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Adapting and Implementing Japanese Lesson Study:
Some Affordances and Constraints

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Abstract
Adaptations of Japanese Lesson Study have flourished worldwide in the last decade. This paper explores some of the affordances and hindrances to Japanese Lesson Study being implemented in the Australian context. These include: teaching being viewed as a public or a private activity; the status of teachers; generalist as opposed to specialist teachers in primary schools; time constraints and number of hours per week of teaching; a focus on a classroom as a community of learners as opposed to a focus on individual differences; the breadth, depth and structure of the curriculum; and opportunities for and dispositions towards detailed study of mathematical content.

Keywords: Lesson Study, professional development, cross-cultural perspectives

In Japan, Lesson Study occurs across many curriculum areas, mainly at the elementary (primary) school level, and to a lesser extent junior secondary. Lewis (2002) describes the Lesson Study Cycle as having four phases: goal-setting and planning, including the development of the Lesson Plan; teaching the research lesson, which enables the lesson observation; the post-lesson discussion; and the resulting consolidation of learning, which has many far-reaching consequences (see, for example, Lewis & Tsuchida, 1998). In mathematics, the research lesson usually follows the typical lesson pattern for a Japanese structured problem-solving lesson. For major characteristics of such lessons, see Shimizu, 2009.

Lesson Study has many similarities with some of the activities of school-based Teaching Research Groups (TRGs) that have existed for over half a century in mainland China (Yang, 2009).

Japanese Lesson Study first came to world-wide attention through Makoto Yoshida’s doctoral dissertation (Yoshida, 1999; Fernandez & Yoshida, 2004), and Stigler and Hiebert’s (1999) accounts of Lesson Study based on the Third International Mathematics and Science Study (TIMSS).

By 2004, Lesson Study was taking place in the USA in at least 32 states and 150 lesson study clusters. However, as Perry and Lewis (2008) point out, the likely impact of Lesson Study in the USA is uncertain not only because it may be seen as the latest in a series of “fads”, but also because its cultural underpinnings may not translate easily into the North American context.

In the United Kingdom there has been growing interest in, and government support for, Lesson Study as a powerful form of professional development (see, for example, Department for Children, Schools and Families, 2008). However, participants in UK Lesson Study projects often note that it is not until they experience Lesson Study in Japan that they begin to appreciate its full potential (Robinson, 2007).

There have been a number of small-scale attempts at Lesson Study in Australia (see, for example, Hollingsworth & Oliver, 2005), but as Stephens (in APEC-HRD Lesson Study Project, nd) points out, “schools need assistance to engage more deeply in the research phase, and to see Lesson Study as part of an ongoing cycle of improvement.”
Adaptations of Japanese Lesson Study are being implemented, often in small ways, in many other countries, including Chile, Indonesia, Malaysia, Mexico, Peru, Philippines, Singapore, Thailand, and Vietnam (APEC-HRD Lesson Study Project, nd).

Based on the authors' experiences in Australia, Japan, China, and the Czech Republic (see, for example, Groves, 2009; Doig, Groves, & Fuji, submitted; Doig, Groves, & Macháčková, 2009), this paper adopts an Australian perspective on examining some of the affordances and constraints in the adaptation and implementation of Japanese Lesson Study outside Japan.

These affordances and constraints are discussed under three headings – cultural issues, school contexts, and the research lessons – as these provide useful lenses for understanding some of the key issues involved.

**Cultural Issues**

As Stigler and Hiebert (1999) point out, our efforts at improving teaching often ignore the fact that teaching is a cultural activity. The phenomenal growth of Lesson Study as a vehicle for professional development, primarily in the USA, but also elsewhere, has highlighted some of the cultural assumptions underlying Japanese Lesson Study and raised questions about the extent to which it can be replicated elsewhere.

In this section, we will explore some of the affordances and constraints posed by cultural factors.

**Tradition**

Lesson Study in Japan has a history going back to the early 1900s. While it is essentially a voluntary activity, the process is highly valued by Japanese teachers, many of whom cannot imagine doing without it, and it is seen as underpinning educational change and innovation in Japan. However, while the vast majority of elementary schools and many middle schools take part in Lesson Study, it is rarely carried out in Japanese high schools (Fernandez & Yoshida, 2004).

In mainland China, Teaching Research Groups (TRGs) have existed in all schools for over half a century (Yang, 2009). These groups, which are mandated by the government, conduct a number of different activities, some of which closely resemble (or are even sometimes seen as being identical to) Japanese Lesson Study. When the authors visited China recently, they were frequently asked to describe Australian Lesson Study. The fact that Lesson Study is not a common form of professional development in Australia was met with some amazement.

In Australia, not only is there no tradition of Lesson Study, but in a recent study only a quarter of secondary mathematics teachers valued continuing professional development, and of these the largest percentage (31%) viewed general pedagogy as most useful, compared with 8% who wanted a curriculum specific focus (Harris & Jensz, 2006).

Joint lesson planning, within year level or other teams, is a common practice in Australian schools. However, not only is there no tradition of Lesson Study, but priorities for professional development and educational policies are the province of state governments and prone to frequent changes. These factors are significant constraints to the adoption of Lesson Study as a vehicle for continuing professional development.

**Teaching as a public activity**

The Lesson Study tradition in Japan supports teaching as a public activity, where teachers' classroom performances are open to collegial scrutiny and comment. This aspect of Japanese teaching culture contrasts strongly with Australian teachers'
relative isolation within their own classroom and the fact that in Australia teaching is seen very much as a private activity.

A powerful illustration of this occurred some time ago in a research project conducted by one of the authors in six schools. At one stage, teachers from one school visited another school to observe lessons. A teacher later asked the author to organise a “visit” to the next-door classroom at her own school to observe a similar lesson. While this request came as a surprise to the author, who could not understand why an outsider’s assistance was needed to facilitate an observation in the room next door, it illustrates the extent to which it is not common practice in Australia to observe lessons in one another’s classes.

Unfortunately, most Australian teachers’ experiences of observing lessons or being observed teaching comes only from their pre-service teacher education days. A small number may have watched a “demonstration lesson” at some time – a rare experience – while most have heard about the “bad old days” when inspectors came to observe and rate teachers. Thus, a significant constraint on Australian teachers taking part in Lesson Study is their lack of experience in analysing observed lessons in any but the most superficial, evaluative way.

The status of teachers
A significant difference between Australian and East Asian teachers is their status in the community. While teaching is a highly prestigious and well-paid occupation in Japan (see, for example, Lewis, 1995), this is no longer the case in Australia. Individual Australian teachers may be well respected, but as a group, teachers are not held in the same high regard as those in Japan.

Some reasons for the relatively low status of Australian teachers may stem from the comparatively low university entrance score needed to enrol in teacher education programs and low teacher salaries, although starting salaries at least have improved considerably in recent years. By way of contrast, Pang (2009) describes the Korean situation, where teaching is a highly respected and popular profession, with favourable hours and salary. As a result, being employed as a teacher is a highly competitive process, with outstanding high school graduates entering teacher education course, and even then facing a highly competitive further examination requiring evidence of “deep knowledge of pure mathematics, a profound understanding of school mathematics, and a competent performance of teaching” (p. 360).

One consequence of the relatively high status of teachers is stability in the profession. In countries such as Japan and Korea, teaching is seen as a life-long profession. In Australia, while most teachers enter the profession with long-term expectations, a disturbingly high proportion of early career teachers leave the profession during the first five years (Manuel, 2003). Such instability, together with the lack of a tradition of Lesson Study and the constantly changing models of teacher professional development, makes it difficult to initiate what is a necessarily long-term commitment to professional development through Lesson Study.

A focus on learning as a community rather than an individual activity
A striking aspect of classrooms in Japan is the focus on the classroom as a community of learners as opposed to a focus on individual differences (Watkins & Biggs, 1996). Lewis (1995) describes at length the ways in which community is built in elementary school classrooms through a range of strategies, including the thoughtful, deliberate creation and maintenance of ongoing small groups that form the underlying structure for lessons as well as for out of class activities such as eating lunch, playing games, and cleaning the school. These groups focus on building long-term friendships, as well as taking responsibility for one another in terms of academic and non-academic activities, as well facilitating students’ active involvement in shaping classroom norms.
This is in contrast to group activities in many Western countries where groups are transient, often built on ability grouping rather than on complementary academic and non-academic criteria, and are asked to take part in activities that do not lend themselves to co-operation.

Moreover, in Japan, teachers and classes typically stay together for two years, with teachers spending almost the entire school day, including eating lunch, with their classes, thus enabling them to form close relationships with the students.

School Contexts
In this section, we will explore some of the affordances and constraints resulting from contextual factors and systemic influences on schools and schooling.

Teachers of primary school mathematics
In both Japan and Australia, primary teachers are generalists who teach most subjects. This is in contrast with countries such as China and Malaysia, where, even at the primary school level, specialist teachers teach mathematics and other subjects. In Japan, as discussed above, this means that teachers spend almost the entire school day with their students. In Australia, while all primary teachers are normally expected to teach language, mathematics, science and what could loosely be termed "social studies", it is up to schools how they deploy their staff, with many schools employing specialist teachers for subjects such as physical education, art and music. Such practice is seen by teachers as having both positive and negative aspects - while classroom teachers get more time to plan lessons and can concentrate their efforts into fewer curriculum areas, they often say that having more "specialist teachers" results in their having less time to spend with their classes and less time to spend on core subjects, as well as resulting in larger class sizes - although classes are still much smaller than is the case in China, and in most cases in Japan.

The situation in China is at the far end of the spectrum, with many teachers teaching only mathematics, and sometimes, at least within a particular year, only one grade level. While this necessarily means less interaction with and knowledge of individual students, it allows teachers to focus in great detail on each lesson and refine it before teaching it again to another class, in a way that is not possible in most other countries.

Time
As Japanese and Australian teachers teach all or almost all subjects, they spend most of the school day teaching. In both cases, teachers typically teach about 20 hours per week. In China, in the primary schools visited by the authors in 2009, teachers of mathematics typically taught about 10 hours per week. Not only did this mean that they had more time for planning, but that there were significantly more opportunities for Lesson Study type activities to take place. These could be scheduled easily during school hours and, where there were conflicts with scheduled classes (especially those that only involved "home group" activities), it was possible to exchange classes with other teachers. Moreover, because teachers were mathematics specialists, they were not expected to take part in professional development across a wide range of subject areas, as would be the case in Australia and, to a lesser extent, Japan. So it is possible to participate in an ongoing sequence of Lesson Study type professional development activities.

In Japan, while the preparation for Lesson Study takes place outside school hours, the long-standing tradition of Lesson Study allows flexible arrangements to be made for conducting the observed lessons and the post-lesson debriefing discussions.

In Australia, a major constraint to such activity is the fact that most schools would need to employ casual teachers to take the place of teachers observing lessons in
other classes or schools. This is a significant financial disincentive for the practice of Lesson Study, as is the fact that many teachers would be reluctant to use “their own” time for lesson planning for a research lesson.

**Curriculum issues**

As a result of the *Third International Mathematics and Science Study* (TIMSS), the mathematics curriculum in the USA is often referred to as being “a mile wide and an inch deep”. This contrasts sharply with Japan’s “frugal, shared curriculum” (Lewis & Tsuchida, 1998, p. 35) and the clearly shared vision of what Japanese mathematics teaching should look like.

In Australia, the focus for the past 15 years on an outcomes-based curriculum has led to subjects like mathematics being described through a detailed list of outcome statements, usually divided into topics and sub-topics, set out longitudinally by levels of achievement. A plethora of outcomes are to be reported against, and it is this minutia that teachers and others claim to be strangling more effective approaches to teaching mathematics (see, for example, Doig, 2009). This aspect is so apparent that Australian primary school principals and teachers, after viewing a short video vignette of one Japanese lesson (Doig, Groves & Splitter, 2001), remarked that while they would want to use the Japanese approach they were severely constrained by the fragmented, outcome-based curriculum.

Education in Australia is a state responsibility, and, until now, all curriculum decisions have been a matter for individual states and territories. However, Australia is now in the process of developing its first National Curriculum in English, mathematics, science and history, with pilots starting in some states and territories in 2011. While the introduction of a National Curriculum is highly contested, there are some clear benefits. Wiburg and Brown (2006) identify the lack of a common mathematics curriculum as a major barrier to the successful introduction of Lesson Study in the USA, commenting further that one of the most successful implementations was in a school district that used only one curriculum and text in all its schools.

**The Research Lessons**

The research lesson is the focal point of Lesson Study. In this section we examine some of the features of these research lessons and the extent to which adapting and implementing Japanese Lesson Study in other countries and cultures depends on adopting the typical structure of Japanese research lessons.

**Types of lessons**

In mathematics, Japanese Lesson Study is usually based on a “structured problem-solving” research lesson, which is typically characterised as having four stages: posing the problem; students solving problems individually, in pairs or small groups; whole-class discussion; and summing up. Typically such lessons have a single focus — for example, the concept of a circle — and address a single problem — for example, how to make a game of “quoids” fair (see Doig, Groves & Fujii, submitted).

In China, research lessons are more likely to contain a small number of carefully sequenced tasks. These lessons are part of the normal sequence of lessons and are, in that sense, “ordinary lessons”. In both cases, the lessons are clearly embedded in a careful sequence within a unit of work and the broader curriculum.

Neither of these models of lessons fits well with “typical” Australian lessons, where a common practice of textbook writers is to take the curriculum content and fragment major topics such as number, geometry, and measurement into smaller topics that can be taught in a single school term. In this way, each major topic is “visited” every term, and is, usually, seen as an example of Bruner’s spiral curriculum notion. Next, sub-topics are divided into smaller parts that can be taught in a single lesson. But these are...
presented in the textbook on non-consecutive pages. A consequence of this is that these myriad parts of the curriculum are inter-leaved, and no coherent or sustained learning takes place. To complete the disarray, each page of the textbook may have two or three different aspects of these parts per page or even material relating to quite different topics. Thus Australian primary teachers are supported by textbooks, and other materials, that suggest that an "atomized" curriculum is both efficient and effective, despite the fact that research into the practices of effective teachers does not support the use of such "atoms". This research suggests, on the other hand, that effective teachers implement sequences of lessons rather than single one-off activities and that they make explicit connections between ideas (Doig, 2003).

By way of contrast, Japanese teachers are supported by having access to a complete set of coherent, focussed lessons, as well as by their students having developed an "organised mental 'script' of a mathematics lesson" (Lewis, 1995, p. 197). Moreover, while Australian teachers wonder how an entire lesson can focus on a problem such as "13 - 9", it is clear that students understand that finding the answer is not the real problem being presented to them, but rather that through the presentation of the problem and its position in a sequence of lessons, they are really being asked to focus on different strategies and their application to different problem types (Doig, Groves & Fujii, submitted).

A focus on mathematics
In Japan, Lesson Study in mathematics will usually be supported by an outside "expert" in mathematics. In addition, there is usually a teacher in the school who is regarded as a leader in mathematics.

Ma (1995) speaks of Chinese teachers' "profound understanding of fundamental mathematics" and how this is developed through "studying teaching materials intensively ... when teaching it" (p. 130).

Figure 1. Czech grade 3 children's solutions to the pizza problem

By way of contrast, when the authors conducted an abbreviated Lesson Study cycle in a workshop across three days at an international conference (see Doig, Groves, & Macháčková, 2009), it became apparent that many participants had little in-depth knowledge of the content relating to fractions (ourselves included) or experience in studying teaching materials. Moreover, they were sceptical that the grade 3 students would be able to come up with different solutions to the problem of dividing three pizzas equally between four people – despite the fact that the teacher, Jana Macháčková, assured them that many solutions would be found. Several participants were also clearly concerned that there was only one problem and that it would not be solved using concrete materials, with suggestions including the use of paper plates to cut out or colour. In fact, the five children who participated produced a total of 26 (mainly different) solutions, some of which can be seen in Figure 1. There were clear differences among participants, apparently based on country of origin. This experience,
with an international group of mathematics educators, highlights the lack of opportunity for and disposition towards detailed study of mathematical content in many countries.

**Conclusion**

Our own interest in Lesson Study grew from our long-standing commitment to mathematics classrooms functioning as communities of inquiry (see, for example, Doig, Groves & Splitter, 2001). A major consideration in adopting Lesson Study as professional development is the question of what is being adapted and implemented: is it the process of Lesson Study or is it the Japanese structured problem-solving lesson? While many of the factors identified above as posing constraints on the adoption of Lesson Study relate to the process, others, which may in fact constitute greater barriers, relate to the nature of the Japanese structured problem-solving lesson.

In contrast to the crowded Australian curriculum, the "frugal" Japanese mathematics curriculum affords both opportunities for, and dispositions towards, a detailed study of mathematical content. It provides time for longer-term, deeper, study of a more limited number of mathematical topics, which leads to more understanding of concepts, greater skill development, and overall better achievement by all students in the class.

**References**


