How do you evaluate the present situation of the dissemination and the impact the Lesson Study groups are making in mathematics classrooms and teacher education programs in the U.S.?

LEWIS - Somehow, when I heard this question, a Japanese phrase *mada mada* (not yet, not yet) came to mind. We are still very far from the situation in Japan, where new teachers typically enter schools where they become part of a school-wide vision they enact and improve through Lesson Study. In Japan, novice teachers learn with more experienced colleagues how to study teaching materials, anticipate student thinking, and carefully observe students. Also, the U.S. is far from the situation where professional organizations, funding agencies, and educational agencies all include public research lessons as a key part of their work. The attitude in Japan seems to be: Educational documents are just splashes of ink on paper until teachers bring them to life in research lessons. In the U.S., sadly, too many organizations are still content to simply share educational ideas on paper without bringing them to life in a classroom for all to see and discuss.

YYB & MAVFS - What suggestions or advice can you give us in the process of implementing the Lesson Study project in Brazil and Latin American countries to promote the effective development of mathematics education with quality teachers educated through Lesson Study for the learning of the students?

LEWIS - First, nurture teacher leadership of Lesson Study. Make sure Lesson Study becomes a place where teachers can remember the long-term hopes that brought them into teaching—hopes like wanting to nurture students’ mathematical enjoyment, curiosity, and power. And make sure Lesson Study responds to teachers’ basic human needs for belonging, agency, and

competence – that Lesson Study becomes a place of collegueship, learning, and efficacy for teachers. Don't forget to celebrate even the smallest steps in building your teacher community! Find powerful resources for teachers to study during the first phase of the Lesson Study Cycle – resources that will delight teachers with new insights about content and student understanding of the content. Finding just-right resources – that are interesting and useful to teachers and do not feel like a waste of their valuable time – is one of the most important jobs of university-based collaborators.

See Lesson Study as a means to build mathematical equity. We can only support equitable learning if we can see the learning of every student as it's occurring, so we understand what is working for them and how we might redesign future instruction. I'm not aware of any other approaches to building mathematical equity in elementary school that have the power of Teaching Through Problem-solving supported by school-wide Lesson Study (Lewis *et al.*, 2022).

YYB & MAVFS - Thank you very much, Catherine, for an enlightening and inspiring talk. We would much appreciate registering your last messages to our readers.

LEWIS - Work patiently, with a long-term perspective. Most successful sites in the US started with a small group of volunteers and grew slowly. After several years of building the power of their own practice using Lesson Study and Teaching Through Problem-solving, these volunteers reached out to colleagues.

Don't expect immediate success. Most sites that embraced school-wide Lesson Study and mathematics Teaching Through Problem-solving showed a *decrease* in test scores the first year and then showed strong improvement in test scores in subsequent years. So don't expect immediate positive change in test scores. It's typical for test scores to temporarily decrease when teachers are making a dramatic change in their teaching. (It's called an "implementation dip" Fullan, 2002.)

Pay more attention to the underlying principles that make Lesson Study successful than to the surface features of Lesson Study. Notice whether teachers are building habits of inquiry, collaboration, study of mathematical resources, anticipation of student thinking, and careful observation of students. These habits can be built in ways appropriate to your setting, providing the foundation for later Lesson Study. For example, at Muir School, teachers developed a school-wide vision and conducted classroom inquiry using school-wide prompts before moving on to full-fledged Lesson Study (Lewis *et al.*, 2022, 2023).

Reflect on your emerging work and whether it is nurturing the conditions that will make it successful, such as trust among teachers, the study of teaching materials, and careful observation of students. Several sets of available reflection questions can help you think about this (2020f). Pay more attention to these underlying transformations than to the surface features of Lesson Study.

Immerse yourself in the videos and stories of other educators that have built Teaching Through Problem-solving and Lesson Study successfully at their sites. For example, you can read about Muir School (Lewis *et al.*, 2022, 2023), see video from a large public research lesson (LSGAMC, 2020g), and study Teaching Through Problem-solving lessons from many teachers across the U.S. (LSGAMC, 2020h).

Prof. Dr. Catherine C. Lewis's brief curricula

Catherine Carol Lewis earned her B.A. degree in 1972 from Harvard University and her Ph.D. degree in Developmental Psychology from Stanford University in 1979. She has held the position of Distinguished Research Scientist, at Mills College School of Education, Oakland, CA, U. S., from 1999 to date. Her career includes positions as Visiting Professor at Tokyo University School of Education, in Japan in 2003, Director of Formative



Research, at Developmental Studies Center, Oakland, CA, U. S. (1988-1999), Adjunct Assistant to Associate Professor and Research Psychologist, Pediatrics and Psychiatry, University of California, San Francisco (1981-1996), Congressional Science Fellow, Legislative Staff to the U.S. Senate Subcommittee on Child and Human Development (1980-1981), and Researcher and Translator, Japan Research Institute, Tokyo, Japan (1972-1974). She has contributed to the implementation of school-wide lesson study in the U.S. since the years 90s and has published literature with more than 20 selected papers and books on the theme of Lesson Study. Her synergistic activities have been highlighted as (2006-present) Research-based mathematical toolkits for lesson study on topics including fractions, area of polygons, and proportional reasoning at (<https://lessonresearch.net/resources/content-resources/>); courses to support lesson study(<https://lessonresearch.net/resources/courses/>); video and resources on mathematics

teaching through problem-solving (<https://lessonresearch.net/teaching-problem-solving/overview/>).

From 2001-present: Development and dissemination of many videos of elementary mathematics and science lesson study in the U.S. (www.lessonresearch.net) and Japan (<https://lessonresearch.net/resources/content-resources/>), including school-wide lesson study (<https://lessonresearch.net/resources/schoolwide-lesson-study/overview/>). From 2010-present she has been President (2020-) and Vice-president (2014-2019) of World Association of Lesson Study (<https://www.walsnet.org/>). She is currently a member of the Editorial Boards of *International Journal of Lesson and Learning Studies*; *Journal of Teacher Education*, *Review of Educational Research*.



Lewis: The 2022 annual conference of the World Association of Lesson Studies ("WALS") (<https://www.walsnet.org/>) in Malaysia. The meetings are held in a different location every year, attracting 400-1200 Lesson Study practitioners and researchers from more than 30 countries. Catherine Lewis currently serves as WALS President.

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