

www.lessonstudy.co.uk



Lesson Study:

a handbook



Peter Dudley ©



WWW.LESSONSTUDY.CO.UK

This booklet is a guide on how to use Lesson Study to develop and refine teaching, learning and teacher practice knowledge.

The booklet will help you in:

- Getting Lesson Study going in school.
- Planning, teaching and analyzing the research lesson.
- Involving pupils in the process.
- Passing on to others the new practice knowledge you have gained in your Lesson Study.
- Leading Lesson Study.

Lesson Study (LS) is a highly specified form of classroom action research focusing on the development of teacher practice knowledge. It has been in use in Japan since the 1870s. LS therefore pre-dates action research as we know it in the West, by some 70 years.

LS involves groups of teachers collaboratively planning, teaching, observing and analyzing learning and teaching in 'research lessons'. They record their findings. Over a cycle of research lessons they may innovate or refine a pedagogical approach that will improve pupil's learning and which will be shared with others both through public research lessons, and through the publication of a paper outlining their work.

Taking part in collaborative enquiries into improving teaching and learning is the **single most impactful action a school leader can take to improve educational outcomes for pupils.** (Robinson et al 2009)

LS only started to become popular in the west this century, following the success attributed to it by US researchers in developing deep teacher knowledge of both pedagogy and of subject amongst Japanese teachers. This leads to high standards of educational attainment by Japanese pupils when compared with those of comparable groups of pupils in the US (Stigler and Hiebert, 1999; TIMSS, 1999).

In East Asia LS is now in use beyond Japan in countries such as Singapore, Hong Kong, and China. In the West it is in use in countries including the US, the UK, Sweden and Canada.

Lesson Study has been used successfully in this country to improve teaching techniques and pupil progress in core subjects in primary and secondary schools and to develop broader pedagogic approaches such as assessment for learning (AFL). During a Lesson Study cycle a small group of teachers (or even a pair) will:

- Use the data they have gathered from day to day and periodic assessment to agree a focus for the pupil learning and progress.
- Jointly identify a teaching technique to develop or improve which addresses that need (See Fig. 1 Page 6)
- Identify around three 'case pupils'. Each could typify a group of learners in the class.
- Jointly plan a 'research lesson' which both uses develops and closely studies the effects of this new approach – and keeps in mind the three case pupils..

PETER DUDLEY ©

- Teach and jointly observe the research lesson focusing on the case pupils' learning and progress. They may repeat and refine this over several lessons. Not all these need to be jointly conducted research lessons.
- Interview the case pupils to gain their insights into the research lesson.
- Hold post research lesson discussion analyzing how the case pupils responded to the technique, what progress they made, what evidence of learning or of difficulties with learning they displayed and what can be learned about the way the teaching or learning approach is further developed – next time.
- Formally share the outcomes with a wider audience of other teachers – in a presentation, by demonstration or by coaching.

Guidance for each of these stages is unpacked in the sections of this booklet. This draws on what we know about how Lesson Study has worked in schools and colleges in England and overseas.

The final two sections provide ideas on how school leaders can

- a. Create time for Lesson Study and build it into school systems
- b. Use leading practitioners to support and develop the professional learning from Lesson Study and use the Lesson Study model as a platform for in-school coaching



About the author

Pete Dudley introduced Lesson Study (LS) to the UK. He conducted his first Lesson Study in 2001 and later ran the national Lesson Study pilot from 2003-5. This was cross phase and funded by the ESRC Teaching and Learning Research Programme, the National College for School Leadership and CfBT.

Pete is responsible for raising achievement and aspiration in the London Borough of Camden as well as honorary visiting Professor of Education at Leicester University. He has conducted extensive research on LS at the University of Cambridge and promoted professional learning through LS in thousands of schools during his 5 years as Director of the government's Primary National Strategy.

Pete has supported Lesson Study research programmes at the Universities of Leicester, Exeter, Queen's Belfast and Bethlehem, Palestine. He and Jean Lang are now leading a LS development and research programme in the London Borough of Camden with Cambridge University. Pete also advises organisations such as the Teacher Development Trust, the Centre for the Use of Research Evidence in Education (CUREE), and the Education Endowment Funded 'Edge Hill University Lesson Study Program' and Edge Hill's 'Every Child Counts' and 'Every Child a Reader' programmes.

In addition to Palestine, Pete's international work with Lesson Study has been in Singapore, Hong Kong, Chile, Kazakhstan and the US. He is Honorary General Secretary of the World Association of Lesson Studies and is on the editorial board of the International Journal for Lesson and Learning Studies (Emerald).

Acknowledgements

This booklet comprises much original material and also draws upon Crown Copyright material which I wrote for the National Strategies (2008, 2010), the National College for School Leadership (2003, 2005), the Teaching and Learning Research Programme (TLRP) and CfBT.

The research drawn upon in this publication and in those listed above was carried out by the author between 2003 and 2011 at the University of Cambridge with the assistance of a fellowship awarded by the Economic and Social Research Council's Teaching and Learning Research Programme and was runner-up in the 2012 British Research Association (BERA) Doctoral Thesis Awards.

I would like to thank all the teachers, head teachers, local authority staff, academics, policy makers and international colleagues who have enabled and contributed to my knowledge and understanding of Lesson Study and thus to the various iterations of this handbook. Over 60,000 copies have been distributed or downloaded worldwide in 5 languages.

Pete Dudley

Cambridge, 2014

I would like to thank Noemi Peña Traperero for her design work in this edition.

a. Why conduct a Lesson Study

We'll first of all because Lesson Study blends all the features of professional learning that most improve learning and teaching (Cordingley et al., 2004). These are that:

- The professional learning takes place over time – and is not a one-off event
- It happens in real classrooms with real pupils
- It involves an element of collaborative enquiry or experiment between teachers who are trying to solve a problem or improve an approach. Hargreaves uses the term 'joint professional development' - JPD rather than CPD – (Hargreaves 2012).

Lesson Study works because it helps teachers to:

- See pupil learning occurring in much sharper detail than is usually possible.
- See the gaps between what they had assumed was happening when pupils learned and what it is actually happening.
- Find out how to plan learning which is better matched to the pupils' needs as a result.
- Do all this in the context of a supportive teaching and learning community which is strongly committed to helping pupils to learn and to the professional learning of the members of the group (Dudley, P. 2013).
- Change their teaching to better support learning as a result.

Dudley, P (2011) Lesson Study: what it is, how and why it works and who is using it, www.teachingexpertise.com

Lesson Study has refined this blend over its 140 year history. But there is more to it than that and this relates to the ways teachers learn and to the nature of teacher practice knowledge.

Teacher learning and practical knowledge

The simple fact is that successful teachers are largely blind to much – perhaps even to *most* - of what is happening in their classrooms. This is *not* a failing! It is the result of processes that have enabled them to become successful teachers.

I will explain what I mean. Classrooms are amongst the most complex working environments in which any professionals have to operate. The amount of information that is generated by 30 or more learners engaged in lesson activities over the course of an hour or so is vast. So is the speed at which the information comes at a teacher; in fact the Japanese say that 'a lesson is like a swiftly flowing river' (Lewis, 1999).

Researchers have studied how teachers cope with this complexity and speed. Wragg et al., (1996) found that teachers who survive their first three years and become good teachers, do so because every time they discover a new way of managing a teaching situation that has presented a challenge to them, they rapidly internalize the practice knowledge they gain in a form that can be drawn upon unconsciously when it is next needed in the classroom. Practice knowledge in this form is not something a teacher is often conscious of knowing. It is tacit. Like our knowledge of how to ride a bicycle, it only manifests itself when it is needed and it is very difficult to put into words. And it quickly comes back when needed – even after a long time – like riding a bike!

Unlike most animals, human beings have learned to deal with high volumes of information by filtering. For example, we actively pay attention to a tiny proportion of the sounds that we technically 'hear'. We have evolved methods of filtering out extraneous information and paying attention only to what is important or very unexpected. These filtering mechanisms have enabled us to focus on and process what we have identified as important in achieving our goal. In the classroom, we do the same. We focus on the most critically important aspects of what is happening at any one time, filtering out a lot of extraneous events and information. We deal swiftly with new knowledge gained that we have deemed important by storing it immediately in tacit form. All this leaves our conscious working memory freer to deal with the next important things we have prioritized in the complex and swift environment of the lesson.

Unlike surgeons for example whose practice knowledge is recorded in great detail and made accessible to others and this becomes replicable, teacher practice knowledge tends to stay with the teacher who discovered it and who is usually unconscious of its existence. Because teachers tend to practice in isolation as lone professionals with their classes, other teachers seldom get an opportunity to see others' tacit knowledge manifested in action. And when a teacher's practice is observed by another professional it is more likely to be in the context of some form of appraisal or judgement of performance than in a context of professional learning, and in such contexts teachers tend to play safe with the practices they put on view.

Lesson Study helps experienced as well as inexperienced teachers to learn. Because, through its processes of joint planning, joint observation and joint analysis, we have collectively to imagine learning. So, we get to see aspects of pupil learning through the eyes of others as well as through our own, and we compare actual learning observed in the research lesson with the learning we imagined when we planned it. This forces us to become conscious of things we would normally not be conscious of either because we would filter it out or because it would be dealt with through our tacit knowledge system.

In the UK we nearly always use 'case pupils' in lesson studies. Many have said that focusing on and thus becoming more aware of the learning needs and behaviours of individual 'case pupils' somehow makes them more aware of the individuality of all their pupils. So instead of teaching to a 'middle' with groups of high and lower achieving pupils on either side, Lesson Study helps teachers to be more aware of the needs of individuals in their subsequent teaching, but seemingly without being overwhelmed by the experience. In fact they will say 'I realised for the first time that she learns in a very different way to how I thought, and I realise there are three others like her in my class'. Lesson Study can therefore be very useful for finding out about and improving the learning of children who are underperforming, who have specific needs or who are from groups of learners who typically underachieve such as children from deprived households or looked after children. It gives them forensic visibility which is needed if teachers are to monitor their learning and progress and ensure they succeed.

Why "case pupils" are important

My research (Dudley 2013) indicates that this may be as a result of the fact that the reflexive, recursive and collaborative experience of Lesson Study helps the experienced teacher, who successfully utilised her ability to filter our classroom information, to select some of these filters and to switch them off. This allows, in a controlled way, aspects of classroom information that relate to pupil learning, to become visible that would otherwise have been filtered out. Lesson Study seems to help teachers to learn how to switch these filters off when all their prior experience has taught them that success lies in switching them on.

One phenomenon I have seen repeatedly both in my research findings and during lesson studies is that a Lesson Study group will discover that one of their three 'case pupils' is discovered to be operating at a very different level from that which the group had thought. Pupils in low attaining groups are discovered to be operating at, or even above, the levels of middle attaining groups. In some cases a pupil has been placed in low attaining group (actual groups or groups that exists in their teachers' minds) for years. Low pitch, low expectations and low challenge are the death knell for pupil progress, motivation, learning, and achievement and this happens when learning does not challenge pupils – or challenges them far too much.

On the plus side – at least Lesson Study brings this to light and Lesson Study helps these children to make better progress with their learning needs better understood from that point on in their school lines.

What is the evidence of impact of Lesson Study on pupil attainment?

Evidence from the use of Lesson Study by hundreds of leading teachers working with 'coasting schools' who used Lesson Study as a coaching approach to improve pupil progress in writing and mathematics at age 11 showed considerable impact year on year (Dudley, 2012). Evidence was also found in the independent evaluation of this National Strategy Program (Hadfield et al., 2011).

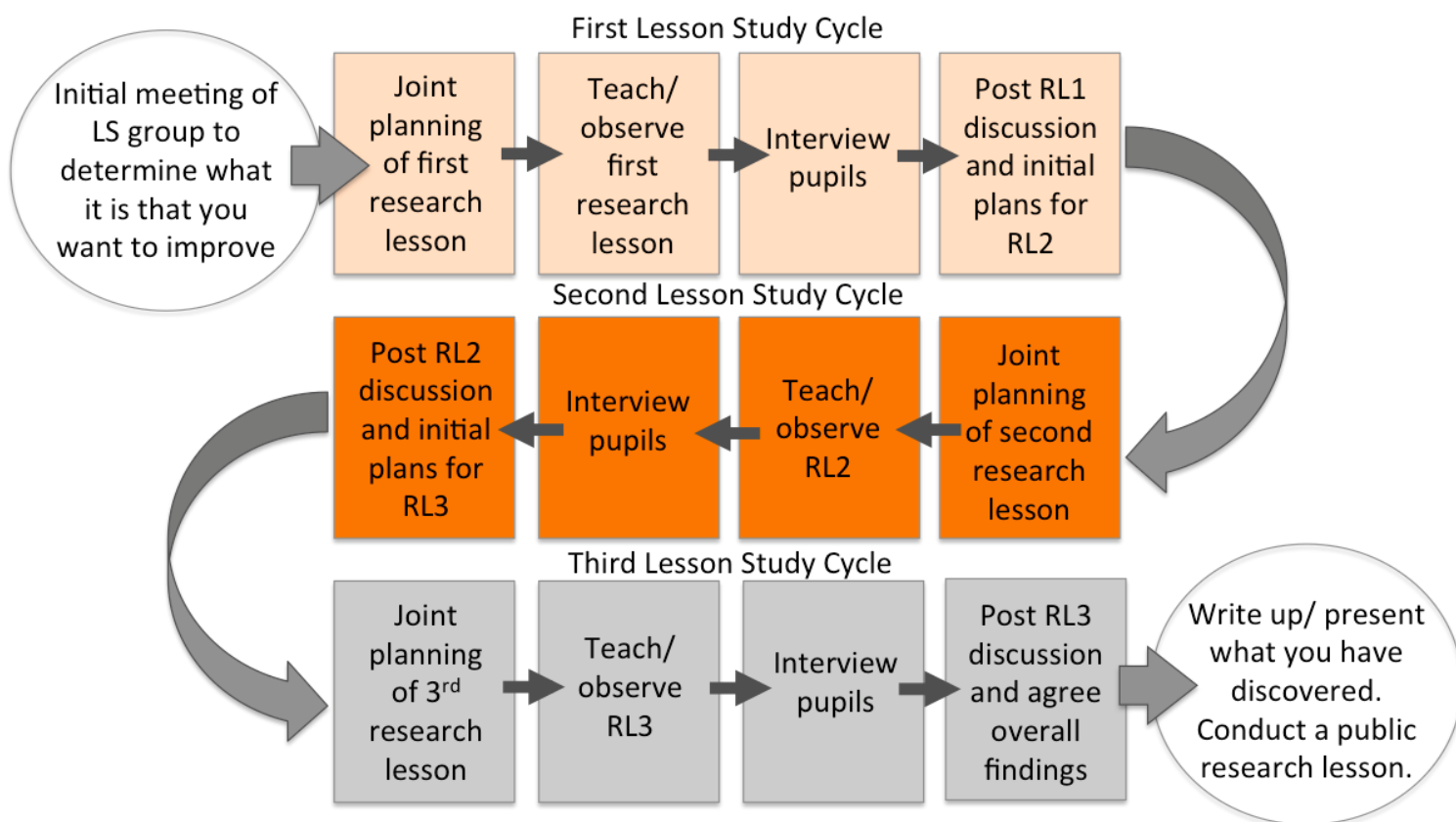
A large scale study under review at the time of writing in the US, suggests LS has a significant impact on pupil learning as a result of teacher learning. My own pilot project demonstrated a positive impact on pupil learning and this was directly linked with related teacher learning in a later study (Dudley, 2013).

b. Getting Lesson Study Going

A Lesson Study consists of a cycle of at least three 'research lessons' that are jointly planned, taught/observed and analyzed by a Lesson Study group. (See Fig. 1 below).

'It enabled me to see things in my classroom differently'

Fig. 1 The Lesson Study process



Lesson Study (LS) Group Protocol

This protocol exists to help create common expectations amongst the LS group members. In doing this it will help the group to form a good working relationship that helps members to share ideas, concerns, challenges and 'wonderings' without fear of criticism. All this will aid the sharing and discovery of new practice knowledge.

At all stages in this Lesson Study we will act according to the following:

- All members of the LS group are equal as learners whatever their age, experience, expertise or seniority in school (or beyond)
- All contributions are treated with unconditional positive regard. This does not mean they will not be subject to analysis, doubt or challenge, it means no one will be made to feel foolish for venturing a suggestion. It is often suggestions that make you feel foolish or vulnerable that are of the greatest value and generate the most learning
- We will support whoever teaches the research lesson(s) and make faithful observations, recording as much as possible what pupils say as well as do
- We will use common tools for Lesson Study – planners, pupil interview prompts and approaches to sharing outcomes with each other
- We will use pupils' work and interview comments to inform the post lesson discussion alongside our observations
- We will use the post lesson discussion flow (see page 14), starting by discussing what each case pupil did compared with what we predicted and let the discussion flow from there (See page 13)
- We will listen to each other and to ourselves when we speak and build on the discussion, making suggestions, raising hypotheses, elaborating, qualifying and at all times being accountable to our lesson aims, our case pupils and our observation and other research lesson data.
- We will share what we learn – our new practice knowledge - with our colleagues as accurately and vividly as we can and in such a way that they can benefit from and try it out themselves
- We will share the aims and outcomes of our Lesson Study with our pupils appropriately, depending on their ages and stages of development. Their views, ideas and perspectives will be treated with equal positive regard.

Signed and dated by LS group members.

c & d Planning the first Research lesson and identifying the ‘case pupils’

‘Focusing down on the case pupils has enabled a number of really important things to be revealed’

What has worked well

Agree which class you will conduct the first research lesson in and then identify three pupils who might (a) typify different groups of learner in the class – pupils who are making good, average or below average progress either in a cross curricular skill such as academic writing, or in a subject specific aspect of learning or (b) pupils who are not learning or engaging as well you would have hoped.

Agree the level each pupil is operating at in the focus area of the research lesson.

Review and modify your teaching materials carefully as you plan – *kyozaikenkyu* in Japanese.

Write out in full *exactly* what you want each pupil to be able to do with their new knowledge by the end of the research lesson. (You can use the planner on page 10).

Plan each stage of the lesson with particular attention to the sequence where you use the teaching technique you are refining or planning. Note down what you hope the response of each case pupil will be. What will each pupil will do at this point to evidence their progress?

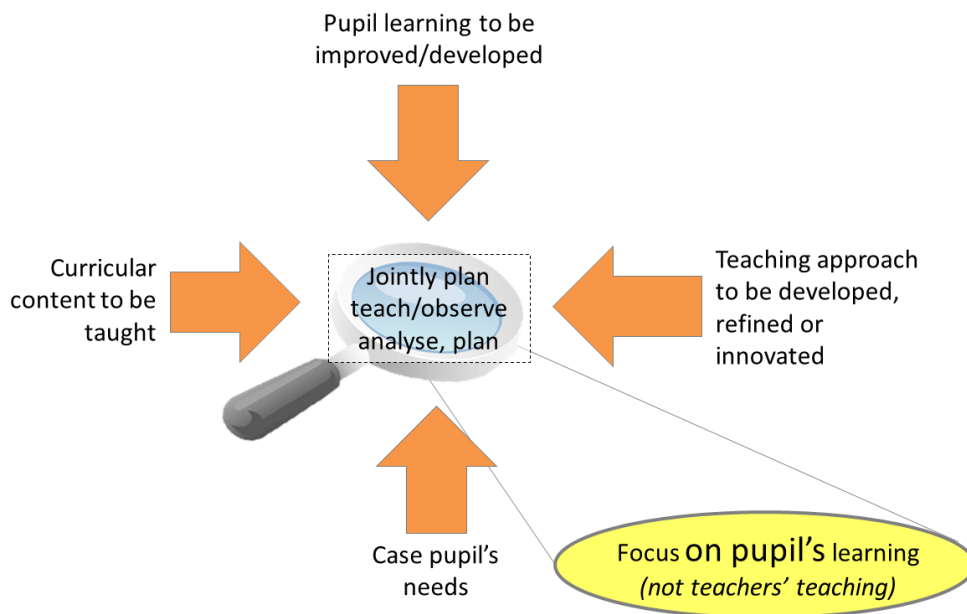
Identify as carefully as you can: what resources will be used and how, what you will write on the board, where and when and indicate timings for the lesson stages.

Agree who will focus their observations on which case pupil(s). It helps to have some rules to ensure you don’t all gather data about two pupils and miss the third. Have a reserve case pupil in case one is absent on the day of the research lesson.

A Lesson Study planner is provided on page 11. It should be enlarged to A3 for use. Each Lesson Study group member should have a copy at the start of the lesson because it also serves as an observation annotation sheet and the basis for the post lesson discussion.

Notes

Figure 2. Creating the balanced focus on pupil learning in a research lesson.



You can use Figure 3 below to record developing of your case pupils.

Figure 3. Case Pupil Information panel.

Case pupil A: Name

Success criterion for this focus:
 By the end of the sequence Pupil A will (describe what they will do to demonstrate progress in the identified learning goal in the lesson)

Additional notes:

Research lesson planning, observation and discussion sheet Subject, _____ Learning Focus _____ Teacher/observer _____							
Precisely what is this research lesson aiming to teach? (it may be a section of a longer teaching sequence) <i>By the end of this lesson pupils will be able to and we will know this when ...</i>							
What learning or teaching technique is the research lesson aiming to develop? <i>We are hoping to improve...</i>							
Current attainment and success criteria Describe what you are looking for from them by end of lesson in the identified aspect	Case pupil A Success criterion for this focus		Case pupil B Success criterion for this focus		Case pupil C Success criterion for this focus		
	Stage of lesson sequence	How you predict case pupil(s) A will respond	<i>How they are observed to respond</i>	How you predict case pupil(s) B will respond	<i>How they are observed to respond</i>	How you predict case pupil(s) C will respond	<i>How they are observed to respond</i>
Stage ... (approximate time)							
Stage ... (approximate time)							
Final stage ... (approximate time)							
What were they able to do? (What progress have they made and how do you know?)							
Initial thoughts							

g. The post research lesson discussion

'...it's amazing how much you learn by explicating your ideas, so in challenging me, I have to justify why I think we should do this in this particular way and through that it really strengthens your own knowledge and gets you to a place you could not get on your own'

What works

Come together as soon as you can after the Research Lesson (and certainly not later than 24 hours afterwards). You may wish to review the following qualities of a successful post Research Lesson discussion.

- (a) Openness to critical viewpoints and suggestions
- (b) Fidelity to observed data and no excusing failure
- (c) Viewing the post lesson discussion as a joint learning opportunity
- (d) Clear goals and questions from the plan/observation sheet
- (e) A designated 'moderator' for the discussion (a chair who can lead the discussion positively,) a role that can be combined with that of
- (f) 'Adviser,' (final commentator) whose role it is to capture the learning distilled from the discussion, in order that it can be acted upon by the group and others beyond the group. This person may be external to the school (Takahashi, 2005).

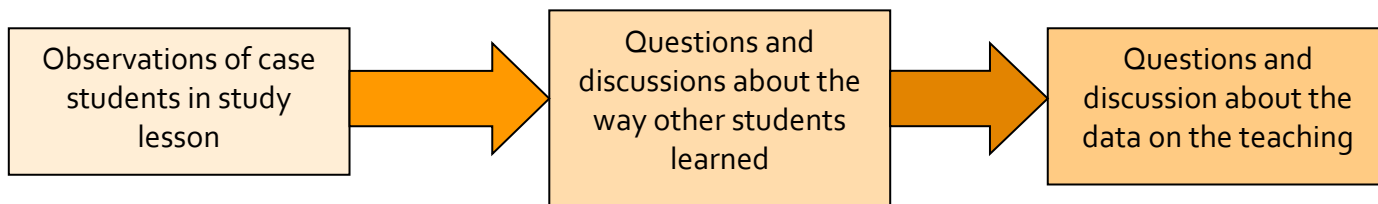
The most important thing to remember though is that the flow of analysis needs to start with the observations made of the case pupils' (and other pupils') learning before it addresses the teaching (See Fig 3 below). This preserves the focus on pupil learning and only on teacher learning that arises from this and reduces the tendency for lesson observation discussions to become feedback on teaching (which teachers can feel is judgmental in nature and not conducive to teacher learning (See Fig 3 overleaf).

Sign and date the record.

Keep the notes in a professional learning log in the staffroom.

Notes

Figure 5. Post Research Lesson Discussion Flow



(Dudley, P., 2012)

The exemplar record below can be used to capture the post lesson discussion:

Post Lesson Discussion record			
	Case pupil A	Case pupil B	Case pupil C
What progress did each pupil make? Was this enough?			
What about others in the group of learners they typify?			
How did the technique being developed help or hinder? (Maybe a bit of both)			
What surprises were there?			

What aspect(s) of the teaching technique could be adjusted next time to improve the progress of each	<ul style="list-style-type: none"> • • •
So what should we try next time?	<ul style="list-style-type: none"> • • •

Initials

Date

Overall assessment record of progress in a Lesson Study

The form below can be used to summarise the progress case pupils and other pupils make across the three lesson studies in relation to the success criteria you had agreed for them in each of the three research lessons.

Total number of pupils in class

Pupil(s) Total number of pupils in the class	Met success criteria	Exceeded success criteria	Fell short of success criteria
RL1			
Case pupil A			
Case pupil B			
Case pupil C			
Number in class who we expected to have..			
Number in class who actually..			
RL2			
Case pupil A			
Case pupil B			
Case pupil C			
Number in class who we expected to have..			
Number in class who actually..			
RL3			
Case pupil A			
Case pupil B			
Case pupil C			
Number in class who we expected to have..			
Number in class who actually..			

i. School leadership: championing Lesson Study and building it into school systems

'...what I've been surprised and really pleased about I think is that people who normally close the door and get on with what they do in a lesson, have suddenly thought 'Oh hang on, this is good for me, within my lesson. It's good for the kids within my lesson, it's practical, I'm doing something. And they've really got on board. And that's been remarkable in our place.'

What works

Lesson Study is very good value for money if you genuinely create opportunities for its outcomes to feed into the practices of those involved in the study and others in the school.

Some heads allocate dedicated professional learning time when Lesson Study groups plan and analyse their lessons, which is created from time normally allocated to professional development or management processes.

Judicious use of PPA time, specialist teaching time, staggered timetables or break times and any other means which allow some teachers to be free to talk together, can create opportunities for planning or for post lesson discussions which do not always demand supply cover.

Myths about the cost of Lesson Study

Lesson Study is not expensive. Figure 4 below shows the bottom line demands on classroom cover of a 3 x research lesson (RL) Lesson Study such as that outlined in Figure 1 (P. 5).

Table 1. Classroom cover demands of one Lesson Study X = Classroom cover required	T1	T2	T3
Initial planning meeting			
Planning RL 1.			
Teaching RL 1.		X	X
RL1 post lesson discussion and planning RL2			
Teaching RL2		X	X
RL2 post lesson discussion and planning RL3			
Teaching RL3.		X	X
RL3 post lesson discussion			
Creating poster or report of Lesson Study			
Sharing knowledge with others			

Notes

Sharing the practice knowledge you develop in a Lesson Study

Some Lesson Study groups demonstrate the techniques they develop to other teachers in an open house research lesson. Here the lesson is taught with a number of invited observers. A lively discussion follow including pupils as well as adults. This is popular in Japan. Where a Lesson Study unearths some very important practice knowledge a school may open the event up to invited guests from other schools, universities or local authorities and teach it in the school hall after school in a 'public research lesson'.

In the UK the most common practice is for teachers to share their lesson studies with their colleagues in the form of a presentation which may contain snippets of videos from the research lessons or of pupils describing the impact on their learning. Some schools are now developing the use of posters to record and present their lesson studies.

Notes

j. Using LS coaches to support and develop the professional learning from Lesson Study and using the Lesson Study model as a platform for cross-departmental or school to school coaching

What works

Leading practitioners or consultants can support the Lesson Study process. They can:

- Demonstrate a technique in the school immediately to other teachers prior to a Lesson Study cycle beginning.
- Join a Lesson Study group as they plan a research lesson and contribute ideas and suggestions.
- Sit with a Lesson Study group and discuss the research lesson they have prepared – contributing to suggestions about how the pedagogic technique could be developed.
- Join a research lesson as an observer (with equal status) and participate in the post lesson pupil interview and discussion.

'Knowledgeable others' as they are called in Japan play an important role in facilitating lesson studies in this way and cross-fertilizing ideas and developments from school to school.

Subject leaders can play a similar role – especially if they have participated in a Lesson Study cycle themselves and become a champion in school.

Notes

Notes

In England there is growing interest, particularly from Teaching Schools and other collaborative school groups in using Lesson Study for sharing and developing improvements in learning across and between schools.

Additional interest and value can be created around Lesson Study if it is used by teachers to develop a portfolio to evidence particular teaching standards or to contribute towards professional or academic qualifications, research or other forms of professional recognition.

When your teachers have developed some practice which has had a clear impact on learning and progress of pupils and which you think others would be interested in – log the practice as a case-led study at:

www.lessonstudy.co.uk

This is a website designed to help practitioners search for and share practice in classrooms and school improvement which have worked in one place and could work elsewhere.

The global spread of Lesson Study

During the time this booklet has been in circulation Lesson Study has moved from its home in Japan to the Hong Kong, Singapore, and China, and across East Asia and to the US, Australasia and Europe where it is most widely practiced in the UK and Sweden.

Lesson Study has been adopted as the default method of teacher learning by national programmes such as Every Child Counts and Every Child a Reader. The Government is currently funding three large development and research Lesson Study programmes.

So, share your lesson studies and see those of others at:



For more information about UK LS developments join:

www.lessonstudy.co.uk



For information about Lesson Study around the world join the World Association of Lesson Studies (WALS) at:

www.walsnet.org



For research papers and lesson studies published internationally go to:

<http://www.emeraldinsight.com/products/journals/journals.htm?id=ijlls>

References

- Cordingley, P., Bell, M., Rundell, B., Evans, D., & Curtis, A. (2004). *How do collaborative and sustained CPD and sustained but not collaborative CPD affect teaching and learning?* London: EPPI-Centre, Institute of Education.
- Department for Children, Schools and Families. (2008). *Improving practice and progression through Lesson Study: a handbook for headteachers, leading teachers and subject leaders*. London: DCSF.
- Dudley, P. (2008). Lesson Study in England: from school networks to national policy. Presented at the World Association of Lesson Studies Annual Conference, Hong Kong Institute of Education.
- Dudley, P. (2011) Lesson Study: what it is, how and why it works and who is using it, www.teachingexpertise.com
- Dudley, P. (2012) Lesson Study in England: from school networks to national policy, *International Journal of Lesson and Learning Studies*, 1.1 pp 85-100
- Dudley, P. (2013) *Teacher Learning in Lesson Study: what interaction-level discourse analysis revealed about how teachers utilised imagination, tacit knowledge of teaching and freshly gathered evidence of pupils learning, to develop their practice knowledge and so enhance their pupils' learning*, *Teacher and Teacher Education, Teaching and Teacher Education* 34 (2013) 107e121
- Hadfield, M., Jopling, M., and Emira, M. (2011) An evaluation of the National Strategies Primary Leading Teacher programme. London, Department for Education.
- Hargreaves, D. H., (2012) A self improving school system: towards maturity, Nottingham, NCSL
- Pedder, D. and Opfer, D., (2012) Professional learning orientations: patterns of dissonance and alignment between teachers' values and practices, *Research Papers in Education*, London, Routledge pp 1-32
- Norwich, B., Dudley, P. and Ylonen, A (Forthcoming) What Lesson Study can contribute to the classroom based formative assessment of pupils' learning difficulties.
- Robinson, V., Hohepa, M., & Lloyd, C. (2009). *School leadership and student outcomes: identifying what works and why best evidence synthesis*. Auckland: New Zealand Ministry of Education.
- Takahashi, A. (2005). An essential component of Lesson Study: post-lesson discussion. Presented at the The Northwest Regional Educational Laboratory's Lesson Study Symposium, Olympia, Washington: DePaul University, Chicago.
- Trends in International Mathematics and Science Study. (1999). TIMSS 1999 assessment results. Retrieved June 4, 2010, from <http://nces.ed.gov/timss/>
- Wragg, E.C., Wikely, F., Wragg, E., & Haynes, G. (1996). *Teacher appraisal observed*. London: Routledge.

