

What is Lesson Study?

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Introduction

International comparisons have driven the globalization of lesson studies, initially from what was presumed to be its methodological roots in Japanese primary schools westwards. A major influence was its rapid dissemination at the end of the 20th century to the USA via James Stigler and James Hiebert's *The Teaching Gap* (1999, updated 2009). Their book was based on their participation in cross-cultural comparisons of teaching methods in the field of mathematics education within Japan, Germany and the US under the sponsorship of the TIMMS (Trends in International Mathematics and Science Study) for 1997.

The TIMMS tests across 41 countries in 1995 revealed significant differences in measured educational attainment between students of all ages in Asian countries - Singapore, Taiwan, Japan, Hong Kong - and students in the USA and other western countries.

To understand the context that contributes to achievement, TIMSS researchers in Germany, Japan, and the United States collaborated to complete videotapes of instruction in eighth-grade mathematics classrooms. Teams of bilingual researchers observed classrooms and interviewed education authorities, principals, teachers, students, and parents for three months in each of the three countries. Topics studied included education standards, methods of dealing with individual differences, the lives and working conditions of teachers, and the role of school in adolescents' lives. (Classroom Compass. The TIMSS: Looking at Classrooms around the World, Spring 1997, Volume 3 Number 3).

Stigler and Hiebert (2009) argue:

The teaching gap we describe refers to the differences between the kinds of teaching needed to achieve the educational dreams of the American people and the kind of teaching found in most American schools. Although many of the American teachers we observed were highly competent at implementing American teaching methods, the methods themselves were severely limited (pp. xviii–xix)

Their work in the TIMMS cross-cultural video-analysis suggested that the teaching gap in Japan was far less evident than in the US. The teaching they observed in each country appeared to be shaped by different *cultural scripts*; beliefs and assumptions about how to engage students with subject content. In Japan, the cultural scripts employed by teachers appeared to shape methods that are more consistent with socially mandated learning goals. In contrast, the cultural scripts that underpin classroom practice in the United States appeared to be dysfunctional.

Stigler and Hiebert claimed (2009 p 33) that it is highly problematic to conclude from the design of their 1995 study that the teaching methods used in Japan had anything to do with their high levels of performance on tests. If the methods used in other high performing countries differed from those used in Japan, “we would conclude that there are other ways to teach maths effectively (p33).” Stigler and Hiebert therefore embarked in 1999 on a further video-study of teaching, which included in the sample, in addition to Japan, more high achieving countries (Czech Republic, Hong Kong, The Netherlands, and Switzerland). They found considerable variation in teaching methods, but they all had one thing in common; namely, shared learning goals connected to the process of ‘deepening and developing understanding’ of curriculum content. The methods all “accomplished the engagement of students in active struggles with core mathematics concepts and procedures (2009, p34).” The learning goals appeared to refer to qualities inherent in the process of learning itself, rather than solely in its outcomes.

Stigler and Hiebert asked how the teaching gap evident in the less achieving countries might be reduced by developing new cultural scripts, which can serve as a basis for innovatory and more effective teaching methods? Their comparative video study pinpointed a method that had evolved in Japanese primary schools over a period of 50 years to effectively transform the culture of teaching and learning. This method is called lesson study (*jugyou kenkyuu*) and casts teachers in the role of researchers as the primary agents of cultural change in classrooms.

Reviewing *The Teaching Gap* (1999) online, after publication, an American primary school teacher, Paul MacFarlane, depicted this method in the following terms from a teacher’s perspective (2000):

In their regular meetings, these teachers don't just sit and complain about the many stresses in their lives. Among other things, they all participate in developing model lessons. They usually do this in departmental groups of 5 to 7 teachers. --- And after it's all hashed out, one of them volunteers to teach it to a class. On that day, all the other teachers in the group show up to the class and watch it being taught. --- Next, they revise the lesson in the light of their initial experiences and teach it again, perhaps with a different member of the group doing the actual teaching. Eventually they invite the entire faculty of the department to view it being taught. The whole process can take an entire year for a single lesson. ([www.tell.com/-schafer/teachgap,htm](http://www.tell.com/-schafer/teachgap.htm)).

It is interesting to compare the above account of lesson study with the extract below, from the *Harvard Educational Review* 71(4). Although similar in many respects they suggest slightly different readings of Stigler and Hiebert.

With lesson study, improving teaching takes place in the context of a classroom lesson. Teachers meet together to develop "research lessons." They define a problem to guide their work, plan a lesson, have one teacher teach the lesson while the others observe it, evaluate and reflect on the lesson as a group, revise the lesson, teach the revised lesson, evaluate and reflect once again, and share the results. What is striking about lesson study is that it is based on a long-term, continuous improvement model.

The teacher's account suggests that the main purpose of a cyclical pattern of *research lessons* is to produce a *model lesson* by perfecting the lesson plan. The *HER* account outlines an initial phase of lesson study in which a group of teachers participate in defining a problem to guide their lesson research. This implies that the main purpose of lesson study is to deepen insights into the problems teachers identify in their classrooms, and to propose and test possible solutions in the light of them. Such a purpose is not about perfecting a particular lesson plan. Rather it is about deepening practically significant insights into a problematic aspect of teaching. However, this is a continuous, ongoing process in which the lesson plan functions as a specification of diagnostic and action hypotheses to be tested in the context of a particular *research lesson*. Another difference between the two accounts of lesson study lies in how the final phase of the study is depicted. In the former, the model lesson is demonstrated to a group of peers in the school. In the latter the findings of the lesson research are treated as provisional, and then shared with other teachers as a platform for further lesson studies aimed at improving

teaching and learning in relation to an aspect of classroom practice that has been widely experienced by teachers as problematic.

The publication of *The Teaching Gap* in the USA appears to have stimulated rather different understandings of the lesson study method, posing the question ‘what is lesson study?’ from the very beginning of the process of globalization.

Pedagogical principles underpinning lesson study.

Stigler and Hiebert discerned six principles for improving teaching to implicitly underpin Japanese lesson study method (1999 pp 132-137), and claimed that these could be used as a basis for adapting and elaborating lesson study for use in the US (see Bartalo, 2012 pp. 10-11). Arguably, they might well also underpin the *improving teaching methodologies* of the other high achieving countries (see the OECD 2009 Report cited later). My own interest in these principles is that they provide an explicit framework for connecting and linking the Japanese lesson study method with other pedagogical ideas and in doing so enable us to address the question ‘what is lesson study?’ in a global context.

I have argued (Elliott 2012 pp.108-125) that lesson study is under-theorized in Japan. Stigler and Hiebert (2016) apparently agree. They argue that “much of the theory behind lesson study is implicit, and also bound up with wider beliefs about teaching and learning” (p 5). They point out that as Japanese (and also Chinese) lesson study has globalized its exponents have felt compelled to render the tacit theories that underpin it more explicit, “with respect to both its goals and the methods for achieving them” (p 3). An explicit theory of lesson study, they claim, “helps educators understand which parts of lesson study are critical for a given purpose and which parts are not” and also “makes it possible to adapt what is essentially a cultural practice or routine to a new setting” (p 3). With respect to the latter, Stigler and Hiebert (2016 p 4) suggest it may not be possible to replicate even a well-conceptualized cultural practice in a straightforward way. Instead lesson study might “be developed most effectively in other countries by fitting it into the context of related ideas that already have a place in the countries’ various education systems”(p.4). It is this ambition that underpins the rest of this paper.

Some adaptations of the theory and practice of lesson study, as it globally circulates, will be consistent with the framework of principles outlined by Stigler and Hiebert, while others will not. For example, in what follows I shall argue

that lesson study informed by Stenhouse's idea of *the teacher as researcher* and his *process model* of curriculum design, and Marton and Booth's pedagogical *theory of variation* are consistent with the principles, while lesson study shaped by the *behavioral objectives model* of curriculum and pedagogical design is not. Although the framework is open to lesson study being understood in relation to a variety of ideas - not just those explored in this paper - it does set limits on what can count as authentic lesson study as it traverses different global settings.

1.Expect Improvement to Be Continual, Gradual, and Incremental.

Stigler and Hiebert (1999) recognize that improvements cannot be accomplished in the short term overnight. Constraints emanating from the professional culture of teachers, in the form of the cultural scripts that shape their practice, and the organizational culture of schooling, which reinforces them, need to be identified, and action strategies for ameliorating them developed and tested. (Stigler & Hiebert, 1999, pp 135–136). A view of lesson study as a method for producing a model lesson is inconsistent with this principle, whereas one that views the purpose as addressing a persistent and widespread pedagogical problem is not.

Takahashi and McDougall (2016) examined the 'Lesson Study' projects that have emerged in the USA, and which "clearly deviated from Japanese Lesson Study and the research on Japanese Lesson Study". They concluded (p.6) that "the following features are key for effective Lesson Study":

1. *Participants engage in Lesson Study to build expertise and learn something new, not simply to refine a certain lesson.*
2. *The Lesson Study is part of a highly structured, school-wide or district-wide process.*
3. *It includes significant time spent on kyouzai kenkyuu, the "study of teaching materials."*
4. *It is done over several weeks, rather than just a few hours.*
5. *Knowledgeable others contribute insights during the post-lesson discussion and during planning as well.*

In the light of these features they dropped the term *lesson study* in the US context and replaced it with *Collaborative Lesson Research* (CLR) to depict an approach which has the following components (p.6):

1. *A clear research purpose*
2. *Kyouzai kenkyuu, the "study of teaching materials"*

3. *A written research proposal*
4. *A live research lesson and discussion*
5. *Knowledgeable others*
6. *Sharing of results*

Takahashi and McDougall claim that the research focus of CLR has two layers, which includes involving teachers in identifying a) a shared research theme as a group, a school, a district in the form of a long-term learning goal, such as building students' capabilities as *problem-solvers* or *self-directed learners*; b) the specific discipline (e.g., mathematics) and topic (e.g. fractions) where they will situate their investigation of the research theme, and to study this topic in some depth.

The above account of CLR renders it virtually indistinguishable from the idea of *the teacher as researcher* and the *classroom action research* movement that emerged in the UK from the work of Lawrence Stenhouse and others in *The Humanities Curriculum Project* on teaching controversial issues in schools (see Stenhouse 1975, Rudduck 1983, Elliott & Norris Eds. 2012; Elliott, 1991).

2. Maintain a Constant Focus on Student Learning Goals.

The purpose of good teaching is good learning. In this respect there may appear to be ambiguous and contradictory understandings of the concept of 'learning'. In one sense, it can be understood in terms of its intended impact on the behavior of learners, as benchmarked by standardized tests. In another sense, it can be understood as a process in which students engage with the content of the lesson by asking questions, expressing their points of view, proposing and testing solutions to problems posed by the content, and reflecting about possible errors in their understandings. In the latter respect *learning goals* refer to standards of thinking that are internal to the process of learning rather than *intended learning outcomes*. In the context of lesson study Stigler and Hiebert clearly view *a constant focus on student learning goals* to imply a *critical model* rather than an *objectives model* of student assessment (see Stenhouse 1975 pp 94-97). In the former teachers critically engage with students' responses in lessons to directly improve learning in situ.

For Stigler and Hiebert the phrase "*teaching gap*" refers to gaps between teaching strategies and standards that are internal to the learning process. Such gaps involve a failure to connect teaching strategically with an educationally

worthwhile learning process. Bartalo (2012, pp. 10-11) complements Stigler and Hiebert's research by providing a comprehensive list of gaps he believes are evidenced in US classrooms e.g. in the form of teaching that does not:

- *give students constructive targeted feedback that enhances the quality of their learning.*
- *help student to make connections between new learning and what they already know.*
- *help students to become self-directed learners with the ability to monitor and adjust their approaches to learning.*
- *help students connect facts with major concepts, big ideas, and general principles for a deeper understanding.*
- *develop opportunities for students to see the relevance in what they are learning.*
- *create opportunities for students to question what they are learning, relate new ideas to old ones, and apply an idea to a real problem.*

Such statements imply a failure to realize a pedagogically significant *procedural principle* that links teaching and learning as a unified process. Stigler and Hiebert observed that clarifying such principles, identifying problems in realizing them in classrooms, and proposing and testing action-strategies aimed at resolving them, are integral to the Japanese lesson study method.

There is a high degree of consistency between Stigler and Hiebert's conception of what it means to "maintain a constant focus on student learning goals" through lesson study and Stenhouse's use (1975 Ch.7) of the *process model* of curriculum design to support teachers' classroom action research in the UK. He and his colleagues work with teachers in the Humanities Project (see Stenhouse 1968) is an excellent example of *Kyouzai Kenkuu* in which 'knowledgeable others' designed a curriculum proposal for teachers to experimentally test through action research in their classrooms. Stenhouse argued that:

educational ideas expressed in books are not easily taken into possession by teachers, whereas the expression of ideas as curricular specifications exposes them to testing by teachers and hence establishes an equality of discourse between the proposer and those who assist his proposal. (1975 p.142).

As with the use of the *process model* to inform 'the teachers as researchers' movement in the UK, so with the lesson study method; both embodied a perspective on students' and teachers' learning that enabled teachers to close *the teaching gap*, while resisting the temptation to teach directly to the prevailing system of tests and examinations.

It is interesting to note that both lesson study in Japan and later the *teachers as researchers* movement in the UK emerged in curriculum reform contexts, which were characterized by the aspiration to reconstruct curricula content as *objects of understanding*. However, the difference between these two approaches lies in the fact that in Japan lesson study now tends to operate with a tacit pedagogical theory about *teaching for understanding*, whereas teacher research in the UK has more recently operated with explicit pedagogical theories cast in the form of procedural principles. In the Japanese context teachers have participated in a long tradition of improving the curriculum by adopting a research stance towards their teaching. In the UK and elsewhere, as lesson study globalizes, its use to effect high quality curriculum development in contextually complex situations may require it to be informed by an explicit pedagogical theory.

Stenhouse believed that teachers' use of an explicit pedagogical theory would help them to systematically structure their understanding of their work in classrooms (1975 p.157); claiming that "a common vocabulary of concepts and a syntax of theory" were essential if teachers were to communicate with each other about their work in classrooms. He believed that professional researchers, operating as 'knowledgeable others', should be able to assist with the development of "a general theoretical language". Such a theory, he argued, should not simply be applied to structure teachers understanding of their work but also in the process become objects of reflection themselves and tested, revised, and further developed by teachers (1975 p. 142).

One early example of the use of an explicit pedagogical theory to inform teachers' lesson studies in the context of globalization, emerged in Hong Kong during the post-colonial curriculum reforms. Lo and her colleagues at the *Centre for Learning Studies and School Experience* in the former Hong Kong Institute for Education synthesized Japanese lesson study method with a *phenomenographic* learning theory developed initially by Marton and Booth (1997) at the University of Gothenburg in Sweden. This theory, known as *variation theory* focused on understanding the learner's *experience* (discernment) of the *objects of learning*.

Lo and Pong (2005 pp. 10-11) summarize the findings on which variation theory is based:

1. *People experience the same phenomenon in qualitatively different ways;*
2. *Variation will tend to be limited to certain patterns;*
3. *Students bring their own ideas and beliefs into the formal learning situation and these may conflict with what the teacher tries to teach. Students understand the same curriculum material or teaching act differently;*
4. *Variation in discernment of the same phenomenon will result in variable learning outcomes – as a norm rather than an exception;*
5. *Although people experience different understandings of the same object they often assume that others understand it in the same way as they do. Hence, it is only too easy for teachers to assume that their pupils will come to understand something in the way they intended.*

As Lo and Pong (2005 pp.9-26) make clear in developing variation theory to inform collaborative lesson research, such findings also imply that teachers will experience the phenomena they teach in qualitatively different ways and result in variable teaching strategies. This also casts the teacher in the role of a learner. Lo and Pong (2005, pp 9-26) distinguished three types of variation for *learning study*:

- ▶ V1 - variations in students' understandings of the object of learning;
- ▶ V2 - variations in teachers' understandings of, and ways of handling, the object of learning;
- ▶ V3 – variation as a guiding principle of pedagogical design, i.e. the use teachers make of different patterns of variation to enable pupils' to discern critical aspects of the object of learning, and thereby deepen and extend their understanding. In doing so they will draw on their knowledge of V1 and V2 to decide on what aspects to *focus*, which aspects to *vary simultaneously* and which aspects to *keep invariant and constant*.

The synthesis of Japanese lesson study method and Swedish variation theory resulted in elaborating the latter in the context of the former. Marton, as a visiting scholar in Hong Kong, fully supported the development of this synthesis between lesson study and the theory of variation. It came to be depicted as *learning study* because it unambiguously focused on pupils' experience of

learning and not simply on teaching methods. Marton and his former colleagues at Gothenburg University also came to promote *learning study* in the Swedish school system.

Variation theory resonated with the *process model* of 'developing an understanding' of curricula content. Stenhouse (1975, p 74) argued that:

Two implications of this aim are worth pointing out. First, it is implied that both students and teachers develop understanding, that is, the teacher is cast in the role of a learner. Second, understanding is chosen as an aim because it cannot be achieved. Understanding can always be deepened. Moreover, there must always be dispute as to what constitutes a valid understanding. The teacher and the group have to accept as part of their task an exploration of the nature of understanding.

Both implications of the *process model* are aspects of variation theory, which provided teachers engaged in lesson study with a theoretical language for analyzing and developing classroom practice together. The fundamental concept is that of the *object of learning*. The term refers to a worthwhile phenomenon that the student needs to experience as a learner, in the form of a concept, topic, situation, event, or artifact. However, according to Marton and Booth (1997 p. 161) it cannot be described independently of the learner's experience of it. As such it does not refer to any fixed endpoints of that experience in the form of pre-specified learning outcomes. From the standpoint of variation theory the object of learning "is constituted in the course of learning" and "learning is the constitution of the object of learning." Learning implies a change in the person-world relationship.

If a teacher wants to know what the *object of learning* is for the learner s(he) has to carry out an empirical investigation into the learner's ideas and beliefs about the object. The task will then be to use this information to deepen the learner's understanding of *the object of learning* by enlarging his/her awareness of *aspects* s(he) believes are *critical* for learning and which they may be neglecting. Any phenomenon can be seen in different ways depending on which aspects are discerned as critical. Learning is the discernment of critical aspects of the subject-matter that have not previously been discerned or noticed.

Teachers' tend to presume that their understandings of *the object of learning* will agree with each other and depict what it is really like, whereas according to the theory of variation they may well vary and conflict. Marton and Booth ask,

“Can the claim be justified that any other ‘expert’ would describe the same object in the same way? (p.162)” Rarely, they claim, could such a proposition be defended.

From the standpoint of variation theory *discernment and variation* are pedagogically connected. Students notice things when they stand out and change against a stable background or stay unchanged against a changing background. Marton et al (2004) and Lo and Marton (2012 pp. 7-22) discriminate four types of patterns of variation; *contrast, separation, generalization* and *fusion*. Such patterns can be used to structure the content of the curriculum in a way that draws the learners’ attention to its critical aspects (see Runesson and Gustafsson 2012 pp 246-247).

Variation theory establishes procedural principles for handling subject content in classrooms that are implied by the pedagogical aim of *developing an understanding of the objects of learning*. Marton and Booth point out that this aim does not imply that *the object of learning* is simply the learner’s experience of it, whether this refers to a pupil or teacher. They argue that “a phenomenon can be seen in terms of the complex of all the ways it may be experienced in the broadest sense of the word, most of them not known” (p.162). One learner’s way of experiencing a phenomenon can be linked to this “abstract complex of all the different ways of experiencing it as the part relates to the whole”. It then becomes possible to construct a collective account of learning as the development of an over-lapping consensus, which leaves continuing space for divergence of view, and the expression of original views. Japanese lesson study provides groups of teachers, working alongside ‘knowledgeable others’, with opportunities to develop such collective accounts as a basis for selecting patterns of variation to deepen and extend their pupils understanding of an object of learning. In these terms, on the collective level, Marton and Booth argue that learning is not simply the constitution of the object of learning by the individual but active “participation in the ongoing and constantly recurring constitution of the object of learning” (p.162). This applies to both pupils and teachers as learners in the process of lesson study.

Variation theory implies that understanding deepens when a number of critical aspects are discerned simultaneously. Such aspects may not be identifiable firmly in advance of the teaching-learning process. They are *enacted* within the process itself. Variation theory makes a distinction between the teacher’s *intended object of learning*, the pupils *felt object of learning*, and the *enacted*

object in the pedagogical situation. Hence, the *development of understanding* is viewed as a dynamic concept with no fixed predetermined end-point.

Variation theory and lesson study complement each other. As a pedagogical theory the former does not simply inform and structure improvements in classroom practice through lesson study but is itself tested and further developed through it. This process of jointly developing pedagogical theory and practice together is well illustrated in Ko's case study (2014 pp 272-289) of how a major claim embedded in variation theory - that *contrast* should precede *generalisation* - was tested and clarified by teachers in the course of a lesson study. Such dual development of pedagogical theory and practice in the context of what has become known as *learning study* is again consistent with a major aspect of the UK teachers as researchers movement.

3. Focus on Teaching, Not Teachers.

Stigler and Hiebert (1999) argue for a focus on "scripts for teaching" (p. 87); widely shared patterns in the mindset of teachers that shape their common practices in classrooms. Hence improving teaching by changing its underpinning cultural scripts requires a common focus and collaborative effort. Such a focus is very different from one which highlights the personal characteristics of individual teachers as objects of assessment and judgment.

Here again such a principle links to the idea of *the teacher as researcher* in which teachers develop and test hypotheses about the *cultural scripts* that shape their teaching, and if necessary change them in ways that are more consistent with their curriculum and pedagogical aims and the procedural principles they imply. Elliott and Adelman's Ford Teaching Project (1972-74), for example, engaged teachers in researching the way their *cultural scripts* impacted on the development of their students' capabilities for *self-directed learning* in the context of inquiry/discovery teaching (see Elliott 2007 pp.30-62). The project team collaborated with teachers to map out a framework of learning goals and procedural principles, and then asked them to develop and test a set of hypotheses about how to realise them in action (pp.41-42).

4. Make Improvements in Context.

Bartalo (2012) writes:

Stigler and Hiebert --- contend that American educators understand the importance of context when it comes to student learning, but not so much when

it comes to teacher learning. Too much of teacher learning, despite years of rhetoric about teachers learning in classrooms, is still focused on implementing programs or making data-based decisions rather than improving teaching methods.

The principle acknowledges the complex factors operating in the policy and organizational context of schooling that shapes teaching and learning in classrooms. They all need to be considered by policy makers and school leaders if they are to establish conditions that enable teachers to collaboratively improve their teaching. Innovative methods for improving teaching, like lesson study, cannot simply be borrowed from high performing nations like Japan without bringing about changes in the context of their use. Hence curriculum reforms may be proposed that aim to deepen students understanding of the nature and structure of the 'disciplines of knowledge' while the teaching methods do not significantly change.

One of the most neglected features of the globalization of lesson study phenomenon has been a lack of serious attention to the problems of effecting change in the dominant organizational culture of *individualism* that shapes schooling. Notable exceptions (see Elliott 2013 pp. 148-163, Brosnan 2014 pp. 236-251, Austin 2017, pp. 80-96) all highlight the importance of 'knowledgeable others' in sustaining a rigorous process of collaborative lesson research at the school level, and of school leaders in creating an organizational context for sustaining and using such research as integral to school development.

As lesson study has globalized from the Japanese educational system it appears to shape up conceptually, methodologically and practically rather differently than it did in its original national and socio-cultural context. Takahashi and McDougal (2018) report that:

Many Lesson Study projects outside of Japan omit some of the crucial elements, which hinders their success. For example, Fujii (National Council of Teachers of Mathematics 1989) examined Lesson Study in some African countries and noted that many aspects of Japanese Lesson Study are left out. The same occurs in America.

Takahashi, a mathematics teacher educator working in a USA university, was formerly an elementary school teacher in Japan. His 2018 paper with McDougal systematically lists important aspects of Japanese lesson study that are left out as the process globalizes west. These include:

1. The initial phase of lesson study; namely, the study of curriculum content and teaching materials (*kyouzai kenkyuu*) to gain knowledge and insight into both the subject matter and how students think in relation to it;
2. Severe compression of the time-frame for completion of all components of the lesson study cycle as practiced in Japan - planning, teaching/observing, analyzing/modifying lesson, teaching revised version of lesson – suggesting a surface plausibility to the claim that a school has been doing lesson study. The typical time-frame in Japan is 5 weeks while Takahashi and McDougal claim it may amount to as little as a day in the US.
3. Misunderstanding the purpose of lesson study as perfecting a specific lesson plan as opposed to gaining new knowledge and insight into the process of teaching and learning through research;
4. Misconstruing the purpose of lesson study as “showcasing the best practices” for teaching a subject e.g. by demonstrating innovative teaching strategies to an audience of professional peers. Takahashi and McDougal claim that such demonstrations may not help teachers serve the purpose of implementing educational ideas in practice. In Japan demonstration lessons (*shihan juyugyou*) are clearly distinguished from research lessons (*kenkyuu juyugyou*), which are specifically designed to serve this purpose.

Takahashi and McDougal's *Collaborative Lesson Research* (CLR) model explicitly challenges these global adaptations of lesson study and provides a focus for implementation on a sustainable basis. In doing so, it implies a radical transformation of the individualistic organizational culture that increasingly shapes schooling globally. It is the view of this author that, as with the idea of *teachers as researchers*, the main features of the CLR model depend for their realization on a wider *second-order action research* role for school leaders and 'knowledgeable others' from higher education institutions. In this role, major constraints in the organizational context of schooling are identified, and hypotheses about how they might be overcome are generated and tested.

Commenting on Stigler and Hiebert's (1999) proposal that schools should be restructured as places where teachers can learn, primary school teacher Macfarlane (2000 pp.27-30) responded that this phase of adaptation “has not been addressed at all, even though it's the only way that change will ever actually happen.” This is partly because, he argues, the need for it is not understood, and also because it is the most costly of the three phases “demanding every sort of resource you can think of, because it's a cultural change, and not a change of skills or style.” Hence, the use of time is both culturally shaped and costly.

MacFarlane gives the example of Stigler and Hiebert's surprise when a teacher engaged in a collaborative task suggests to colleagues that they leave early and spent time preparing for tomorrow's lessons at home. They felt that for him 'collaboration' did not make sense. Macfarlane offers a different interpretation; namely, that the teacher had no other time to prepare tomorrow's lessons if he collaborated with colleagues on the shared task. Changing 'cultural scripts' carries implications for the use of time and other resources in schools. Macfarlane concludes, "So I think that, in the implementation of their recommendations, Stigler and Hiebert have a much bigger fish to slay than they yet realize." Indeed, what has to be changed to counteract significant methodological distortion in the lesson study process is an organizational culture of schooling in which the 'key scripts' are driven by test data that serve the purpose of comparing student and teacher performance.

Over ten years later in the USA we find Stigler and Hiebert (2016) commending Takahashi and McDougal (2016) for addressing the above issues in the context of their model of *Collaborative Lesson Research*, as an adapted form of lesson study for the American school system.

(They) present a fascinating analysis-based on their own implementation experiences-of the kinds of organizational supports required to sustain lesson study in the American context ---

Several supports are essential if U.S. schools are to initiate and sustain C.L.R. The principal must lead the effort and enthusiastically endorse teachers' collaborative work to plan, teach, collect evidence, and revise lessons. Time and financial support must be provided by the administration to enable teachers to work together. The school also needs another advocate for CLR who persists in making sure the process continues. Finally the school must adopt a compelling school-wide goal so that all teachers are working with the same general purpose in mind (pp. 581-587).

It is my view that such a transformation requires school leaders and 'knowledgeable others' to adopt a second-order research stance.

5. Make improvements in the work of teachers.

One important indicator of a significant transformation in the organizational context of teaching is increasing support for the teacher's creative role as a curriculum designer. The teacher is not so much viewed as an implementer of curriculum policies and reforms conceived by others, but as a key decision maker in developing curricula in collaboration with the policy community. However, as

lesson study has globalized the vision of the teacher as a curriculum developer appears to have been replaced by the idea of the teacher as a curriculum implementer. In other words the cultural scripts that shape teaching as a practice in many countries are not constructed and authored by teachers as 'professional knowledge platforms'. They are increasingly constructed at the state level. It then becomes the task of lesson study to find ways of implementing them at the classroom and school level. This was evidenced in a special issue of the *International Journal of Lesson and Learning Studies* on 'Facilitating Curriculum Reforms' through lesson study as it globalized beyond Japan (2013,2:3). The issue consisted of case studies of the role of lesson study in the context of curriculum reform across a variety of countries. Interestingly the IJLLS has published *learning studies* authored by Swedish teachers engaged in curriculum development as part of a government funded doctoral programme (see Johansson, P & Thorsten, A 2017 pp. 45-55 and Lindstrom, C 2017 pp. 124-134). Could it be that in the Swedish education system curricula will tend to be viewed as *objects of learning*; to be continuously reconstituted through teachers' active participation in school-based curriculum research and development?

6. Build a system that can learn From Its own experience.

Stigler and Hiebert imagine an educational system that allows U.S. educators to "harvest" what good teachers are learning about teaching, and to share what they have learned so others can experiment with and try out innovative teaching methods. Lesson study is often viewed as *a method of teacher professional development*. Few teachers who have participated in the process will dispute this. However, the concept of professional development may simply be restricted to what the group of teachers undertaking the lesson study have learned. In Japan, the pedagogical knowledge developed by a lesson study group is shared with fellow professionals at school, district, and even national levels and may even influence the reconstruction of curriculum texts. Such groups – with teachers working alongside 'knowledgeable others' - participate through lesson study in the construction of *professional knowledge platforms*, which provide a source of hypotheses about how to resolve problems in teaching a particular object of learning. Such hypotheses can then be tested by other groups in the context of their particular classrooms and schools and revised accordingly. Therefore, it becomes possible to build professional knowledge cumulatively over time. This prevents a situation in which individual lesson study groups have to continually 'reinvent the wheel' of professional learning, and can instead build on each other's findings.

Earlier I indicated how *professional knowledge platforms* were constructed through action research in the Humanities Curriculum Project on teaching controversial issues and the Ford Teaching Project on inquiry/discovery teaching. Examples can also be found in the context of learning studies. Kullberg (2012, pp. 232-244) explored the extent to which the findings of a learning study about the density of decimal numbers could be used by a group of other teachers to improve their learners knowledge about the density of decimal numbers. The teachers identified and enacted at different stages in the learning process four critical features related to decimal numbers. This enabled learners to experience decimal numbers in different ways to make a significant impact on their learning about density. The critical features were then documented, and used by other teachers, selected for their familiarity with learning study and variation theory. It was found that the latter were able to design lessons, which enacted the critical features, in ways that significantly influenced their students' learning about the density of decimal numbers.

In the same volume of the IJLLS Runesson and Gustaffson (2012 pp. 245-260) demonstrated that the learning products of learning study could be shared and applied cross-culturally. It was found that a group of Swedish teachers were able to make use of, adapt and even improve on, the findings of learning studies conducted in Hong Kong.

The development of professional knowledge platforms for sharing and testing the findings of lesson research is in its infancy. It implies a pedagogical science in which teachers become the authors and co-authors of research reports. Currently the majority of published books and articles on lesson study are authored by academic facilitators and evaluators of the process, who view it largely as a methodology for locally restricted professional development. It is a context in which the pedagogical insights of teachers as researchers are unlikely to find full expression.

Some concluding remarks.

Stigler and Hiebert's research provided an explanation for why Japanese students' attainment levels are so much better than those of US students when viewed in the light of TIMMS comparative test data. It may also have helped to illuminate more generally why students in Asian countries appear to perform better than students in Western countries, when compared on the basis of both TIMMS and the OECD's PISA data. Indeed Bartalo (2012 pp.9-10) points out that some key points in the OECD 2009 Report "mirror and reinforce" Stigler and

Hiebert's research findings. They are based, he claims, on evidence about teacher practices in countries that ranked at the top of the PISA results and "provide food for thought for American Educators".

- *Teachers are expected to contribute to the knowledge base on effective teaching practices.*
- *Teachers are involved in a collaborative process of lesson development and work together in a disciplined way to improve the quality of the lessons they teach.*
- *Improved instructional practice is institutionalized and often examples of effective teaching are videotaped and used as models for other teachers to learn from.*
- *No teacher's classroom is private, and teachers often observe the practice of colleagues.*
- *Teachers would not think of themselves as professionals if they did not carefully study the most effective methods for increasing student learning.*

Bartalo concludes that the significant differences lay in the cultural factors that shape teaching and the distribution of resources.

'Improving test scores', in the context of international comparisons such as TIMMS and the OECD's PISA programme, appears to be a major motivation for many western countries to follow the US in adopting the lesson study method in their schools, including in the UK (See Dudley et al 2018). The OECD's PISA test results, in which 15-year-old Japanese students have consistently figured as high achievers in Maths, Language and Science, has reinforced the TIMMS results and, with the introduction of the Shanghai education system into the programme, has drawn attention to the existence of a distinctive Chinese lesson study tradition. Policy makers in western countries will perhaps inevitably expect the adoption of the lesson study method to justify itself largely in terms of increased international competitiveness.

Given the fierce international competitiveness, which participation in these international testing programmes induces, one might well ask whether the teachers and schools undertaking lesson study will be able to resist pressure to adapt the method as an instrument for teaching students to improve *performativity* in relation to 'high stakes' tests and exams within their national context. If not, lesson study becomes part of a system for 'managing the

performance' of teachers to secure 'good grades'. In this context adaptations of lesson study will inevitably distort the original method, in ways that contradict the methodological principles Stigler and Hiebert extracted from their comparative video-study. Lesson study will be 'cherry picked' and forged to fit an organizational culture that is driven by test data. What has to be changed, in order to counteract significant methodological distortion in the lesson study process, is an organizational culture of schooling where the 'key scripts' are driven by test data that serve the purpose of comparing student and teacher performance.

In the UK teachers have since 1989 been treated by the state as the implementers of a highly prescriptive national curriculum, in which the learning outcomes of pupils were regularly tested throughout their school careers at various *key stages*. In Oct the Chief Inspector of Schools, Amanda Spielman, publicly announced a significant change of direction for 1919 (see Daily Mail, Oct 12, 2018). School inspections will focus less on exam results and more on 'how children learn?' Too much pressure to produce 'top grades' "had led to some schools 'teaching to the test' rather than offering a 'broad, rich and deep curriculum'". Ms Spielman added that "focusing too narrowly on exam and test results can often leave little time or energy for hard thinking about the curriculum". The new focus she argued will bring "the inspection conversation back to the substance of young people's learning, and treating teacher's as experts in their field, not just data managers." Such impending contextual change in the UK, and perhaps more globally, opens up opportunities to further develop lesson study as an educational improvement science within the broad framework of principle's established by Stigler and Hiebert, and which have been used in this paper to fit lesson study into a broader context of related ideas that are already in circulation in western countries..

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