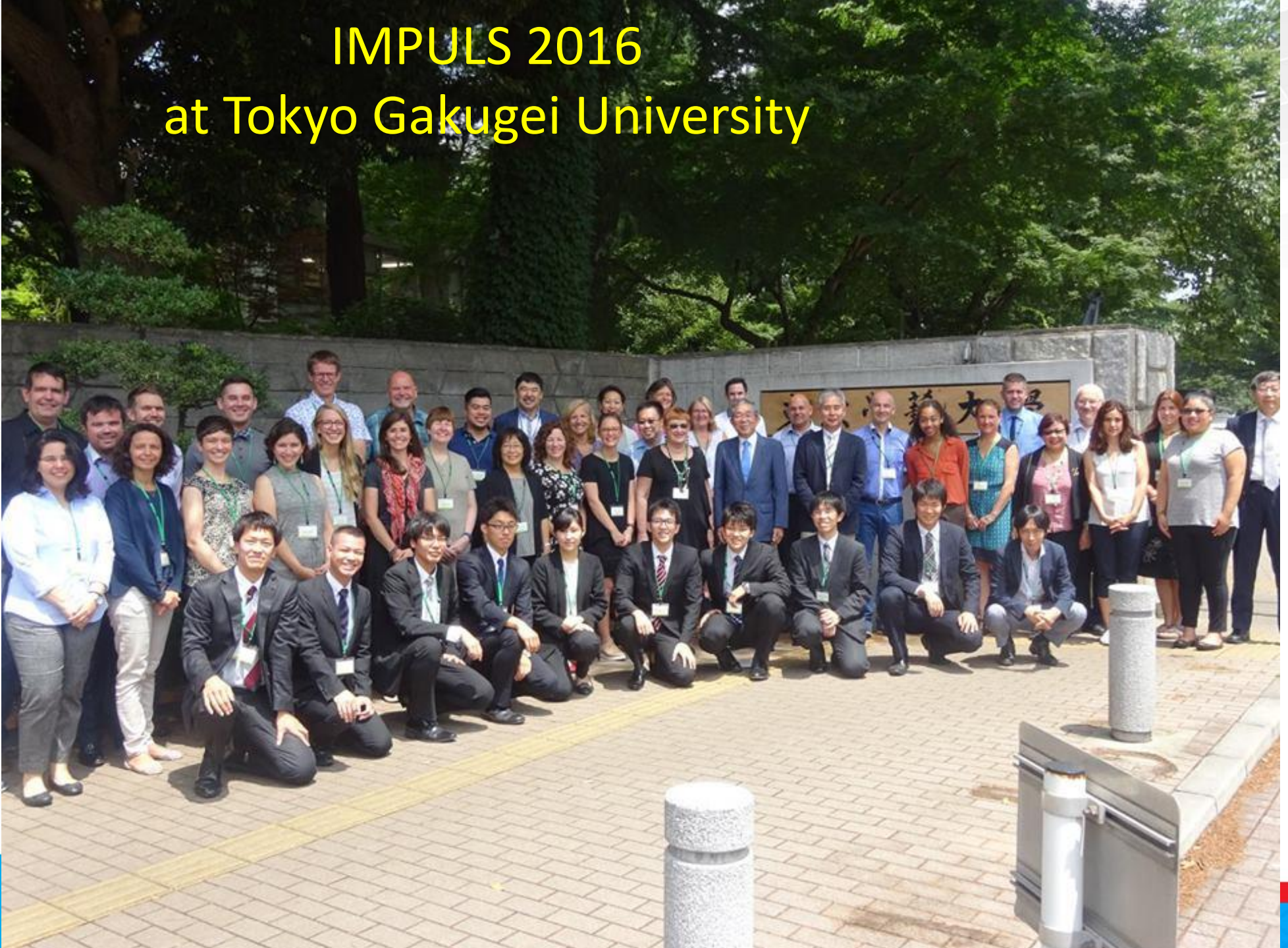
REVISITING LESSON STUDY

Teh Kim Hong
Training Programme Division
tehkh@recsam.edu.my



Appreciations:

With fond memories of the late Prof Dr Lim Chap Sum whom I picked up LS , learn along with her, and led me here;

My appreciations to Assoc. Prof Susie Groves (University of Deakin), a member of support committee in overseas of the project IMPULS, recommended me to the programme;

Thank you to the the Ministry of Education, Culture, Sports, Science & Technology of Japan & the Mathematics Education Department of Tokyo Gakugei University, Tokyo, Japan., particularly the project director Professor Toshiakira FUJII.

A sharing session of the IMPULS Immersion Program

- A glimpse of lesson study in Japan
- Observations in a few schools visited
- Lesson study for professional development
- Essential elements of lesson study
- My learnings

What is IMPULS ?

- International Math-teacher Professionalization Using Lesson Study
- Funded by the Ministry of Education, Culture, Sports, Science & Technology of Japan.
- 5 years project (started in 2011)
- Hosted in the Mathematics Education Department of Tokyo Gakugei University (TGU), Japan

Roles

- Tokyo Gakugei University (TGU)and its network of laboratory schools
  - serve as an international center of Lesson Study in mathematics
  - help teacher professionals from different regions to learn about lesson study
  - prepare teacher professionals to create a long-term learning system in their own countries for independent educational improvement in **mathematics teaching**

- A unique feature of Japanese Lesson Study:
  - it enables teachers to improve their practices continuously through collaboration with their colleagues

Lesson Study(Jugyou-kenkyu)

33 Participants of IMPULS 2016:

USA - 12
UK - 11
Switzeland – 1
Portugal – 2

Australia – 3
Natherland - 2
Singapore - 1
Malaysia - 1

Who were in IMPULS 2016 ?

Professor Toshiakira Fujii
Department of Mathematics Education,
Tokyo Gakugei University

Professor Akihiko Takahashi
DePaul University, Chicago, U.S.A
Lesson Study Alliance

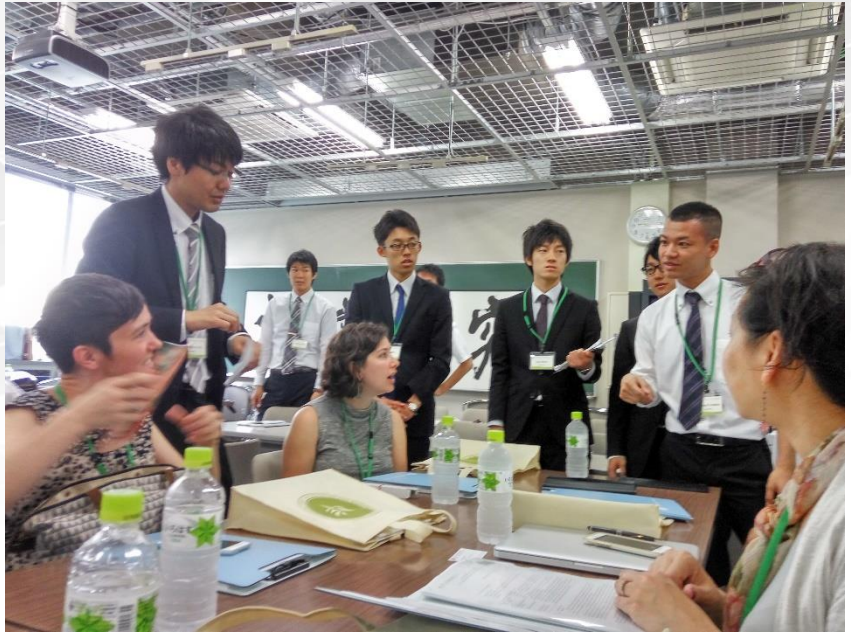
Tad Watanabe
Professor of Mathematics Education
Kennesaw State University

Christine Kim-Eng Lee
External Evaluator
NIE Singapore
Chairman of WALS

Welcoming sessions

- Mathematics

  Department, TGU



My experiences in school visits

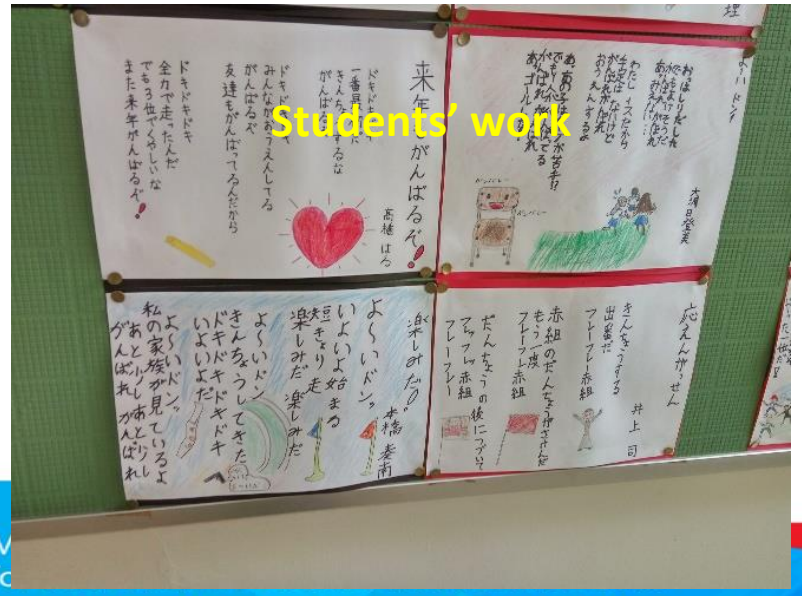
- Visited 5 schools (by public transport: bus/train and coach to Yamanashi)

Research Lesson Attended	Name of school	Type/Topic
1	Sugekari Elementry School	School based LS (Grade 6) Area of curved figures
2	Saiwai Elementary School	School based LS (Grade 4) Ways to calculate 48÷3
3	TGU attached International School	Grade 7 Slope of graphs
4	TGU attached International School	Grade 9 Sample survey
5	Ryuo Elementary School	School-based LS (Grade 5) Volume of complex figures
6	University of Yamanashi Attached Elementary School	Cross-district LS (Grade 1)
7	University of Yamanashi Attached Elementary School	Cross-district LS (Grade 6)

Some observations in the schools visited

Cleaniness the priority

Appreciation/recognition of students' work

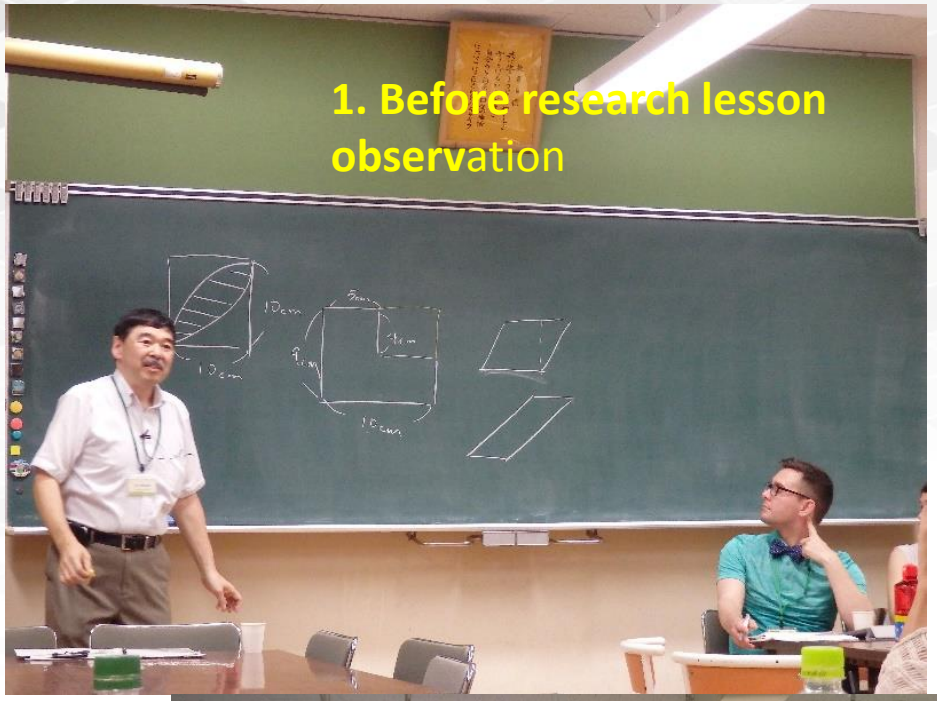


Staff room

- Arrange in cluster
- Linked
- Easy collaboration
- Sharing of academic knowledge & professional practices

Meal time in a school

Daily Learning Experiences



5. Daily reflections & review of research lesson for the next day

What is Lesson study ?

- Lesson Study in Japan began in the late 19th century
- An approach to instructional improvement and professional development
- a form of classroom inquiry
  - several teachers collaboratively plan & research, teach, observe, revise and share the results of a single class lesson
  - study their lesson instructions as a way to determine how students best.

Lesson study in Japan

- *The Teaching Gap* (Stigler & Hiebert, 1999):
  "Japan's approach to improvement of classroom teaching" which is based on Yoshida (1999) provoked enormous interest in lesson study as a process for professional development among non-Japanese educators and researchers

Lesson Study in Japan

- Stigler and Hiebert argued that Japanese mathematic lessons better exemplify current U.S. reform ideas than do typical U.S. mathematics lessons (1999).

"When we watched a Japanese Lesson, for example, we noticed that the teacher present a problem to the students without first demonstrating how to solve the problem. We realized that U.S. teachers almost never do this. U.S.teacher almost always demonstrates a procedure for solving problems before assigned them to students. "

- Lesson Study was Introduced as a form of professional development to improve mathematiccs teaching and learning .

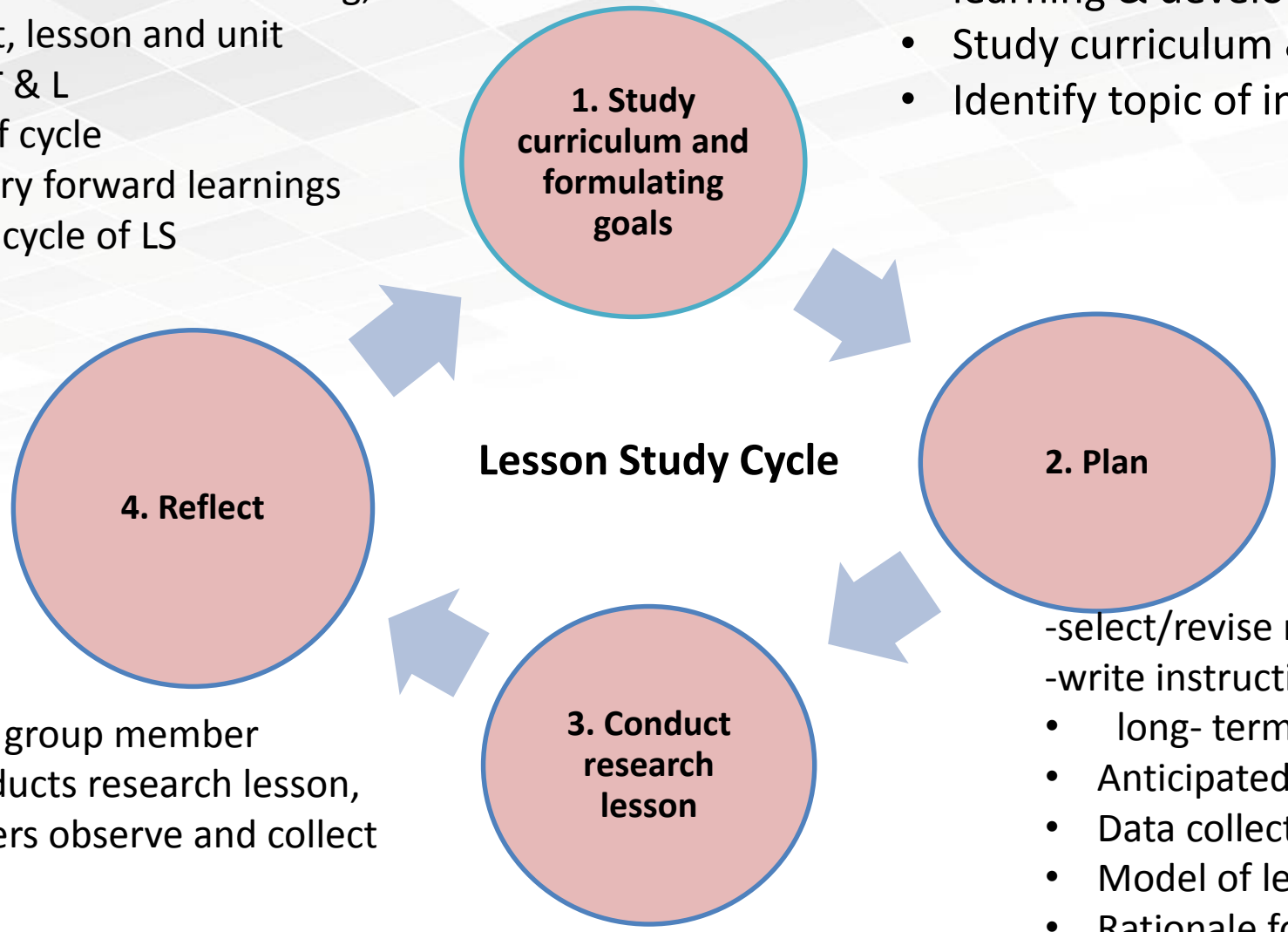
Steps in the Lesson Study Process (Stigler & Hiebert, 1999)

1. Defining the problem
2. Planning the lesson
3. Teaching the lesson
4. Evaluating the lesson and reflecting on its effect
5. Revising the lesson
6. Teaching the revised lesson
7. Evaluating and reflecting again
8. Sharing the results

Formal lesson colloquium

- Share data from lesson
- Use data to illuminate student learning, displinary content, lesson and unit design, issues in T & L
- Documentation of cycle
- Consolidate & carry forward learnings
- New Qs into nect cycle of LS

- Long term goal for student learning & development
- Study curriculum & standards
- Identify topic of interest



-select/revise research lesson
-write instruction plan

- long- term goals
- Anticipated student thinking
- Data collection plan
- Model of learning trajectory
- Rationale for chosen approach

- One group member conducts research lesson,
- Others observe and collect data

(Lewis & Hurd, 2011)

Variations in Lesson study

- There are variations developed in the Japanese Lesson study program (Stigler & Hiebert, 1999).

- Variety of adaptations

- Japanese researcher Baba(2007) described a number of variations as in school training, Lesson Study conducted by teachers on voluntary basis… hosted by academic societies”

Interest and experimented with introduction of LS

- The United States,
- The Asia-Pasific Economic Cooperation (APEC) countries –

  (eg. Australia; Brunei Darussalam; Canada; Chile; China; Hong Kong, China; Indonesia; Japan; Malaysia; Mexico; New Zealand; Papua New Guinea; Peru; The Philippines; Russia; Singapore; Republic of Korea; Chinese Taipei; Thailand; and Viet Nam).

- African Nations since 2008 (Uganda, Malawi, kenya, Ghana,uganda, Nigeria-funded by JICA)
- Books and research papers have been written (Groves & Doig, 2010; Lewis, Perry, & Hurd, 2009; Takahasi, 2006; Watanabe, Takahashi & Yoshida, 2008)
- Lesson Study - first introduced to **Malaysian mathematics teachers in 2003** as small scale research projects and postgraduate student dissertations (Lim, Teh & Chiew, 2016)

Early attempts of Lesson Study

- Based on research reports
- BUT rarely the researchers or educators had observed lesson study in Japan or have prior experiences of doing lesson study themselves.
- Methods: follow prescriptions of lesson study
- Adapted the process to fit the limited time most schools offered.
- Duplicate the success of LS in Japan at transforming teacher centre to student centred instruction that focus on mathematical thinking and Problem solving

  (e.g. Hart et.al.2011)

Examples of poor LS practices

Reported by Takahashi:

- In a school district , the entire lesson study cycle is done within a day
  - Morning: a team of teachers plan a lesson for 30 minutes
  - Teaching: to students
  - Observed & reporting
  - Afternoon: modified the lesson plan in 30 minutes
  - Then taught the revised lesson
  - All process of LS are done. Documentation done.

  (Takahashi & McDougal, 2016)

- In Japan, one typicl elementary school LS cycles is more than 5 weeks

  (Murata & Takahashi, 2002)

LS is never done in a day!

Another example:
Misunderstanding of the purpose of lesson study

A situation:

- After a public research lesson and post-lesson study,

  the teachers involved commented that they had not learned much from the process.

WHY?

- already done LS 6 times on that same lesson.
- **thought** LS is to create a perfect lesson plan

- **The true purpose of LS is to gain new knowledge for teaching and learning, not to perfect a lesson.**

- **Re-teaching a research lesson even once is not a common practice in Japan**

(Fujii, 2014)

Concerns of Lesson Study Outside Japan

- Effectiveness – unclear

- Not well documented except Lesson Study Group in Mills College(Lewis et al. 2006)

- Fujii (2014) observed LS in African countries – many aspect of LS as practiced in Japan are left out.

- In US. – Help teachers gain knowledge and insight into mathematics and student thinking
  - many projects omit the first crusial phase of LS, kyouzai kenkyuu. (Takahashi et al. 2005, Lewis et al. 2011)

Jugyou kenkyuu	**Lesson study**
Primary form of professional development in Japan for over a hundred years	-Introduced outside of Japan in the late 1990 -**translated as 'lesson study'** (Stigler & Hiebert, 1999; Yoshida 1999)
	Research articles - described what Japanese teachers do to improve teaching and learning (e.g. Lewis and Tsuchida 1998; Yoshida 1999; Stigler & Hiebert, 1999;)
	- report lack explaination about why Japanese teachers do LS, - which part of the process are essential and - which parts can be modified.

Effort through IMPULS

- Bringing teacher professionals/educators to Japan, experiencing Japanese lesson study
- Experiencing the teaching culture of Japanese teachers
  - through school visits
  - observe research lesson
  - learning about the preparing a research lesson
  - making LS observation report
  - Reflections
  - diseminate the ideas of LS in respective country's professional development system for improvement of teaching and learning of mathematics

Some questions raised and the new learning

- What does a lesson plan look like for non-research lesson?
  Are Japanese teachers required to submit lesson plans for administrator approval?
  - Japanese teachers do not write the extensive lesson plan they prepare for research lesson.
    A typical lesson plan may be 1-page or shorter.

  - Some teachers may use board plan as their daily lesson plan/sketch.

  - There are commercial books that shows board writing plans for every lesson for a series of textbook.

Clarifying questions on Lesson Study

- The focus in lesson study is improving teaching, not necessarily teachers.
- Good teachers are not born, but by gaining expertise throughout their careers.
  If you don't work hard to improve, you will not be a good teacher.
- Teacher certification allows you to be a teacher. You have to work hard to be a good teacher.
- "Teaching" is not about a teacher's personality.
  Teaching depends on the quality of one's research, etc.

- In lesson study, do teachers teach the same research lesson for multiple times?
  - Re-teaching is not a regular component of lesson study in Japan.
  - Some teachers may “pilot” a task/lesson prior to the research lesson. It is done after the team is basically done with lesson designing.
  - The purpose of piloting is to fine-tune the lesson, but they are not using that opportunity to identify loop-holes in a lesson or to make major revisions.
  - Japanese teachers do not want to treat students as “guinea pigs” for their lessons.
  - If teachers have different perspectives on teaching a particular topic, they may teach a lesson using their own perspectives and report the results back to the planning team.
  - The goal of lesson study is not to develop a perfect lesson – revision does not necessarily improve a lesson – we are working with different group of students with different mathematical experiences.

What other forms of professional development in Japan?

- LS is the major form.
- There are workshops/lectures offered by various organizations.
- LS is built into teachers' schedule (in elementary and lower secondary). There is typically a half-day every month so that the afternoon may be used for LS.

Has the way post-lesson study is organized changed over the years?

- Catherine Lewis' LS handbook (2002) was designed for teachers who have never practiced lesson study – an entry point.
- As teachers gain more experiences, the way post-lesson discussion is organized may change.
- **There is no single protocol for post-lesson discussion in Japan.**

  There is no single protocol for observing lesson either.

- Can LS be done in other subjects? Why not.

  Can there be LS that does not involve actual teaching with students? (???)

  - Mock-up lessons are used in planning research lessons. It may be done with the team, or by the teacher alone (if experienced).

What opportunities for teacher learning does lesson study afford?

- Values are shared and communicated.
  - "Mission" statements of schools may be a useful starting point to develop a research theme.
- Continuity of learning. Understanding the flow of learning across grades.
  - LS involves one research lesson – but this continuity must be considered to develop a lesson.
- Focus on content.
- Focus on development of teachers as professionals (community of professionals).
- Teachers supporting each other's growth.

- Opportunities for teachers to make professional contribution.
- Opportunities to gain insight into students' thinking.
- Opportunities to bridge the gap between teachers and researchers.
  - De-centralizing professional learning of teachers.
- Opportunities to see lessons more "objectively."
- Shared experiences to examine teaching.

How did your view of lesson study change from your participation in IMPULS?

- Powerful way of having teachers involved in CPD of schools.
- The power of knowledgeable others – not just summarizing, having a plan for teacher learning.
- Focusing on student learning vs. focus on teaching – post-lesson discussion should go beyond simply reporting what students did but thinking about the reasons for those actions during teaching.
- Amazing way of board work
- Study of curriculum materials – kyozai kenkyuu is very important

- Focus on students' explaining – being able to communicate their reasoning, understanding friends' ideas and explaining, etc.
- Importance of LS as the communal experience.
- Shared responsibilities by all people at the school
- Whole class discussion – show-and-tell vs. source of learning.
- Incorporating students' voices in their learning.

How do you view teaching and learning now?

- Reaffirm my understanding and teaching through problem solving is an approach to take
- Many of the local daily practices have been too superficial and perhaps does not support student learning as much as it should be.
- Creating excitement/motivation for learning.
- Focus on educating children holistically and school as a happy place.
- Nurturing children's thinking through mathematics teaching.
- Teaching primary mathematics is not easy . Laying the correct mathematical concepts in elementary math is important.
- Relationship between process/practice and content.
- Traditional means and tools are still relevant and excellent in T and L of math. Conceptual understanding through thought processes take the students far in their learning.

- Importance of productive struggle – teachers must support students to experience successes.
- Teachers and students having shared norms.
- Students know when they can play and when they are in the time for learning.
- Possible to allow students to explore math themselves in pairs with thought provoking tasks and questions
- Mathematical thinking and skills acquire through a lesson is more valuable than rote practices.
- Provide communication opportunities for students to explain their thoughts and understand others
- The importance of developing mathematical thinking
- Teaching through problem solving encompasses the 4Cs
- "May our children continue to enjoy math." (Mr. Hase – former principal of Sugekari ES)
  - We should continue to nurture students' excitement for learning.

How will you take this back to your own context?

Very challenging questions ! A lot to think about!

- How do we take back a complex idea with multiple features and put them into a new setting?
- What might be a good entry point in your own setting – in light of your observation of an authentic practice?
- How do we get school leadership on board – whole school PD system, going beyond an activity by a sub-group.
- Need systematic changes, yet that may require some “proof” of its effectiveness.
- How do we convey our learning observing Japanese teachers engaged in LS first-hand to our colleagues who did not have the same opportunity?
- How do we help them see the usefulness of LS in improving their practices.
- How to communicate with our colleagues – meeting where they are, instead of 10 steps ahead? Invite them to observe a research lesson, perhaps.

How far have I accomplished?

- A very big challenge:
- Not easy to convince others who already have some forms of LS experiences on alternative perspectives.
- What has been done and will still be doing?
- Invited Prof Takahashi to conduct a workshop on teaching mathematics through problem solving, a common approach practice by Japanese math teachers
- Conducted LS workshops for course participants
- Practice the approach of teaching math through problem solving to all mathematics participants whenever opportunities are available, and through workshops
- Invite school teachers to participate in research lesson
- Rekindle the interest and raise awareness on the importance of lesson study among teachers and school leaders

Thank you to all the mentors

Prof Fujii & Assoc. Prof Susie Groves

Assoc. Prof Christine Lee & Prof Takahashi

Assoc. Prof Christine Lee & Prof Watanabe

Acknowledgement

Learn more at:

- Fujii, T. (2014). Implementing Japanese Lesson Study in Foreign Countries: Misconceptions Revealed. Mathematics Teacher Education and Development 2014, Vol. 16.1, 65–83.
- Fujii, T. (2016). Designing and Adapting Tasks in Lesson Planning: A Critical Process of Lesson Study. *ZDM Mathematics Education . DOI 10.1007/s11858-016-0770-3*
- http://www.lessonstudygroup.net and http://www.lsalliance.org
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- Lewis, C.(2002). Lesson Study: A handbook of teacher-led instructional change.
- Stigler, J.W., & Hiebert, J. (1999). *The Teaching Gap: Best Ideas from the World's Teachers for Improving Education in the Classroom*. New York: The Free Press.
- Takahashi, A. & Watanabe, T. (2014). Kyozaikenyuu: A key to conduct lesson study effectively: FCR STEM Conference 2014. http://science.kennesaw.edu/~twatanab/
- Takahashi, A. & McDougal, T. (2016). Collaborative lesson research: maximizing the impact of lesson study. ZDM Mathematics Education (2016) 48:513–526.

Thank you

These slides are part of the colloquium conducted on lesson study that were shared among teachers and educators.