

# **The Routledge International Handbook of Research on Dialogic Education**

Section Overview: Dialogue, Teachers & Professional Development

## **Teachers' collaborative dialogues in contexts of Lesson Study**

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### **Abstract**

*Lesson Study is a model of teacher professional development that has seen a worldwide increase in popularity in recent years. Teachers collaboratively review their approaches through planning and reflecting on cycles of 'research lessons'. Dialogue therefore becomes a core mechanism in the development of their learning and practice. This chapter aims to provide an overview of the nature and potential of Lesson Study professional dialogues. It draws on data from one large-scale project with Mathematics teachers from primary and secondary schools in London. Through a qualitative analysis of case study examples, the chapter aims to demonstrate features of these dialogues that are productive in relation to subsequent practice development. Implications for teacher professional development are discussed.*

### **1. Introduction**

Lesson Study (LS) was developed in Japan on the 1860s and 70s (Dudley, 2019) as a mechanism for developing, transferring and mobilizing classroom practice as the country opened up to the world, modernised and established a state education system. It is based upon collaborative teacher enquiry into how to improve pupil learning by

improving teaching and curriculum. In these enquiries teachers study the curriculum and teaching and learning sequences they currently use and also what is known about more effective approaches. They collaboratively plan, teach and observe ‘research lessons’ (RLs) in which they introduce new elements of practice or curriculum designed to improve pupil learning. In post lesson discussions, they analyse the learning they observed in the research lesson and may then plan further research lessons. These take account of what they found about the way pupils responded to the newly introduced elements in order to improve the teaching or curriculum model further. Once they believe they have found something of note, which other professionals would benefit from, they will pass on the newly found knowledge.

Such collaborative, research-focused and semi-public approaches to practice-development by groups of teachers working in each others’ classrooms, were relatively new when the Japanese model first became known in the West at the very end of the last century. In England most teachers’ experiences of teaching with a fellow professional in the classroom were associated with ‘performance management’ or external government inspection. Neither was conducive to the risk taking and sense making demanded by professional learning that changes practice (Dudley, 2015).

However, during research lesson planning and post-lesson analysis, LS group members engage in discussions that have been observed to further their professional knowledge. These ‘professional dialogues’ taking place in safe learning spaces became powerful mechanisms for learning. In these discussions it was acceptable to take risks, or to acknowledge gaps in one’s professional knowledge or experience. The LS discussions became a context for building collective knowledge by thinking together about pupils whose success in each RL was a joint endeavor; a goal shared by each member of the group with increasing passion. Teachers consistently identify the experience of participating in these discussions as the most distinctive and important aspect of LS and one that sets LS apart from other related models of professional learning such as peer or specialist coaching (Dudley, 2013).

In this chapter we will explore the dialogic nature of LS discussions, focusing in particular on dialogue forms that promote professional learning. We will also explore the modes of analysis that have proved fruitful in revealing the learning occurring in

these discussions and the nature of the forms of knowledge that are drawn upon and developed. This includes how dialogue can help to surface deeply hidden, tacit forms of practice knowledge the absence of which in other forms of professional development can constrain teacher learning.

## **2. Lesson Study model**

The Lesson Study model used in the studies referenced in this chapter was developed in the UK. This model was based upon the Japanese Lesson Study (JLS) with elements of its Chinese variant (CLS) (Dudley, 2012; Dudley, Warwick, Vrikki, Vermunt, Mercer, van Halem & Karlsen, 2018). Takahashi and McDougal (2016) summarise the key elements of JLS as (i) joint teacher curriculum study or 'kyouzai kenkyuu' (of progression, both leading up to and following the unit); (ii) collaborative lesson design by the LS group (detailing critical features of the lesson or unit design and what we can learn from them); (iii) progress related to the school's research theme and (iv) the next steps for future teaching. A fifth phase occurs when the 'findings' or what has been learned from the RLs are made public, for example when the new approach may be built into a 'public lesson' taught before invited guests. It is common in JLS for expert practitioners to join the LS group and that every public research lesson is attended by an expert 'commentator' who will join the discussion from a university or school district.

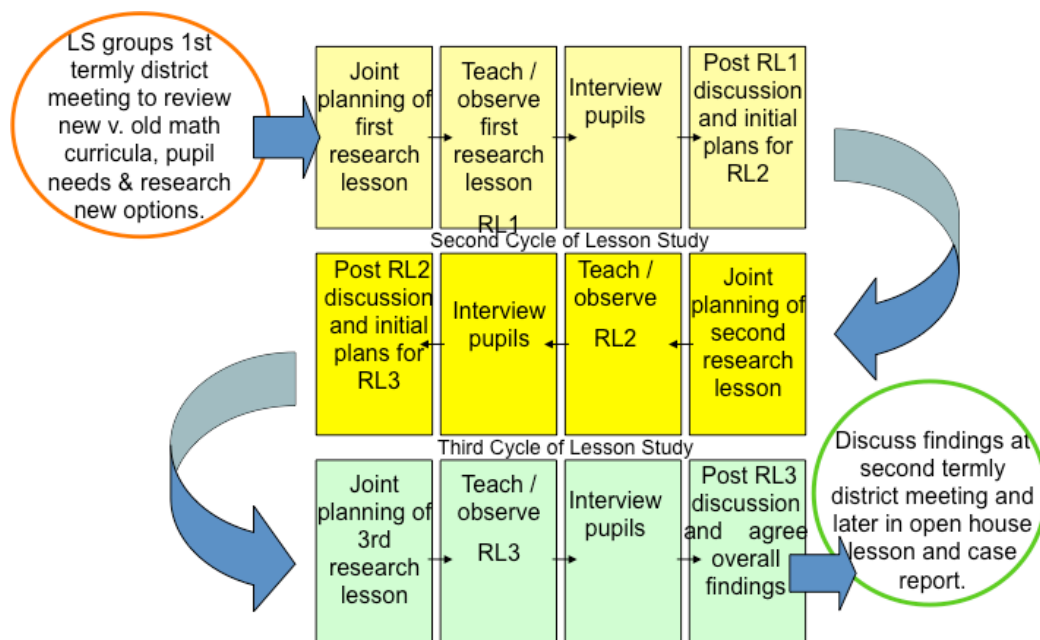
While the JLS groups are planning and conducting their LSs, they work collaboratively. Often one person may take a lead in planning the RL and others will contribute in meetings or via email. That person will teach the RL while colleagues observe. A post lesson discussion involving the whole group follows. The nature of the post lesson discussion is strongly collaborative and focused on analysing how well the lesson enabled pupils to learn and how future teaching or research lessons should benefit from this. The nature of the discussion in the public research lesson is usually more formal with each invited guest taking turns to ask questions of the teacher and LS group. These are followed by commentaries from the teacher, perhaps the school principal and by the local expert commentator.

The Research Lesson Study (RLS) model developed in England (Dudley 2012)

includes some modifications introduced by co-developing teachers in the development pilot. These resulted from the negative features associated with observed teaching referred to above and also because of the growing influence at the time (2003-5) of socio-cultural learning models (Mercer 1995), learning as participating in communities of practice (Lave and Wenger, 1991) and growing understanding of the role that student perspectives can play in improving classroom learning (Rudduck, 1996).

This culminated in the RLS design seen in Figure 1 below. This ‘Research Lesson Study’ model (Dudley 2003) includes cycles of three RLs and the use of both ‘case pupils’ and pupil interviews.

**Figure 1. Research Lesson Study process**



Source: Dudley, 2014. P. 5.

The three RL cycle emerged from the consistent finding by LS groups in the pilot that the first RL revealed new features of their pupils as learners that frequently rendered aspects of the RL plan redundant and required a second attempt. (Usually these are sequential lessons with the same class but where parallel classes have similar lessons the approach can be used with the same RL in different groups.) . The third RL is used to test out hypotheses emerging from the first two RLs before sharing the new

practice-knowledge more widely. The three-RL cycle allows interleaving of observation and reflective sense-making and thus promotes a dialogic approach to teacher learning. Five other innovative features of RLS that were designed and adopted in order to promote exploratory talk (Barnes and Todd 1977) in the planning and post lesson discussions are:

- (i) A protocol (Dudley, 2014) for lesson study group behaviour designed to stimulate exploratory talk, risk-taking and mutual accountability;
- (ii) The introduction of ‘case students’ whose intended learning is imagined in detail by the lesson study group and from which predictions about their in-lesson behaviours are made and whose actual responses in the research lessons are observed. These form the basis of the agenda of the post lesson teacher discussion.
- (iii) A three RL cycle allowing the group to act upon these observations and to adjust the second RL accordingly (Teachers frequently find the constructs of the children *as learners* that they held in their heads prior to the close observation in the first RL were a long way off the mark. (Dudley, 2013) The third RL serves to test hypotheses formed during the first two RLs.
- (iv) Three discussion interviews with pupils following RLs designed to elicit their perspectives on what might have improved pupil learning in the lesson.

One aspect of RLS that evolved similarly to that of CLS (Huang, R., Fang & Cheng, 2016) relates to the wider participation of local schools in conducting similarly themed lesson studies and sharing their findings together. District level meetings of the lesson study groups with local facilitators take place prior to and after the lesson studies are conducted. This is the model of RLS used in our case study in this chapter involved groups of schools carrying out and sharing lesson studies in order to develop a local (London) approach to the new National Mathematics Curriculum for England (DfE 2013). It is set out in Figure 1 below.

A review of the literature that follows will explore the affordances this model offers for teachers’ collaborative, community enquiry and dialogue-centred teacher learning.

### 3. Literature review

Models of LS involve one or more cycles of RLs (See Figure 1 above) collaboratively planned and the role of talk in the processes of both teacher and pupil learning is of critical importance. In JLS observers of RL's will often lower themselves to desk height and take photographs of the proceedings from the perspectives of students. Lewis, Friedkin and Dotger (2018) usefully summarised pedagogical approaches to making pupil learning visible in lesson studies. Nagoya University has focused for five decades on analyzing pupil learning in lesson analyses (Kuno, 2012) sometimes by transcribing pupil discussions in research lessons and using these transcripts (sometimes with teachers reading pupils' words in role) to 'get inside the heads' of their students (Gardner, 1991 in Bruner 1996 p. 6) and thus better to understand their conceptions and motivations.

Here, however, we focus on the role of talk in teacher learning, in contexts of LS. But before we explore this, we will briefly consider the nature of lessons as places for working and learning and the implications of this for the professional learning of teachers. Lewis (1998) borrowed a Japanese expression about the nature of teacher knowledge and practice within lessons in her article 'A lesson is like a swiftly flowing river.' The classroom is one of the most fast-moving, unpredictable and complex working environments that exists. It is impossible for one person to be consciously aware of all that is going on at any one time in a lesson involving thirty pupils, let alone to attempt to be so and at the same time to lead the lesson. An unconscious human response to fast moving and complex situations is to internalise sequences of processes involved so that when a similar complex set of circumstances occurs in a later lesson, these are detected and responded to without the need for conscious recall or thought. This allows teachers to concentrate on the matter in hand (which of course demands their conscious thought and recall) without having to interrupt this conscious train of thought and decision making in order to deal with every emerging circumstance. A good example of this might occur when a teacher unconsciously responds to change in noise level or body language in class by changing her own body language or location in the classroom but does so without interrupting a critically important conversation she is having with a pupil - with whom she maintains eye

contact and dialogical engagement throughout. These automated chunks of practice knowledge are in the form of tacit knowledge and their invisibility to teachers makes changing practice hard because tacit knowledge sequences can make up the majority of a typical teacher's overall practice knowledge (Eraut, 2000).

A well-established literature has identified the benefits that can be played by 'exploratory talk' in the learning of students (Barnes and Todd 1977; Mercer 1995, Littleton and Mercer, 2013). Exploratory talk occurs when members of a group with a shared learning task begin to think 'as one' by taking turns to reason aloud, make suggestions, elaborate on another's contribution, challenge or support an idea, form shared hypotheses and courses of action. They negotiate meanings and can resolve problems that none of the group could have done alone. But to do so they must first create the ability for the group to function in this way, firstly by establishing the right of each group member to participate (through a period of 'disputational talk' :- 'No let's...., 'No let's.....' 'No let's....') and then by acknowledging the affordances of the group (through a period of 'cumulative talk' :- 'Yeah and we could... 'Yeah and we could...'). Disputational and cumulative talk are not generative of collaborative learning themselves, but rather they create the social dynamic conditions for the emergence of exploratory talk within the group. It is important in relation to teacher dialogue in context of LS that Mercer and Littleton also stress the fact that discussion does not of itself facilitate exploratory talk. Ground rules for group talk need to be established in order for this to happen.

Analyses of teacher talk in coaching discussions have focused on teacher talk-patterns between coaches and coachees (Lofthouse, Towler and Leat 2010) and in JLS (Suzuki, 2012) and have revealed comparable dialogical moves to those observed in contexts of RLS (Dudley, 2013). Lofthouse and Hall developed these observations to help create a toolkit which helps novice coaches to recognise and employ habits of dialogue in order to help optimise the facility for teacher coaching discussions to promote change in subsequent practice (Lofthouse and Hall 2014).

Dudley (2011, 2018) gives an account of how the RLS model was co-designed by teachers in the light of their reflections on the experience of how the tight-knit

communities of enquiry that lesson study groups quickly became, affected the nature not only of what they learned in their lesson studies but *how* they learned it. They consistently reported (and do so to this day) how working as a member of a collaborative group of professionals helped them to feel safe within the group and less afraid of venturing an idea or disclosing a weakness – whether or not expert practitioners are present. They also remarked on how the jointly planned lessons became jointly owned and that this meant that if something ‘went wrong’ it was not seen as one person’s weakness but because the research lesson was jointly owned it was seen as a shared learning point. This led to design-evolutions in RLS that deliberately increase opportunities for learning observation-informed discussions and dialogue.

Using interaction level discourse analysis to study teacher learning in RLS, Dudley (2013) found that teachers swiftly move from disputational and cumulative talk into exploratory talk (Mercer, 1995) as a result of their motivation to help their pupils learn and because they feel ‘as one’ with the LS group. This suppresses their individual self-consciousness at the expense of the group’s joint consciousness, promoting ‘interthinking’ and creating an inter-mental zone of proximal development (Mercer, 2010). In RL1 discussions exploratory talk was mostly seen as teachers engaged in ‘development interaction sequences’ in which they reasoned, suggested and developed (including elaborating) ideas whereas RL3 interaction sequences focused more on deep reflection and hypothesising as they looked back and evaluated their pupils’ learning and decided what to take forward into their teaching.



**Figure 2 How RLS organises talk and knowledge development for teachers and pupils**

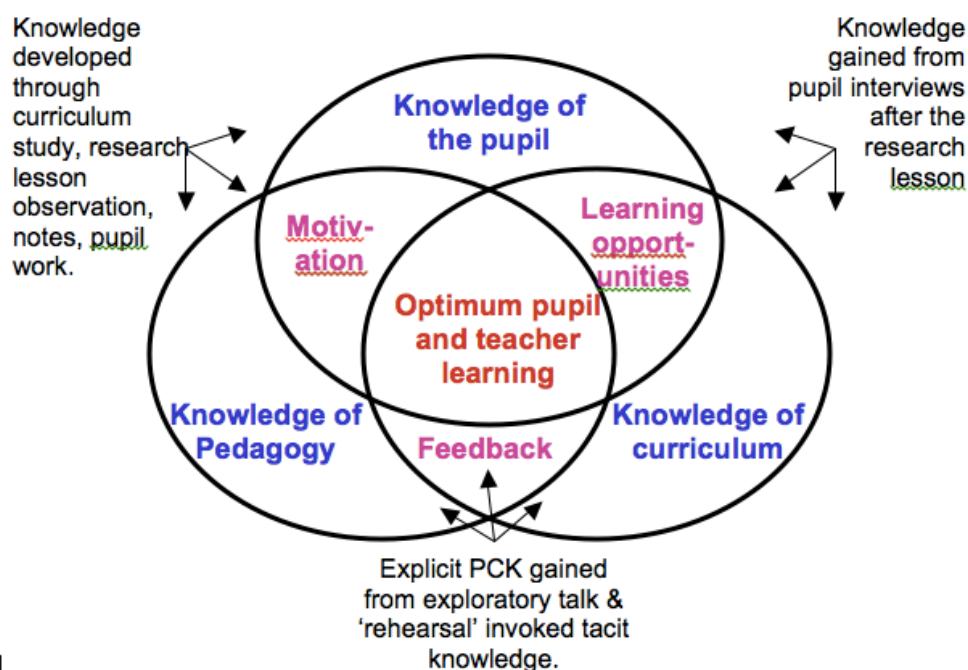


Figure 2 (above) illustrates the reflexive inter-relationships between the knowledge teachers draw upon in these discussions from their reviews of their current curricular and pedagogical approaches as well as their knowledge of their specific pupils, and how these forms of knowledge are developed through the iterations of RLs enabling the new knowledge that they develop together to be used to optimise subsequent student learning.

LS group members in the study engaged in developmental interaction sequences reflecting on their learning goals, their curriculum and the RL in hand; they hypothesised about why something had not worked well in a RL just observed and what might work well for that pupil next time. They were most likely to change their views, accept new practices and let go of old ones (elements of learning) while actively, collaboratively hypothesising about pupils learning in this way or by engaging in ‘rehearsal’ to do the same thing. Rehearsal occurred when the teachers tried-out together utterances or sequences of utterances from planned (or observed) lessons in role (using their ‘teacher voices’) and then imagined the responses of the pupils. In the exchange that follows from a RL planning discussion, we hear teacher A use rehearsal (italicised) to explore question forms for helping children to use a

thermometer to count forwards and backwards across zero. This allows teacher B to imagine how the question will feel for pupils: ‘open’.

A: Number one: *'You have to end up with a negative number'* or *'You have to end up with the number 'minus thirteen'*. Number two: *'You've got to show that the temperature goes up but you must still have an answer of minus ten'*. You know, something like that.

B: ..and that keeps it [the question] open as well, doesn't it!

A: And that's why they need to think of the calculation that would give them that answer.

‘Rehearsal’ was observed to lead teachers to elicit and utilise usually invisible tacit knowledge. This approach was developed further by Chinas (2016) who discovered similar patterns of teacher talk in RLS.

Xu (2015) used similar analyses of teacher group discussions while engaged in LS in a school district in China, finding that disputational and cumulative talk played important roles in mediating and affording exploratory talk and teacher learning in two school groups engaged in CLS in China.

The RLS model has therefore developed a discussion protocol governing behaviours and attitudes of the LS group that established ground rules for talk, the need to respect (but not necessarily agree with) all contributions and to abandon normal hierarchies and come together in a ‘safe space,’ equal as learners and with a shared endeavour of pooling knowledge, experience and expertise to improve pupils’ learning (Dudley, 2014).

Thus, just as LS can be seen to be a fruitful deliberate process for teachers to elicit evidence of pupils learning through talk, to study or assess it and then to improve it (Dudley, 2013; Norwich, Dudley and Ylonen, 2015), it is an equally fruitful process for eliciting teacher learning through talk and for studying it (Huang et al. 2017). It can also be seen that supporting certain approaches to teacher talk in LS and avoiding others may prove helpful for teachers intending to improve their professional and curriculum development and their practice-knowledge creation through LS.

This leads us to our case study of teacher talk in a mathematics- based LS context in London.

#### 4. Case Study of teacher talk in a LS context

This example is drawn from a large-scale research and development project run by the Camden Council and the University of Cambridge (2013-2015) which aimed to incorporate LS into the practice of teachers in primary, secondary and special schools (Years 5 to 8) in London, in order to help them to develop curriculum maps for the new national mathematics curriculum that were tailored to the needs of their London pupils. Specifically, teachers formed LS groups of 3-4 teachers in their own schools and to carried out one lesson study (see three-cycle model described in Section 2) per school term. This way, teachers had the opportunity to participate in three Lesson Studies per school year. Prior to the beginning of a lesson study, teachers attended project-wide “LS Focus and Planning meetings” organised by the Camden team (led by Pete Dudley and Jean Lang). These conferences initially aimed to familiarise teachers with the Lesson Study model and subsequently to identify their focus, to study the new curriculum’s mathematical and pedagogical issues and to create a plan of action. Similarly, at the end of each Lesson Study teachers were encouraged to share their lesson studies in “Feedback Meetings” bringing together their experiences. As additional help, a LS workbook, prepared by the Camden team providing space for teachers to write their notes and to collect and organize their data also contained prompts that teachers were encouraged to follow in order to facilitate their planning and reflection of research lessons. Teachers were asked to video-record all their Lesson Study meetings and send those video recordings to the Cambridge team, who prepared feedback presented at the LS Focus and planning meeting the following term.

Excerpt 1 presents part of a discussion that took place in a reflection meeting of a team of male teachers from a secondary school (14-year old students). The aim of the lesson was for students to be able to explain their thinking when they engage in mathematics problems. Teacher B was the classroom teacher of the class under study, while Teachers A and C were present during the research lesson.

##### Excerpt 1

| Line | Teacher | Turns   |
|------|---------|---|
| 1    | B       | But let’s just concentrate on these three. “What progress did |

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|    |   |   |
|----|---|---|
|    |   | each pupil make? Was this enough?" [reading out of the workbook]  |
|    |   | [...]   |
| 2  | C | I think Joel, of the three [case pupils], probably made the most progress in terms of verbalising his ideas. He did come up to the front at one stage and demonstrate to the class. I think, between him and, what's the other boy's name?                                    |
| 3  | A | Maz.  |
| 4  | C | No, the one who came to the board and described.  |
| 5  | A | Edison.   |
| 6  | C | Between Edison and Joel, I think they got there, in the end, where we wanted them to be.  |
| 7  | A | Well, they got to the extension work, which we decided we wouldn't ask them to do. They actually took that and figured it out. I thought what was impressive was all of the extension ideas that we discussed potentially giving them came up, different sized                |
| 8  | C | [Inaudible]   |
| 9  | A | What about the different numbers?   |
| 10 | C | Yes.  |
| 11 | A | I talked to Maz and it ended up by, 'The [inaudible word] number, what difference does that make?' And, with a little bit of prompting, he figured that out. But I only did that to see, if we'd had more time, could we have got there? I think we probably could have done. |
| 12 | C | So that's probably a starting point for the next lesson. OK, so what we're saying is, are we just doing progress?   |
| 13 | B | So he made progress in verbalising, explaining and demonstrating, which is what we're looking for here.   |
| 14 | C | Yes, and I think he even got the extension.   |
| 15 | B | "Was that typical of others in that group of learners at the top end of the class?" [reading from workbook]   |
| 16 | C | Yes, because the one with algebra and, certainly, Edison had the  |

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|    |       |  |
|----|-------|--|
|    |       | clearest explanation. For him to have explained it that clearly, he obviously had a very clear explanation in his mind as to why this is working. Because I found that many of the students, they almost had the clarity in their minds, but they couldn't verbalise it. |
| 17 | B     | Yes, and that's where we want them to make the progress, isn't it?   |
| 18 | A & C | Yes.   |
| 19 | A     | That's the key thing there, the difference for the next two.   |

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Excerpt 1 starts with a question from the workbook that encourages the teachers to consider the progress of each case pupil. In comparing the three case pupils, Teacher C evaluated that Joel made the most progress. He justified his opinion by describing Joel's actions, referring to his demonstration in front of the class (line 2). Teacher A then added that not only Joel (and Edison) met their expectations, but they exceeded them (line 7). He justified his thinking by referring to the extension work that was not intended for these students initially; in other words, the students' abilities were a surprise for these teachers. This prompted Teacher A to reflect on the planning of this lesson and the extension ideas that they had discussed but were eventually not included. On line 11, Teacher A shares with the group his conversation with one student, Maz. That conversation showed Teacher A that (with a bit of prompting) students were able to figure out the answer so he concluded that if there had been more time then they could have included that too. Teacher C then adds that this should be their starting point for the next research lesson (line 12). Teacher B summarizes their discussion about the case pupils (line 13).

In terms of learning, teachers share information from the research lesson, either from their personal conversations with students or from their observations. This description certainly contributes to developing insights on the events of the research lesson. Apart from descriptions, teachers give their own evaluations of certain events. Here, Teacher A believes that Joel made the most progress out of the three case pupils and provides a justification for his belief. He evaluates students' abilities when he supports that the students exceeded the teachers' expectations. And, as a result, he evaluates their teaching plan, which could have contained more prompting, more time and more

extension ideas. These evaluations reveal more interpretative thinking. In our work, these two levels of thinking were named “descriptive learning processes” (DLP) and “interpretative learning processes” (ILP) (Warwick, Vrikki, Vermunt, Mercer, & van Halem, 2016; Vrikki, Warwick, Vermunt, Mercer & van Halem, 2017). DLP represents the co-constructed knowledge of teachers at the level of representing what is known, while ILP goes beyond description and towards evaluation, diagnosing and a consideration of ‘next steps’. Both seem to be important in developing learning through Lesson Study discussions.

The mechanism for the above functions to emerge in this collaborative environment seems to be dialogue. As discussed in Section 2, dialogue in professional groups varies in quality (Littleton & Mercer, 2013) with some groups’ discussions being more effective than others. In order to explore the productivity of dialogue in our project, we adopted a socio-cultural theory typology approach, which ‘focuses on the use of language as a social mode of thinking’ (Mercer, 2004: 137). In other words, we study how each speaker in turn contributed to the joint creation of knowledge and common understanding.

There seems to be increasing consensus among scholars in the field of educational dialogue that features of exploratory talk are productive (Littleton & Mercer, 2013; Howe & Abedin, 2013; Vrikki et al., 2018). In Excerpt 1, we see teachers justifying their opinions; in line 2, Teacher C explained why he thought Joel made the most progress; in line 16, Teacher C justified why he thought this progress was typical of others in that group by referring to Edison. Teachers were building on each others’ ideas. On line 7, Teacher A builds on Teacher C’s ideas on Edison’s and Joel’s progress. He also builds on these ideas on line 11 where he talks about his conversation with Maz. Another characteristic of productive talk is coming to a consensus, which Teacher B does very well in this case. In line 13 he summarizes what has already been said about case pupils. Similarly, in line 17 he picks up the idea that verbalisation is where they need progress and repeats this as a summary of the discussion, with the others in agreement. We call these features “dialogic moves” because they ‘move’ dialogue forward.

Dialogic moves, however, need to be accompanied by supportive interactional cues in order to create a productive environment. In our work, we called these “supportive moves” (Warwick et al., 2016) and we characterised them as ‘interactional cues [...] which could be found either physically (e.g. nodding) or verbally (e.g. minimal responses)’ (p. 562). In Excerpt 1 the teachers’ use of ‘we’ (e.g. lines 11, 12) supports the dialogue. It creates a sense of community, which makes a collaborative effort to address issues in teaching. The video data also reveals teachers nodding to the teacher who is speaking, again creating a sense of respect and acceptance of each others’ ideas. Such interactional cues do not take the thinking forward but they are important in creating a suitable environment for dialogue to emerge.

## **5. Implications for practice, research and policy**

In this chapter we have sought to make a case for LS as an important process for teacher learning that improves pupil learning through joint deliberate practice that cyclically interleaves review of current teaching and observed pupil learning with reflective and reflexive LS group dialogues. Dudley (2013, 2018) has also reported evidence of the sense of shared endeavor and learning community generated in LS groups.

One key implication of this therefore is the need to develop more sophisticated toolkits than currently exist to help lesson study group members and facilitators to purposefully engender forms of talk that are conducive to the affective conditions in LS groups: where it feels a duty to study current evidence carefully before starting; where it feels ‘safe’ both to disclose gaps in professional knowledge and to take (informed) risks in order to bring about improvement.

Such toolkits would need to be mediated by knowledgeable practitioners working to equip users with the know-how to orchestrate use of an array of interactional cues and dialogic moves (providing reasons, challenging, elaborating, coming to agreement) in order to enhance a LS group’s learning; promoting hypothesising and also encouraging use of ‘rehearsal’ to summon up hidden tacit knowledge. Overt ‘meta’ understanding by these experienced toolkit mediators of ‘meaning-oriented’ and ‘descriptive’ learning processes and how to orchestrate these processes through talk is

also likely to increase teacher learning in LS groups that changes practice to improve pupils' learning.

It is also important to guide school and system leaders in the practicalities of making LS sustainable and indispensable by 'plumbing it in' to local systems and practices so it becomes part of the way a school and a local school system improve. District level LS cycles can create the habits and routines that facilitate individual schools and teachers' involvement and that mobilise the knowledge gained to all. In our case, for example, after the end of the project around 45 schools formed three self-run Lesson Study hubs in different areas of London that helped them continue their practice for two further years.

But above all we would stress the unique contribution that systemic, collaborative forms of enquiry-driven teacher learning or 'collective professionalism' such as LS (Hargreaves, 2018) can make to dialogical, classroom-centred teacher development that is increasingly being shown to improve pupil learning and which teachers themselves both value and find fulfilling.

## References

- Barnes, D. and Todd, F. (1977) *Communication and learning in small groups*. London. Routledge and Kegan Paul Ltd.
- Bruner, J. (1996). *The culture of education*. Harvard University Press.
- Chinas, M. (2015) *Mediation of Teachers Learning Through Talk Within a Professional Learning Community: a Case study in Cyprus*. Presentation at the annual conference of the European Association for Research on Learning and Instruction, Limassol, Cyprus, 25-29 August 2015.
- Dudley, P., Warwick, P., Vrikki, M., Vermunt, J., van Halem, N & Karlsen, A. (2018) *Implementing a new mathematics curriculum in England: district Research Lesson Study as a driver for student learning, teacher learning and professional*



dialogue in *Theory and practices of Lesson Study in mathematics, an international perspective*, Springer, New York.

Dudley, P. (2011) *Lessons for Learning: how teachers learn in contexts of Lesson Study*, unpublished Doctoral Thesis.

Dudley, P. (2011) Lesson Study development in England: from school networks to national policy, *International Journal for Lesson and Learning Studies*, Vol. 1 Issue: 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 fresh evidence of pupils learning, to develop practice knowledge and so enhance their pupils' learning*. *Teaching and Teacher Education* 34 (2013) 107-121

Dudley, P. (2014). Lesson Study: a handbook. [www.lessonstudy.co.uk/](http://www.lessonstudy.co.uk/)

Eraut, M. (2000). Non-formal learning and tacit knowledge in professional work. *British Journal of Educational Psychology*, 70(1), 113-136.

Hargreaves, A. and O'Connor, M. (2018) *Collaborative Professionalism: when teaching together means learning for all*, New York, Corwin

Howe, C., & Abedin, M. (2013). Classroom dialogue: A systematic review across four decades of research. *Cambridge Journal of Education*, 43(3), 325-356.

Huang, R., Fang, Y, & Cheng, X (2017) Chinese Lesson Study: a deliberate practice, a research methodology and an improvement science. *International Journal of Lesson and Learning Studies*, 6(4) 270-282

Kuno, H. (2013) *Lesson Analysis: a useful tool in teacher professional development*. Lecture given at the University of Cambridge Faculty of Education, 10 July 2013.

Littleton, K., & Mercer, N. (2013). *Interthinking: Putting talk to work*. Routledge.

- Lewis, C. (1998). A lesson is like a swiftly flowing river: how research lessons improve Japanese education. *American Educator*, (Winter), 12-17 & 50 - 51.
- Lewis, C., Friedkin, S. & Dotger, S. (2018) Making student learning visible in research lessons, WALS Webinar series. World Association of Lesson Study. <http://www.walsnet.org/blog/2018/05/29/making-student-thinking-visible/>
- Lofthouse, R., Towler, C., & Leat, D. (2010). Improving coaching: Evolution not revolution. Reading: CfBT Education Trust.
- Lofthouse, R., & Hall, E. (2014). Developing practices in teachers' professional dialogue in England: using Coaching Dimensions as an epistemic tool. *Professional Development in Education*, 40(5), 758–778.
- Mercer, N., Dawes, L., Wegerif, R., & Sams, C. (2004). Reasoning as a scientist: Ways of helping children to use language to learn science. *British Educational Research Journal*, 30(3), 367–385.
- Norwich, B., Dudley, P. & Ylonen, A. (2014) Using lesson studies to assess students' learning. *International Journal of Lesson and Learning Studies*, 3(3) 192-207
- Suzuki, Y. (2012). Teachers' professional discourse in a Japanese lesson study. *International Journal of Lesson and Learning Studies*, 1(2), 216-231.
- Warwick, P., Vrikkki, M., Vermunt, J. D., Mercer, N., & Van Halem, N. (2016). Connecting observations of student and teacher learning: an examination of dialogic processes in Lesson Study discussions in mathematics. *ZDM Mathematics Education*, 48(4), 555-569.
- Vrikkki, M., Warwick, P., Vermunt, J.D., Mercer, N. & Van Halem, N. (2017). Teacher learning in the context of Lesson Study: A video-based analysis of teacher discussions. *Teaching and Teacher Education*, 61C, pp. 211-224.

Vrikki, M., Wheatley, L., Howe, C., Hennessy, S., & Mercer, N. (2018). Dialogic practices in primary school classrooms. *Language & Education*. DOI: 10.1080/09500782.2018.1509988

Xu, H. & Dudley (Under review) *Illuminating the Black Box of Collaboration: Interaction Function Analysis as a methodological approach for understanding collaboration and learning in lesson study contexts.*