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**Teachers and Teacher
Educators Learning
Through Inquiry:
International Perspectives**

Edited by:
Pete Boyd & Agnieszka Szplit

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*This book is dedicated to the memory
of our friend and colleague
Professor Carey Philpott*

Teachers and Teacher Educators Learning Through Inquiry:
International Perspectives

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Lesson Study: an Opportunity for Collaborative Teacher Inquiry

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Abstract

Lesson Study is a form of teacher inquiry which relies on collaboration and focuses teachers' attention to specific pupils that they are currently teaching. It uses a cumulative and cyclical plan, do, review structure and draws teachers into conversations through which they consider plans for teaching, develop hypotheses about pupil learning and engagement, participate in inquiry-based lesson observations and experience meaningful reflection and evaluation. In this chapter the characteristic features and qualities of Lesson Study are outlined. Two case studies are shared, one from a primary school and one a secondary school. Evidence from the Lesson Study groups illustrates the significance of the focus on case pupils, and reinforces how engagement in Lesson Study can actively change professional learning cultures. We hope to demonstrate that it is a means through which individual professional learning and whole school development might come together by paying close attention to the mechanisms through which teaching practices and teacher learning can realistically be developed. We conclude with a consideration of the advantages of Lesson Study in supporting teacher inquiry, but also caveats about its possible limitations.

Key words

Lesson Study, Practice Development, Collaboration

Introduction

Almost all forms of inquiry rest on the practical elements of 'plan, do and review', and any teacher's working day has these components woven in. Teachers plan and resource lessons; they teach and they review the learning which their

students demonstrate. On good days these activities form a restless cycle, with teachers making sense of the progress and attainment of students to inform their planning, and being able to adapt their teaching as they review the dynamics and patterns of learning that emerge during and after lessons. Teaching and learning are not streamlined activities, and they do not exist in clinical environments. Some lessons go to plan, others do not. Some learners engage and learn in ways that are relatively predictable, but only on some days. Nothing is straightforward and teaching and learning can only really be understood as complex challenges. When teacher inquiry works well it is because it acknowledges and unpacks this complexity, addressing the realities of the classroom, the needs and expectations of the student cohort and the skills and knowledge of the teacher. Each aspect is a unique contributor to the ecology of learning. Productive teacher inquiry also allows for uncertainty, curiosity and confidence which all fluctuate; it allows for the creation of tentative propositions and deliberate plans, and it provides tools for understanding impact. Teacher inquiry is possible as a solitary activity, undertaken as a form of professional development and scholarship, but professional collaboration can add momentum and enhance its efficacy.

In this chapter we consider how Lesson Study can afford teachers this opportunity for collaborative inquiry. We first provide an outline of Lesson Study as teacher inquiry, we then offer illustrative insights and evidence of its practice from two settings. The first example is a secondary school, and in this we focus on how the model allowed a triad of teachers to focus their pedagogical thinking on a small group of shared pupils for whom collaborative learning in class seemed to present a significant challenge. The second example is from a primary school, and here our focus is on how Lesson Study was developed as part of a deliberate whole school change process designed to shift teachers' experiences from being accountable to senior leaders to embracing greater shared professional responsibility. Finally, we consider Lesson Study as a theorized practice, as a means to draw critical conclusions about its potential for teacher learning and development.

Understanding Lesson Study

In their report 'What Makes Great Teaching?' Coe et al., (2014) offer Lesson Study as an example of a school-based support system for which there is some evidence of positive impact on student progress. They classify it as such because it provides teachers with a chance to 'respond positively to the challenge of improving their effectiveness' (p.48). While Lesson Study has its roots in Japan and originated over a century ago, it is becoming a fashionable form of Continuing

Professional Development (CPD) in the UK, Europe and parts of the US. This growth has been demonstrated by the creation of 'Lesson Study UK' (Dudley, 2014), a professional learning network dedicated to its use and development. Although, like all educational practices, Lesson Study is subject to adaptation, in its ideal form the following are critical elements:

- Teachers work collaboratively in small groups (threes are common);
- They pool their knowledge around the chosen aspect of practice and jointly plan lessons which one of them then teaches as a 'research lesson';
- The collaborating teachers observe the lesson as a form of inquiry, analyzing learning and typically focusing on 'case students' who are often discuss their learning with the observers following the lesson;
- The group jointly review the lesson, with a focus on the learning and how the teacher supported it;
- This cycle is repeated by turn-taking the roles, with cycles being linked as teachers learn from one to the next, often teaching amended versions of the same lesson;
- Additional expertise is offered by an external agent (not part of the teacher group) who acts as a critical friend with relevant expert knowledge.

These elements can combine to enable lesson study to function as a means of collaborative teacher inquiry. They rest on the foundations of 'plan, do, review', but add particular emphasis to this as a shared experience of exploring and developing practices, with the scrutiny being at the level of individual student's participation in and outcomes of learning. While Coe et al. (2014) focused on improving teacher effectiveness in its advocacy of Lesson Study, it should not be seen as simply a means to an end, but as having the potential to transform individual teacher's knowledge and practices, and to alter the learning environments and cultures of schools.

Lesson Study in action: case study 1, *George Stephenson High School*

The starting point:

Stefan McElwee, was working as a senior leader at George Stephenson High School, a Teaching School in Killingworth in the North-East of England when he introduced a small-scale Lesson Study pilot at the school. He was also studying at Newcastle University where he was completing the 'Improving Coaching and Mentoring for Teacher Development' module, during which Lesson Study

is introduced to students as a potential vehicle through which co-coaching practices might be employed. Stefan drew inspiration from Robinson et al. (2009) who identify that school leaders being actively involved in professional learning has a positive effect size on improving student outcomes due to their ability to develop a 'deeper appreciation of the conditions required to achieve and sustain improvements in student learning' (p.42). He was hopeful that his personal engagement in study would give him a more informed edge when it came to talking with teachers about how they might make changes to practice.

The remainder of this case study is written by Stef, and also quotes teachers participating in the pilot.

Planning for collaborative professional development

Based on the thinking I had undertaken in my Masters level studies I was developing a clearer insight into how to achieve some of my ambitions as a senior leader. I wished to establish further mechanisms that emphasised and stimulated ongoing teacher learning which were situated in our own work place. We as a school had had great success in stimulating professional learning through action research models but much of this learning was individual and offered limited potential for peer support. The next logical step for the school was to plan a more collaborative model of teacher learning. I wanted to instigate a model of learning that allowed colleagues to work together on rich discussion and evaluation of practice within their own classroom environment. Lesson study appeared ideal for this purpose. We aimed for it to become a platform for workplace learning, creating a process where learning is continual, something which grows and evolves through interaction as teachers reflect on and evaluate their practice together.

A strong argument for the development of Lesson Study at the school was a prior foundation we had of action research. I consider that Lesson Study is a highly specific form of action research focusing on the development of teacher practice knowledge. The concept of 'research lessons' (Dudley, 2014), was particularly attractive as a stimulus for inquiry and pedagogical refinement which I see as crucial to improving teacher learning. Lesson study acts as an epistemic tool (Lofthouse & Hall, 2014) as it can be seen to be an efficient scaffold to enable teachers to get together in a zone of proximal development. My hope was that, if we worked across subject contexts, the teachers engaged in lesson study would offer each other new perspectives and in particular support the development of hypotheses regarding the learning behaviours of the case pupils. This structure

for teacher conversation was very different to those traditionally exploited in our school.

The selection of colleagues for the pilot was based on three key factors; that they were informed volunteers, that they taught classes with shared case pupils, and that they would allow me to be involved in the process as a teacher learner. This involvement felt critical to me as a school leader. I wanted to create a teacher learning model which avoided a “troubled identity” (Lofthouse & Leat, 2013) caught between empowerment and managerialism. I wanted an authentic involvement in order to authenticate a space in which we, as colleagues, determined the direction of our professional learning.

Developing practice

As we developed our approach we gave ourselves time to discuss our aims and expectations of Lesson Study. We discussed the climate in which our learning conversations would hopefully thrive and flourish and I noted the importance of creating a support group for one another in improving practice. Some of the key identifiable aspects of the group protocol were:

- The three members of the study group were equal as learners irrespective of standing, experience or expertise
- All contributions were to be viewed with positive regard, no one would be made to feel foolish for venturing any suggestions or challenges within learning conversations
- Each teacher would welcome the observers as reflective, non-judgemental observers
- Comments and feedback would focus on pupil learning outcomes and behaviours in relation to teacher interventions
- We would share what we learned with each other within one week of each aspect of the cycle to ensure our reflections were appropriate and relevant to experience.

These shared protocols allowed us to co-construct a common goal through the sharing of knowledge and collaborative inquiry into specific problems linked to pupil characteristics in our selected teaching group. We were aiming for positive and trusting relationships to create conditions supporting engagement, action, reflection and sense-making (McArdle & Coutts, 2010). In this setting we saw our identities emerging as teacher researchers, and I sensed a propensity for rapid development of learning based on the strength of this identity.

Co-constructing meaning and action by focusing on case pupils

Focusing on the needs of individual case pupils generated engagement in a conversation involving critical and reflective discussion about teaching and the needs of our learners. We developed a shared understanding that one of the major barriers to learning in our selected teaching group was negative group dynamics during collaborative learning, leading us to agree to focus on this area. Our Lesson Study conversations led us to agree shared action to change our pedagogy which then acted as a stimulus for inquiry. It generated a common goal or specific problem to be solved, which was articulated as follows,

How could we change the collaborative dynamic of group work in our focus group in order to improve learning outcomes of the pupils within?

In our initial discussion we constructed a shared understanding of what learning outcomes would look like for the case pupils within our selected group. We began to differentiate pupils according to their engagement during collaborative learning activity, and how we might create opportunities within each of our classrooms to better support the learning needs of these individual pupils. We also drew explicitly on school-based teaching and learning development work related to collaborative learning, including project-based learning and SOLEs (Self-Organised Learning Environments). These initiatives have been supported by The Research Centre for Learning and Teaching (CfLat) and SOLECentral at Newcastle University. Our focus on specific pupil needs and engagement with external and school-based expertise allowed us to engage in more focused lesson planning. We also hypothesised about how we expected each of the case pupils to behave and learn. We really valued this as we felt it provided a crucial scaffold to allow an assessment of both the effectiveness of the strategy and the impact on pupil behaviour and learning. Developing these hypotheses generated coaching conversations which were had a strong sense of co-inquiry, as explained by the teachers;

Teacher discussions became more focused upon the individual students rather than content of the lesson, it was more of an inquisitive nature; what would happen if? How should we approach that? This stimulated conversation and discussion, I felt it was easier to take risks in the approach to the lesson.

[We were] planning for the group dynamics, looking at students and discussing them in more depth than any data can. I feel as though I really know the students in the class now as before I just taught them for 50 minutes a week. I think planning different strategies to use in the classroom was beneficial, especially for me as I would never usually attempt group work so I was completely out of my comfort zone.

The next stage of the cycle was to conduct observations of the first research lesson. We decided to inform the class at this stage that we were conducting a lesson study to examine how pupils learn in collaborative environments. Although we wanted to act ethically we did not outline at the start of the first lesson that we were observing individual “case pupils”. As we observed each others’ lessons we followed the design in the lesson study UK handbook (Dudley, 2014) and wrote out exactly what each of the case students was able to do in relation to the activities that were planned for them. Our focus on case pupils was shared with them after the first lesson when they were interviewed about their experiences. We were clear at this stage to explain why we were interested in them. It was important that pupils understood they were being observed for reasons leading to potential pedagogical developments as opposed to any negative aspects of their own learning behaviours.

Within a week of the observed lessons and pupil interviews we held our post research lesson discussion, and in each one the observing teachers acted as a moderator to the discussion. The conversations began with discussion about the outcomes of the case pupils, and this preserved the focus on pupil learning rather than on teacher performance. This took on a distinctive quality, as described by one of the teachers;

The collaborative inquiry process enabled me to engage in more direct conversations regarding students and how they learn and what environments are effective in promoting learning and progress. Working so closely with colleagues to review the learning in my subject and their respective subjects was initially challenging but very rewarding. Observing students in a different environment was beneficial too and very effective in developing my pedagogical approaches.

It cannot be overstated how useful we found it to share case pupils, and although we recognise that this might not always be possible, we would encourage secondary schools to consider this model. It allowed us to collectively plan interventions and evaluate their success or otherwise based on these case pupils, and as one teacher indicated;

The case pupils were important as they provided focus for our investigations. Some of their problems were easier to solve than others. I am pleased one of the pupils has become a challenge for us as it has challenged our group in terms of our approach for this student and the collaborative nature of the research really supports this. I was very interested to see if our next approaches worked or failed as I really wanted to know more about this student and how we could best help her achieve.

The creation of co-constructed professional learning opportunity might be seen as one of the main achievements of the lesson study cycle. In undertaking a review of the pilot for my Masters module I recorded and analysed our discussions. It was important to me that I learned *about* the learning that was generated by the process, and what the conversational characteristics were. The benefit of clear goals and questions posed in the planning session supported more structured conversations and acted as a stimulus for pedagogical change. Nothing about the process suffered from simple description of the lesson environment. Instead, because of inquiry based conversations leading to probing questions based on data, our conversations were explicitly linked to evaluative discussions focused on predicted outcomes and pupil behaviours. This in turn generated pedagogical change. Our teaching practice and repertoire definitely changed in response to evaluations of what had gone before, as highlighted by one teacher;

The opportunity to examine the performance and learning of individual students across a range of subjects and situations and compare their progress in these areas to the progress they make in my subject was impacting on my own teaching.

This feedback is powerful, lending weight to my belief that Lesson Study has potential for professional learning. Ideas were becoming concrete and tested out in a supportive environment. Teaching was being developed a result of teachers working together to re-consider how individual pupils can be helped to make progress.

Lesson study as an alternative professional learning experience

The focus on pupils rather than on teaching *per se* allowed structural changes to our typical experiences of lesson observations and review and became a significant enabler for effective professional conversation. We treated all views as hypotheses, testing their validity through deep inquiry and developing integrative solutions (Timperley, 2015). As such I felt that our pilot lesson study approach offered genuine opportunities for teacher co-coaching. Timperley highlights key enablers for effective professional conversations. It is worth commenting on how I view our own process to have met, or been supported by these enablers. Relationships were integral to the success of the lesson study. Our school culture is one of improvement-focus, where conversations create professional agency needed to make progress towards outcomes. Our lesson study cycle was further evidence of such cultural embrace. Our professional and personal relationships developed over the time of the study and created a 'culture of confidence' in

which trusted and supported conversations led to reflective pedagogical change. By working corroboratively to develop the piloted lesson study approach we were all clear on and committed to applying shared professional learning objectives. New knowledge was generated via our conversations leading to developments in pedagogy.

Lesson Study in action: case study 2, Rickleton Primary School

The starting point

Colin Lofthouse is the Headteacher at Rickleton Primary School in Washington in the North-East of England. He also supports other head teachers in development work and his school is part of the Tyne Valley Teaching School Alliance. After a year and a half in post, and as a result of both internal and external evaluations, he felt secure in stating that learning in the school was 'good, but not good enough'. As he had got to know his teachers Colin recognised that they wanted to become more self-determining about their own teaching styles, but they were not confident enough to be so. Although they had hunches about what would work better they seemed to lack a shared professional language to discuss teaching and learning. He was keen that staff did more than just change their teaching approaches, wanting to offer them the chance to develop greater critical analysis of, and reflection on, teaching outcomes. The senior leadership team in school believed that the historic model in the school of lesson observations followed by judgement and feedback had promoted a focus on teacher 'performance' rather than on how learners were learning. This coupled with a heavy-handed performance management focus had made teachers fearful of lesson observation and unable to experiment and develop different pedagogy.

Colin was aware that this would not change without an interruption to the normal routines of teaching, monitoring and CPD. To achieve this interruption he chose Lesson Study as the vehicle for change, which he hoped would give teachers permission and the right 'space' in which to rethink teaching and learning. To establish the new space and practices required the senior leaders adopted what seemed at the time a radical change by removing all formal lesson observation from the school's monitoring programme. This was seen as crucial in establishing a culture of experimentation where performance management did not impinge negatively on the development of teaching. In return, staff were asked to engage with new a CPD programme based around the development of assessment for learning using a Lesson Study model. Colin then commissioned

Claire King, an educational consultant, to work with the school over a year to first develop a CPD package around effective questioning and then to work with two lead teachers to introduce lesson study as a model for a collaborative practitioner inquiry network.

The remainder of this case study is written by Colin and Claire who reflect on how the introduction of lesson study was achieved and what its outcomes were in the first year, and includes direct quotes from teachers participating in lesson study.

Establishing the practice

The Lesson Study process was initiated through CPD events about ‘questioning’ which each contained research-based information about best practice and included resources and tools to support teachers in carrying out small teacher designed inquiry tasks in their own classrooms. An important aspect of the training was promoting the use of research as part of an effective learning environment. The training was extremely well received, inspired some experimentation within the classroom and to a large extent ignited a new found interest and passion in thinking about pedagogy. We knew however, that much more was required if practice was to change in any meaningful and sustainable way. We needed a significant shift towards making staff responsible rather than accountable. The training was a good starting point but what was really needed to develop a learning culture was the facilitation of reflection, thoughtful discussion and shared problem solving. We hoped that using the CPD as platform for Lesson Study would support the development of skilled active listening habits, a shared language for talking and thinking collaboratively about pedagogy and a way to shift a range of deeply ingrained habits and behaviours which were holding some members of staff back in terms of developing their practice. While wishing to remain as true as possible to the original spirit of Lesson Study we made some adaptations in order to suit our context (Table 1).

Turning points

As Lesson Study was developed and teacher triads worked through their first cycle, changes were immediately apparent. Polite and supportive exchanges about practice were replaced by rich and challenging conversations about learning, which were owned by the teachers themselves. A turning point in the first Lesson Study cycle was when one of the teachers said within the privacy of her triad: *“I’m not sure I can do this on top of everything else”*. Her colleague (who

Focus	Staff chose one area of focus from the questioning training as the basis of their classroom research.
Working group	Staff worked in cross-phase triads so that their focus was not the differences between phases, or subjects but rather the pedagogical similarities and parallels.
Lesson planning	Staff individually planned their lesson but consulted with their peers to help reflect and anticipate critical points where student response would be pivotal to learning.
Lesson observations and pupil interviews	When colleagues from working groups observed the planned lessons three target pupils were identified as the focus for the teacher's peers to observe. This shifted the focus away from the teacher as the pedagogue to the pupil as a learner. The target pupils were interviewed by the observers immediately after the lesson to capture their view of the success of their own learning.
Post-lesson discussion	The teachers then all participated in a post-lesson discussion to analyse the outcomes for the target pupils. Through this collaborative discussion the teacher began to reflect on their own pedagogy and how it had impacted on the pupils learning.
Role of 'expert other'	Claire acted as a 'knowledgeable other' or 'outside expert' role. Having also observed the lesson (focusing on her own target child) Claire played a key role in shaping the impact analysis, making suggestions for improvement, pulling together ideas, and tying the discussion to larger subject-matter, pedagogical issues and good practice literature as well as developing lesson study protocols to ensure deep learning for teachers.

Table 1. The model of Lesson Study adopted at Rickleton Primary School

went on to take the facilitator role in subsequent Lesson Study triads) responded, "Remember that we're not asking each other to do anything in addition to what we're already doing. We already ask questions all the time in our classrooms. What we're about is sharpening our skills and trying to change some of our habits and norms so that we are clearer in our minds about what we actually want the children to

think about and to learn." This was noteworthy because in terms of professional learning; the teachers had started to not only challenge each other but also to take ownership of the improvement agenda. Prior to this they had tended to talk in generalities, had failed to make tacit knowledge explicit, and glossed over differences so as not to offend.

The next significant turning point from a whole school point of view came when the first Lesson Study triad to complete their cycle presented their findings and views to their colleagues in a twilight meeting. As the teachers presented their findings the interest, engagement and excitement was palpable. Teachers who had previously never stood up in front of their colleagues to present learning about their practice had the undivided attention of their colleagues and rich and purposeful dialogue permeated their delivery.

Learning together

Teachers started to improve their ability to listen to understand through professional conversation and in turn started to create shared meaning. They were less afraid to challenge each other, as illustrated by this question from one to another, *"When you said that your students can't think at a higher level, do you mean they just aren't capable or is it about them not really being sure what higher order thinking looks like or sounds like?"* This was the beginning of a very revealing conversation that started to surface some beliefs about low expectations. In effect the dialogue was creating self-awareness in terms of existing assumptions and when they might be helpful or unhelpful.

Teachers became less defensive about their own practice and able to ask questions to clarify their understanding, exemplified by this question from a teacher whose lesson had been observed, *"I think you're right, I hadn't noticed that I do that all the time. How do you think this affected the response I got from the student?"* This led to further discussion about some of the ideas from the previous training on helping students to give a more extended response when questioned. The professional learning conversations were a source of reassurance as well as challenge. They were also a source of laughter and motivation as teachers became more comfortable and built up a sense of trust and reciprocity. In addition, teachers increasingly elaborated on others' ideas; *"I agree with what she said, if we all try to notice what we notice about the choices children are making we can look for some patterns."* This led to the development of a set of shared foci for subsequent Lesson Study cycles.

Gradually the teachers became more committed listeners who were keen to help their colleagues think more clearly, work through sticky issues and to work

out solutions together. By helping particular pupils to learn more successfully, in lessons they created collaboratively, they became much more mindful of the need to give close attention to the ways in which they supported the progression of skills and dispositions throughout the school. As Hargrove (1995) noted this is about listening beyond what people are saying to the deeply held values, beliefs and assumptions that are shaping behaviours and norms. The Lesson Study process provided a frame in which questioning (as both a pedagogical topic of focus and an adult learning tool), helped to build collaborative relationships as the teachers became better listeners.

Moving forward

Senior leaders and teachers in the school firmly believe that Lesson Study offers the potential for high quality and sustained professional development. As a result, Lesson Study will continue to be used to support teachers and students to work together to develop the quality of teaching and learning more broadly and to raise aspirations for both student and adults learning alike. To this end the school has now turned its attention to embedding Lesson Study within a broader approach to teacher effectiveness in which there is teacher led alignment with professional learning, performance management, team development time and the monitoring of teaching and learning. Though still a work in progress, the use of Lesson Study has supported staff to take agency for the continued development of their knowledge and skills through self- and co-regulated learning. By giving teachers greater ownership of the improvement effort the senior leadership team are now seeing teachers display a much stronger commitment to learn from, with and on behalf of each other and their students.

Practice-based professional learning at the heart of Lesson Study

We start to draw this chapter together by reflecting on the extent to which these cases relate to aspects of a 'practice development led model for individual professional learning and institutional growth' (Lofthouse, 2015). This model suggests three key attributes for professional learning and three significant resulting behaviours, and their potential links to Lesson Study are outlined in Table 2.

Attributes enabling professional learning	Creativity	Participants in Lesson Study are invited to solve the practical problems of professional engagement, and to focus on creating original lesson plans supported by colleagues who can bring new knowledge and ideas to their routine practices. Observing each other & focusing on 'case pupils' requires that they step outside traditional lesson observation procedures and open themselves up to range of perspectives.
	Solidarity	Lesson Study participants typically value the working partnership, particularly the experience of planning and reviewing lessons together as peers in a non-judgemental fasion. The focus on case pupils also helps them to develop a deeper understanding of specific learners and the ways that they are able to support them to achieve.
	Authenticity	Lesson Study is situated in teachers' lived experiences. They feel able to share professional narratives and concerns and to seek advice from colleagues who are familiar with the learning environment of the school.
Valuable resulting professional learning behaviours and cultures	Articulation	To engage in Lesson Study participants need to explain their pedagogic practices and dilemmas, explore their own and others' understanding and express their objectives. Lesson Study is often followed by presentations to wider groups of colleagues, giving teachers a formal platform to contribute to professional knowledge.
	Critique	Lesson Study encourages supportive critique through the co-planning of lessons, consideration of evidence and assumptions, shared observation and peer review. As such the Lesson Study sequence can open up a space for iterative and informed decision-making.
	Expansion	When working well Lesson Study challenges participants' understanding of subject pedagogy, of pupil learning and of their own teaching routines. It can thus support participants to develop new pedagogic approaches with the potential for practices to become more transferable.

Table 2. Enablers of Lesson Study and potential resulting professional outcomes

The two school examples illustrate well how Lesson Study can encourage teachers to talk about, work on and co-construct new practices. These become deeply contextualised by focusing on pupils in the real-life setting of lessons. It is through this context that teachers start to draw on prior experience, interrogate relevant information and data, hypothesise and consider pupils' needs and explore pedagogic principles. In these cases there is evidence that lesson study encouraged the teachers to probe and extend their thinking. In the first school this was probably aided by the fact that the participating teachers were 'early adopters' who continually look to extend their professional experience and commit to the demands of that. In the second example this was supported by the links made between lesson study and school-wide CPD. In both cases there is evidence of success, but it cannot be assumed that Lesson Study is inevitably productive and beneficial, at either individual or school level. As individual teachers engage and learn there is a potential for institutional growth, but this is not automatic. It is most likely to result from a conscious integration of the individual's growth with the organisation's supporting infrastructure.

Conclusions

One of the interesting aspects of the first school case study was the concern that the existing use of action research had not substantially encouraged collaboration between teachers, and the decision to pilot Lesson Study as a way to add this element to the experience of teacher-directed CPD. There is no practical way that Lesson Study can be adopted by teachers as individuals, although there is no guarantee that co-locating teachers in shared time and space directed for Lesson Study will create genuine collaboration. Prior research, which included a focus on student teachers using Lesson Study (Lofthouse & Thomas, 2015) drew on a definition of collaboration as an experience of united labour from which something of value is created or enabled by combined effort. This might be considered as distinct from co-operation, in which it is possible for a group of people to decide how to carve up tasks to complete a whole, only coming together to check individual progress towards the end point and to collate individually achieved outcomes. Of course teachers working in Lesson Study groups could pay it lip service, failing to take significant advantage of it as an opportunity for co-enquiry and co-construction. A study of teachers engaging in Lesson Study in the the Philippines indicated that improvements to teaching were 'sustained through the constant collegial and constructive interactions of the Lesson Study team and the knowledgeable others' (Gutierrez, 2016, p.813). In the two case studies presented here this interaction seems to have been

achieved. Another quality of the two case schools is that Stef, Colin and Claire all have a background in coaching; having developed and/or studied coaching for a range of professional purposes. As senior leaders, participants and expert others this background may have sustained a focus on quality and characteristics of the professional conversations in the Lesson Study triads.

That does not mean that there are no challenges ahead. In the secondary school a concern would be scalability. How easy will it be to take the pilot, in which the Stef as senior leader and with the momentum of his Masters module acting as a press, and scale it up to include more colleagues while maintaining focus and quality? Will Stef's recent departure to a promoted post in a new school interrupt the progress of Lesson Study as a key form of CPD, or has the pilot created enough legacy to ensure continuity of development? In the primary school the concern might be the sustainability of the external facilitation and expertise provided by Claire. In a time of tightening budgets will her role as 'expert other' be maintained, and if it is can her time be used to ensure that there is a sustainable future which secures a succession plan to build on the growing expertise of teachers to support Lesson Study internally?

What is clear is that given the right conditions and senior leader support teachers can gain significantly from working collaboratively through Lesson Study. Their combined effort can be effectively orientated towards the aspects of practice that they experience as creating relevant opportunities for teacher inquiry. The structure seems to help to focus minds and guarantee ideas get taken into practice and collectively reviewed. Lesson Study can create professional conversations and relationships that open classroom doors, infect staffrooms and build confidence and capacity for the changes that teachers themselves want to make.

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