



HotTOPIC

Lesson Study: The Facts Behind It

“There is an African proverb that says, ‘When an elder dies, a library burns down.’ The same is true of teaching,” says American educator and researcher Catherine Lewis. She was referring to how teachers are not able to benefit from the knowledge accumulated by experienced teachers.

One solution is the practice of lesson study. “Lesson study is a way of allowing teachers to share their knowledge,” she explains. “It is a systematic way of building teachers’ knowledge together, and has shown impact on both teachers’ and students’ learning.”

The Practice of Lesson Study

The concept of lesson study is quite simple. Teachers work in teams to collaboratively plan a lesson unit. They then observe the research lesson together and reflect on how it can be improved.

“It’s really building a professional knowledge base for teaching that doesn’t just reside in documents but in teachers meeting together, carefully looking at a shared example, and then trying that in your own classroom,” explains Catherine.

The focus in all of these processes is on how students learn. “You’re really looking at student learning and saying: Is this working for students? And if it’s not working, how do we as teachers need to change it to make it work?”

“Over time, when teachers work in lesson study, they go from saying ‘my students’ to saying ‘our students’,” notes Catherine. “They come to realize that what they do as an individual teacher is not nearly as powerful as what the whole school does.”

The Purpose of Lesson Study

Lesson study presents a very practical approach to designing better lessons. In Japan, where lesson study originated, it is seen as a powerful means of enhancing teacher capacity and heightening teachers’ sensitivity to how their students are learning.



Lesson study
develops the eyes
to see children.

- Catherine Lewis,
Mills College, California

Special thanks to NIE’s Curriculum, Teaching and Learning (CTL) Academic Group for making this issue possible. Thanks is due especially to Christine Lee for her support and John Yeo for his tremendous effort in co-ordinating and editing the articles.

Lesson Study in Singapore

- >> How does lesson study help to improve student learning?
- >> Will listening to students help with their Science learning?
- >> How can we know about students’ misconceptions in Math?
- >> Can lesson study build a language learning community?
- >> What can we learn from a Japanese lesson study veteran?

All these and more at <http://singteach.nie.edu.sg>



An Institute of



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Lesson study is a wonderful way of getting teachers to rethink their classroom practices.

- Christine Lee on the value of lesson study

“Japanese teachers often say, lesson study develops the eyes to see children,” says Catherine. “When you’re doing lesson study, and you’re an observing teacher, you’re an extra pair of eyes and an extra pair of ears, but not an extra mouth, not an extra pair of hands.”

It has also become a useful means of informing policy-making. “In Japan, policymakers realize that even the most carefully crafted policies are just blots of ink on paper until teachers bring them to life in a classroom,” shares Catherine. “It’s that bringing to life in the classroom that becomes the centre of learning.”

Thus, when the Japanese want to introduce a new topic into the curriculum, interested schools volunteer to be “research schools” to experiment with various ways of teaching the topic, for which they receive a small research stipend. At the end of a year, many of them conduct public research lessons to share what they have learned with teachers from other schools.

The Protocols of Lesson Study

To ensure that the focus is on student learning, and not an evaluation of the teacher, the practice of lesson study is guided by careful protocols. There are at least two key protocols.

The first is the *observation* protocol. “You need to carefully observe what the students are doing and saying, not just whether they are giving the right answers,” Catherine reminds us. “You’re not there to help the students or to teach them; you’re there to take careful notes on their learning. By carefully sitting and watching, you’re really listening to the children. You can’t learn from children unless you’re quiet yourself.”

There is also the *discussion* protocol. In the post-research lesson discussions, the teacher who taught the lesson speaks first. “The unspoken understanding is that if something was a problem, they get to be the first one to identify it. The conversation focuses on the students, not on the teacher or the teaching.”

Comments from the other team members are likewise focused on what the students were doing and how they responded. “It’s careful, principled description of students, not leaping into inferences or into evaluation. They don’t say, ‘I liked this’, or ‘I liked that’. They say, ‘I was watching this student and this student used this method’, or ‘This was where they encountered a barrier’.”

When put together, these descriptions help us to get a picture of how the lesson was for different students. We can then begin to naturally draw the implications.

A Platform for Professional Development

“Lesson study is a wonderful way of getting teachers to rethink their classroom practices,” says Associate Professor Christine Lee, Head of NIE’s Curriculum, Teaching and Learning (CTL) Academic Group, which pioneered lesson study in Singapore schools. She is also the President of the World Association of Lesson Studies (WALS).

Christine has found lesson study to be a powerful platform for teacher professional development. As a form of teacher research, lesson study allows teachers to inquire into their own practice, especially topics that are problematic to teach.

“Lesson study is not about getting good lesson plans; it’s about

changing teachers’ classroom practices,” she says.

The team had added an innovation to the practice of lesson study in Singapore: Observing teachers are given a few minutes to interview students immediately after the research lesson.

“Sometimes you think the kids are doing something, but unless you ask them, you do not know what they think. So after a research lesson, we always encourage the observers to talk to the children, to ask them questions about the task they have done, to get into their thinking,” explains Christine.

For schools that are interested in using lesson study, Christine recommends at least an

introductory workshop before they start, to make sure they have a proper understanding of what it’s about.

“Lesson study is not an add-on. It can be used as a platform to help teachers make sense of what they already have in the school.”

CTL offers a series of professional development workshops for Singapore schools. Details are available at: <http://www.nie.edu.sg/academic-groups/curriculum-teaching-and-learning/professional-development>

The WALS International Conference 2011, 26–28 Nov, is hosted by the University of Tokyo, Japan. More details can be found at: <http://www.wals2011.com>

The Possibilities of Lesson Study

Catherine says implementing lesson study requires “a big culture change”. It requires that teachers investigate their own practice, to find out what works best in their classroom, rather than just implementing policy.

It also requires openness and mutual trust as classrooms become less private. More importantly, “You need a sense that however many years I’ve been teaching, I can still learn; and a sense that the children need to be our teachers.”

As teachers work together in lesson study— as they enter into “research mode”—they develop a shared vision of teaching the best lessons. Lesson study helps teachers to grow by understanding how students learn.

“It should help teachers rediscover the joy of learning.”

Catherine Lewis is a Distinguished Research Fellow at Mills College, California. Her latest book is entitled *Lesson Study Step by Step: How Teacher Learning Communities Improve Instruction* (2011). Find out more about lesson study practice at: <http://www.lessonresearch.net>

ScienceED

Let Students Tell Us How They Learn

by Yoong Jin Ing

When a team of Physics teachers at Siglap Secondary School wanted to help their students understand the concept of “friction” better, they turned to lesson study. They started by trying to understand how their students learned.

To better understand how Secondary 3 students learn the concept of “friction”, our professional learning community team decided to embark on lesson study.

Apart from the usual qualitative data derived from students’ work, observers’ notes and classroom discourse during the lesson, we added something else: teacher observers had 10 minutes to interact with the students at the end of the lesson.

Surfacing Students’ Voices

Students’ own explanations of what they were doing can give us a better understanding of what learning means to them and how they go about it. This provides us with rich perspectives for evaluating the lesson and instructional approaches.

We paid careful attention to the students’ voices, that is, student conversations during the lesson, student–observer dialogue after the lesson, and students’ work and reflections on their work.

In lesson study terminology, these student voices enable teachers to see instruction through the eyes of the students (Lewis, Takahashi, Murata, & King, 2003). We can then make improvements in the learning activities and environment to enhance students’ learning experiences.

Studying the Phenomenon of Learning

A phenomenographic approach was used as the framework for this study. This involves looking at a particular phenomenon—in this case, the learning experienced by the students—and seeking “an empathetic understanding of what is involved in student learning derived from students’ descriptions of what learning means to them” (Marton, Hounsell, & Entwistle, 1984, p. 13).

We looked at three aspects of student learning:

- The conceptions of learning we think students have and use form the **theoretical basis** upon which teachers plan their lesson: *What and how to teach.*
- What students conceive of as learning influences what they do during the lesson. Taken together, the observations made during the lesson, interactions at the end of the lesson and students’ work make up the **analytical aspect** of the study: *What students actually learned.*
- Our reflections and evaluations at the post-lesson colloquium session provided the **pedagogical dimension** for revising the lesson to improve learning outcomes: *How to better advance or progress student learning.*

Article highlights

- How can teachers surface students’ voices?
- Why should we pay attention to students’ voices?
- How can this help to deepen student learning?



Student voices enable teachers to see instruction through the eyes of the students.

- Yoong Jin Ing,
Siglap Secondary School

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Resources

Check Siglap Secondary School’s website: <http://www.siglapsec.moe.edu.sg/index.php/department/science-mainmenu-55>

About the author Mrs Yoong Jin Ing is Vice Principal of Siglap Secondary School. Mrs Yoong and the team would like to thank: Fong Lay Lean (NIE) and Charles Chew (Academy of Singapore Teachers) for their valuable inputs in the planning of the research lesson; Christine Lee and Catherine Lewis for their insights as commentators; and their students for their participation in this study.

Using Marton’s *conceptions of learning* as a basis (Marton, Dall’Alba, & Beaty, 1993), observers probed for levels of processing—for evidence of “deep and surface approaches to learning” (Marton & Saljo, 1976).

Planning the Research Lesson

At the planning stage, as we thought through the probable misconceptions students might have, we realized that these were based on our own experience of learning or teaching the topic. We needed to unpack *students’* prior knowledge and understand why they write or say something.

This led us to incorporate a *Predict-Observe-Explain* (POE) cycle into the lesson. The use of experiential trigger activities and investigative learning tasks in the POE cycle provided opportunities to anticipate the difficulties students might face and hence scaffold the inquiry process.

During the lesson, observers noted that the POE cycle encouraged students to vocalize their thinking by asking questions or clarifying. Students were guided to explore and correct their prior knowledge and move into deeper levels of processing.

It also helped students to overcome their fear of saying something wrong or making mistakes. This allowed the teacher to work on students’ misconceptions, instead of simply dismissing incorrect answers as “wrong”.

Engaging in Deeper Learning

We found that different learning outcomes are achieved when students are engaged at different levels of processing.

A key outcome of this study was the change in students’ conceptions of learning, from surface level to deeper learning. When teachers provided opportunities for students to make sense of what they were learning, they tended to engage in deeper levels of processing and attain deeper understanding.

Clearly, the way teachers teach and facilitate student learning affects not just what students learn but also the quality of that learning.

Uncovering Conceptions of Learning

The way students make sense of what they are learning plays a big part in their ability to succeed as students, and as teachers, we hold the key to making that happen. As teachers, we need to:

- bring about changes in both our students’ and our own conceptions of learning;
- explore and embrace instructional approaches that build on students’ existing conceptions to bring them to higher levels of understanding; and
- understand what other factors contribute to the quality of students’ understanding.

Lesson study holds tremendous potential in uncovering both students’ and teachers’ conceptions of and approaches to learning. By understanding how students experience learning, teachers can develop more effective ways to enhance their learning experience.

The question we need to ask ourselves is: To what extent are we, as teachers, willing to allow student voices to help us rethink our teaching practices?

MathED

Understanding Students’ Misconceptions in Learning

by Choy Chan Hong, Irving Quah, Tan Wen Dee and Toh Pui Yhing

If we want our students to learn from us, we may have to start learning from them. Through the lesson study process, our focus shifts from how we teach to how they learn, and a culture of observation and discussion is created.

Do our students really understand what they have learned? Are they able to transfer the knowledge and apply it to new situations? What difficulties do students face and how can we help them?

Article highlights

- How can we find out how learning is taking place in the minds of students?
- How can we plan the lesson to ensure our students learn better?
- How can we promote lesson study as a tool for professional learning?

As teachers, we need to be aware of our students' learning behaviours. If they are not able to apply their learning correctly, it could be due to misconceptions (Carpenter & Lehrer, 1999). This awareness can help us adapt our teaching strategies to better impact our students' learning.

“Seeing” Our Students Learn

In 2008, the Math Department at Clementi Town Secondary School adopted lesson study in our professional learning teams. Lesson study has taught us to understand our students' misconceptions, the reasons behind these misconceptions, their physical and verbal responses during lessons, the quality of their work, their attitudes as well as how they interacted with their classmates.

In our research lessons, we usually start off with a recapitulation activity to draw out any misconceptions of basic concepts. We address these before introducing new ones.

For example, in one of the research lessons, we used a cuboid tank and planes made from acrylic as a trigger activity to help the students visualize a trigonometry problem. Through the lesson observation and post-lesson discussions, we received immediate and valuable feedback that helped us to understand the students' misconceptions and learning behaviours.

Based on this feedback, we revised our worksheet to provide clearer instructions for future lessons. The teacher who taught the lesson also made a conscious effort to guide the students through the activity by using probing questions.

Guiding Our Students' Learning

From our ongoing journey in lesson study, we have gained some important insights on preparing effective lessons. We have found that it is important to:

- delineate the lesson objectives explicitly so that the students know what they are going to learn;
- plan the lesson with proper scaffolding from one section to another to optimize time and the learning process;
- consider the dynamics of the class so that you can group the students effectively for collaborative learning; and
- ensure instructions are clear and, if needed, model the lesson activities for students.

We also found that we need to enhance our students' inquiry skills (the type and frequency of questions asked) to promote deep thinking. This would help students make sense of their learning and connect their learning to pre-existing knowledge (Piaget, 1964, 1969).

Guided by the learning points we had gleaned through lesson study, we have been able to enhance our teaching practices to improve students' understanding of the lessons and achieve the lesson goals.

Strengthening Teacher Learning

Over the years, strong collegial bonds have been forged between the teachers. Through the lesson study process, we have begun to establish a classroom culture of observing our students closely in order to improve student learning.

Having benefited from the process of lesson study, we wanted to share our experience with fellow educators and allow them to have a first-hand experience of observing a public research lesson. We successfully implemented the first public research lesson in March 2011 with a Secondary 5 Normal (Academic) Math class.

The public lesson was attended by more than 50 participants, including school leaders and teachers from other schools. They had the opportunity to analyse the students' behaviours in an authentic, real-time classroom setting, and discuss ways to further improve the instructional plan through an evidence-based and structured approach.

The post-lesson conferences are especially useful in sharpening our classroom instruction collectively in a non-intrusive manner. For this event, we had two eminent Japanese educators present, who provided rich insights for all participants.

We hope more fellow educators can learn about lesson study through experiencing it themselves.



As teachers, we need to be aware of our students' learning behaviours.... This awareness can help us adapt our teaching strategies to better impact our students' learning.

- Math teachers,
Clementi Town Secondary School

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About the authors Choy Chan Hong, Irving Quah, Tan Wen Dee and Toh Pui Yhing are teaching staff of Clementi Town Secondary School.

Article highlights

- What types of topics lend themselves to lesson study?
- How can lesson study be incorporated into the existing curriculum?
- What is the value of iterative cycles of lesson study?



It is about incorporating what is most appropriate for student learning at strategic moments.

- Lydia Tan-Chia,
Ministry of Education

Resources

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Reflecting on the English Language Classroom through Lesson Study

by Lydia Tan-Chia

Who says English lessons need to be predictable? English teachers in seven project schools are beginning to realize lesson study's flexibility as they work together to think through the design and delivery of English lessons.

Project En-ELT is an exploratory study by MOE's English Language and Literature Branch, under the Curriculum Planning and Development Division, to support teachers in the learning and teaching of English Language in secondary schools.

Working closely with their School Advisers, the teachers gather in learning communities to analyse and rework research lessons. They have been studying the use of three research-based teaching strategies—*Retelling*, *Process Writing* and *Reciprocal Teaching*—and rich texts to connect teaching to learning in the classroom.

These teaching strategies encapsulate the pedagogical content knowledge for the teachers. As students work on the product and processes of the various tasks, they not only strengthen their skills in all areas of language learning. For onlookers, this process makes learning visible in the classroom.

Melding this with Assessment for Learning (AfL) principles into daily classroom practice, the aim of this project is to facilitate the development of reading and writing skills, as well as speaking, critical listening, critical-inventive thinking and metacognition in students.

Planning the Research Lesson

The roles within each team are defined yet flexible, but subject matter leadership is assumed by the Head of Department, Level Head or Instructional Leader in the group. The research lesson usually takes off from a prototype first put together by the group leader or a key teacher in the group.

The research lesson is situated in a unit of work but is selected for its potential to exemplify key steps of the teaching strategy. Teachers work with one key strategy per semester in one lesson study cycle. The duration of the lesson study cycle, of approximately a week or slightly more, is adapted to coincide with the unit of work as defined in the scheme of work.

The agenda during instructional planning is curriculum driven. It is guided largely by the intention to enact the teaching strategy and to master its basic steps, on one hand, and the desire to incorporate AfL practices (e.g., Socratic questioning), structure consolidation and gather feedback, on the other.

The corrections and suggestions from the group discussion are usually taken on board. It is about incorporating what is most appropriate for student learning at strategic moments. The central documents used are two highly portable resources: an instructional planning tool and a piece of rich text.

Observing the Research Lesson

A teacher volunteers to deliver Research Lesson One (RL1). It is recommended that the more experienced teacher lead the way, though it does not always happen. Then comes the moment of discovery, a moment that has been aptly captured by Takahashi when he noted: "Good teaching is very easy to talk about, but very hard to do" (in Lewis & Hurd, 2011, p. 77).

The lesson observation allows teachers to see how theoretical constructs transition from planning to enactment in a live classroom. Their proximity to the students allows them to notice the effect of the lesson on student learning. That remains the heart of lesson study: student learning and student work.

Then, armed with evidence of student learning, the post-lesson colloquium allows the teachers to turn the teaching strategy inside out. The colloquia occur within the same day of the observation. The immediacy of the classroom experience lends vigour to the analysis of the lesson.

Guided by the protocol recommended by Catherine Lewis, the group analyses each segment of the lesson. Their findings are substantiated with evidence of student learning and the AfL moments seized by the RL teacher. The RL teacher might also bring artefacts from students' class work, which becomes another source of evidence and discovery.

At the end of the exchange, the Instructional Leader will sum up the key learning points. These are quickly spun into propositions for future practice. The colloquia end with agreement on the areas for improvement, which will be worked into a replay of the lesson at Research Lesson Two (RL2) by another teacher in the group.

Refining Learning through Study Cycles

If the lesson study cycle stops at RL1, the proposed refinements to the curriculum will remain as theoretical constructs.

With RL2, the focus is on testing out the efficacy of the improved curriculum features and teaching strategies on the students. Observing the enactment of RL2 offers a contrastive perspective of the teaching strategy, with its alternatives and possibilities, which in turn animates the teachers' collaborative learning.

Teachers come to realize that so much can happen by just being in one another's classrooms and studying one another's students. Improvements are carried out while they are still meaningful, and the juxtaposition of good practices can also sway the doubting Thomas in the group.

As for MOE, more discoveries await as we continue to closely study lessons together with the teachers, to uncover student learning of the English language in the Singapore classroom.

About the author Lydia Tan-Chia is a Senior Curriculum Specialist with the English Language and Literature Branch, Ministry of Education, Singapore. She wishes to thank the Principals, Heads of English, Level Heads, Instructional Leaders and teachers of the seven schools that participated in the En-ELT Project 2011–2012.

Lesson Study as a Means of Reform

by Eisuke Saito

Find out how a veteran educator used lesson study to rebuild the learning culture in a Japanese school and what tips he has for Singapore school teachers embarking on lesson study.

Gakuyo Junior High School was badly in need of reform when Mr Masaaki Sato took over as principal. The teachers were burnt out. The students didn't study. Some of them were even violent—students were refusing to attend classes because of classroom bullying and they feared for their safety.

Mr Sato wanted to guarantee opportunities for every student to learn meaningfully and for every teacher to grow as a professional. He wanted parents to participate in the learning process. He wanted to rebuild Gakuyo as a learning community.

Making Change Happen

For the change to happen, Mr Sato used lesson study to introduce pedagogical reforms. The teachers were grouped into study teams. They made observations and reflections based on research findings and had informal discussions on lesson planning.

Lesson study teams are usually organized by subject departments. However, such teams tend to discuss only teaching methods, planning or subject matters. To encourage teachers to go beyond subject boundaries and think about their students and how they learn, Gakuyo's teams were organized by grade levels.

Within 6 months, every student was participating in the learning process, when few of them had shown interest in their lessons before. Previously ranked 11th among 14 schools in the area, Gakuyo rose to become Number 3 within 2 years.

Article highlights

- How did lesson study help to reform a Japanese high school?
- What should teachers consider when using lesson study?
- How should teachers juggle lesson study and other duties?

Lesson study should not be seen as a fad. It has to be a long-term process of steady and continuous learning for teachers.

- Eisuke Saito,
*Curriculum, Teaching and Learning
Academic Group*

The reforms Mr Sato brought about in Gakuyo made him well known all over Japan. He is now a retired educational consultant and works with approximately 80 schools in the country, spending around 250 days a year participating in research lessons.

School Reform in Asia

I met Mr Sato while working on a project with Science and Math teachers in Indonesia, way back in 2005. I struggled with a problem—the learning gained by Science and Math teachers was never shared with the rest of the teachers in the schools under the project.

Mr Sato's experience showed me the direction. A systemic attempt involving the entire school would be necessary when introducing lesson study. This was a lesson I learned.

I invited Mr Sato to the places I was working in—Indonesia, Vietnam and Singapore. Since then, he has visited our island country thrice and worked with two schools here: Jurong Primary School and Hillgrove Secondary School.

Teachers in both schools have been actively engaged in lesson study for the last couple of years. Mr Sato has expressed his pleasure at the schools' progress since his first visit. He was very impressed with the collegiality and the strong leadership in both schools. Further, he was fascinated by the teachers' caring attitudes and their enthusiasm in providing better education for their students.

At the same time, Mr Sato pointed out some concerns that the teachers could take up. He shared his points by showing scenes from videos that he recorded while observing lessons. They are universal, applicable not only in Singapore but also in other countries.

For example, while conducting lessons, teachers must observe how the students learn and improvise their teaching methods when needed. What should teachers do if students become confused or start to sleep in class? What should they do when some children in activity groups are still engaged in the activities when others have finished?

If some students don't work with peers in pairs or groups, what should be done? When a group of children make a presentation and few listen, what kinds of habits should be developed through daily practice?

Challenges to Implementing Lesson Study

The teachers in these schools have certainly been doing a wonderful job. But there is one thing they cannot avoid—staff turnover. When important leaders are transferred out periodically, it is a great loss for the schools.

Teachers should, however, see the infusion of new colleagues as an opportunity. By explaining to these new members the goals, framework and reasons for lesson study, they can reaffirm the vision they want to pursue through the lesson study activities. They can also re-consider the method for achieving these goals.

Lesson study should not be seen as a fad. It has to be a long-term process of steady and continuous learning for teachers. However, to achieve that purpose, time is an important factor.

Mr Sato believes that the best analogy for the teaching profession is juggling. While teachers are already busy juggling their various duties, they now have another ball thrown in: lesson study!

Educators tend to think only about adding more work to their existing load. However, sometimes, it is important to consider taking away some work in order for them to fit in lesson study.

In the classroom, there are many "stories" of children and teachers unfolding concurrently. These can be very minor, but very important—much can be gleaned from them about our students. Without enough reflection, it is very difficult to improve the children and oneself. The practice of lesson study can help teachers to notice and capture those stories and reflect on them.



Masaako Sato wanted to rebuild Gakuyo as a learning community through the use of lesson study

About the author Eisuke Saito is an Assistant Professor with NIE's Curriculum, Teaching and Learning Academic Group.