Teacher Professional Learning through Lesson Study: Teachers' Reflections

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Abstract

Purpose

This study examines the experiences of five teachers working in two English secondary school subject departments after being given the opportunity to engage with Lesson Study (LS) to increase student performance in their subject areas. This study aimed to reveal the drivers for the teachers' engagement in LS, and how this experience of Joint Professional Development (JPD) might be contributing to their learning as teachers.

Design

This study applies an analytic approach to evidencing teacher learning, based on the work of Knud Illeris, offering this as a methodological contribution to the field of professional development literature.

Findings

Findings reveal that, despite all the teachers developing a passion for learning through LS, there are constraints on its sustainability and impact which can be attributed to the teachers' broader contexts and which affected them differently. The constraints centre on tensions between priorities and agendas within and beyond the school, related largely to budgets and visions of staff development.

Research limitations/implications

This focused study on two subject departments engaging in LS limits its generalisability in terms of findings. However, the study offers a practical research

application of a model of learning for analysis of teacher reflections on collaborative learning experiences.

Originality

Understanding individual teacher reflections on LS experiences, are under-represented in the literature in particular studies providing insights into conditions conducive and constraining to JPD.

Introduction

This research reports on teachers' reported experiences of engaging in JPD using LS within two secondary school departments in one English school[1] aimed at improving student outcomes. This initiative was supported by a Teaching School Alliance (TSA)[2] who, working with the National College for Teaching and Learning (NCTL) (Maxwell & Greany, 2015), were developing approaches to LS as part of their remit for research and development (R&D)[3]. The TSA was partnered with three universities who supported R&D as an integrated part of the other five elements of their 'big 6' Teaching School remit. This Alliance had secured two national, funded projects, both of which supported the use of LS in TSA schools and provided opportunities for strengthening partnerships between the school, the Teaching School and the wider Alliance. In the landscape of TSAs, this places school leaders, like the Vice Principal, as 'boundary spanners' (Wenger, 1998), between Alliance partners and teachers within their school. Although studying individual teacher experiences, the contexts of those involved in and supporting the two focal LS groups are important considerations (Mayrhofer, 2019).

The significance of contexts for JPD

This study was set in the English education system of high stakes testing, with pressure on school activities to contribute to student examination performance (West, 2010), with reduced school budgets, especially for teacher development activities (Weston, 2016). As a result, internally, school leaders have responsibilities for ensuring subject departments contribute to wider school performance targets. Through setting LS-related performance management targets, the VP monitored and evaluated LS against resource implications and demonstrable impact. This was not without risk. Whilst LS offers an opportunity to challenge the 'culture of nice' (Bae et al, 2016, p168) by legitimizing teachers to reveal and challenge assumptions and beliefs about teaching and learning, this contrasts with the prevalent use of observation for performance management as one which is feared by many teachers (Barrell, 2017; Page, 2011; Taylor, 2017a). The dissonance which is needed to engage in critical debate about developing practice (e.g. Mayrhofer, 2019; Mynott, 2017; 2019) needs a safe space for peer observation without teachers being judged (Lofthouse and Thomas, 2015; Shortland, 2014; Zaare, 2013).

A changing role for HEIs in practice development

Recent inquiries (RS-BA, 2018) have called for more teachers to become 'research literate' in order to generate evidence from the grassroots of practice, placing school leaders needing to support such research. Despite CPD and R&D being part of the 'big 6' remit of TSAs, this role is not always evident within the agendas of senior leaders in TSAs (Husbands, 2015; Dowling, 2016). Funding streams in England for school-based inquiry are now directed largely towards school-based, rather than University-led, research. School leaders need to take responsibility for both providing inquiry opportunities and facilitating the dissemination of knowledge about practice

generated from such inquiries (Godfrey, 2016; Kullberg et al, 2019; Whitney, 2019). This is not something for which leaders have been well prepared (Hargreaves, 1999; Talbert et al, 2010). Possible 'nutrients' (Godfrey, 2016, p306) schools could draw on to support school-based inquiry and knowledge mobilisation can include universities, local authorities and dioceses (Gu et al, 2016). As academics, the authors of this paper played a strategic role through the TSA R&D committee but also at school level, advising on: articulating research questions, designing studies and protocols for lesson observation and applying ethical principles, were those for which the school's leadership in the focal school for this paper recruited HEI support.

Lesson Study

LS, originally developed in Japan, has been adopted and adapted across international contexts (eg. Xu, 2016). Such cultural adaptations are not unproblematic, including at local school-cultural settings for professional learning and school improvement (Akiba & Wilkinson, 2016; Lim et al, 2011). Collaborative LS is the most common approach adopted in English schools, where teachers engage in cycles of co-planning, co-observing and co-evaluating lessons (Dudley, 2013; Takahashi & McDougal, 2016). The opportunity to critically reflect on whether the potential that deep critical reflection on planning for, observing and collecting evidence about student learning offers individual teacher learning for future practice (Bocala, 2015; Cajkler et al., 2015). This paper reports examples both of where the focus of each LS cycle and formation of the teacher group is derived from a practice problem experienced by teachers, or is identified externally, in this case by a school's leadership.

Literature reporting LS to date has focused on evidencing and evaluating the outcomes of such studies related to LS foci (e.g. Dudley, 2013). Reviews (eg. Takahashi and McDougal, 2016; Xu, 2016) note less evidence of the reflective experiences of the teachers' involved in terms of their own professional learning. Also under-represented are theoretical views of how LS can act as a mechanism for teachers' professional learning (Xu & Pedder, 2015; Xu, 2016). This study seeks, like that by Skott and Møller (2017), to focus on ways of theoretically understanding individual experiences of LS by applying a conceptual framework to professional learning. In this study, stepping back from those studies which use research lessons as the unit of analysis, the evidence base is of teachers' reflections on engaging with cycles of LS.

Theoretical Framework

This section outlines the conceptual framework used to understand how teachers learn when they engage with LS cycles. The research draws upon the work of Illeris (2011) and is based upon the three dimensions of learning and competence development. To build capacity for learning, alongside knowledge and skills, teachers offer opinions, insights, attitudes, values and many more personal attributes to improve their understanding. Teachers develop mental energy to learn through incentives which tap into their volition, motivation and emotions and help them develop a personal sensitivity. New information can change the incentive; they are closely interlinked. The interaction element is driven by how teachers participate in their surroundings and serves their personal integration within their school context. These three dimensions of learning combine to reveal teacher competencies, a combination of functionality, sensibility and sociality. We were interested to

understand, through the perceptions of two groups of teachers, situated in two secondary school subject departments, the following research question:

RQ: How do teachers reflect on their professional learning through Lesson Study?

A model of professional learning

In response to a dearth of studies applying theoretical approaches to understanding professional learning through LS (Xu & Pedder, 2015), a model for professional learning was selected, which focused on learning in the workplace. This recognises individual and relational dimensions to LS, as well as identifying what teachers learn through such activity. Illeris' (2011) model met these criteria and had not been explored before in the context of JPD. In this model dimensions to professional learning, *Incentive, Content* and *Interaction,* are perceived as interacting within a wider context (termed *Society*) (See Figure 1). These dimensions are insightful for revealing the challenges and value to teachers of engaging in LS as a form of JPD and this framework was used deductively to drive analysis of the interview data.

Insert Figure 1

When a teacher learns, it is important to understand the 'mobilisation of mental energy' involved (Illeris, 2011, p.13) – the *incentives*. This relates to emotions associated with a teacher's professional learning and the ways they respond to motivators, either intrinsically situated or extrinsically offered. In engaging with LS, these motivators drive high-quality LS enquiry (Elliott, 2019) possibly linked to age and experience of the teacher (Bocala, 2015; Dudley, 2013; Takahashi & McDougal, 2016). Whilst some teachers may intrinsically want to improve their practice, other drivers such as encouragement or directives from a school's leadership, may also provide teachers with the 'energy' to learn.

Illeris (2011, p. 13) asserts that 'there is no learning without some content'. By engaging with LS, teachers might deepen their understanding i.e. of *content* on a number of fronts, about:

- how students learn;
- how their pedagogies engage students;
- how to collaborate effectively with one other;
- the processes of evidence-collection to inform practice.

Making explicit and calling into question a teachers' existing bank of practical theories has been marked as a feature of high-quality LS (Elliott, 2019) and supports teachers in moving them towards viewing themselves as practitioner researchers (e.g. Taylor, 2017b).

Interaction is recognised as an important dimension to professional learning (Illeris, 2011) and dialogue with others is central to JPD. Rigorous scrutiny through conversations about such inquiry with a wide range of others fuelled by curiosity, honesty and open-mindedness has been noted as key to high-quality LS (Elliott, 2019). Such dialogic support can could come from peers, 'knowledgeable others' (Bae et al., 2016, p172) such as mentors (Cajkler & Wood, 2016), senior leaders in school or University staff who could support all three areas of teacher learning (Takahashi & McDougal, 2016) and from the students in LS classrooms.

For teachers to develop identities and practices as researchers is not straightforward and is dependent on school leadership prioritising inquiry and creating the environment and architecture for collaboration (Pedder et al., 2005). However, schools are places where many 'pressing agendas' (Cajkler et al., 2013) compete for attention.

Methods

Research Design

Academics ran an audit to ask teachers to self-report their engagement with inquiry and invited volunteers to be interviewed about their experiences. Teachers from one TSA secondary school responded. All had been involved in LS; three staff from the History and two from the English departments. The research was mediated by the Vice Principal (VP) acting as the school's research co-ordinator and link between the activities of the TSA R&D committee and school staff. This paper draws upon evidence from interview data generated by these five teachers. We acknowledge that data from a small sample set may be at best speculative but the opportunity to shine some light into the opportunities and challenges these teachers experienced when undertaking LS as a research approach designed to engage and promote their professional learning helps us better understand how JPD supports professional development. While data might indicate some improvement in student learning as a result of teachers engaging in JPD activities, these are at best also tentative. It is acknowledged that this is based on a small and biased sample, limited to one school, one school phase, one-hour long interviews with each teacher and a non-representative (self-selecting) set of teachers from the school as a whole.

Context of participant sample

The Head of History Department 'TC' was inspired through attending TSA events to use LS to help Year 10 students (aged 14-15) improve their performance in General Certificate of School Examinations. The other members of the department (Nigel, with 4 years of teaching experience, and a newly qualified teacher (NQT) Billy), agreed to take a departmental approach over a two-year period and contribute to

funded project one (see Stoll et al., 2012). LS cycles were used to explore how a particular taxonomy (Hook & Mills, 2007) could differentiate their lessons, employing a design-based approach to LS (Lewis et al, 2006). Early outcomes of LS were sufficiently encouraging for the VP to extend this approach to the English department. NQT Kelly and her mentor Peter, second in department, were asked to use LS to tackle perceived underperformance in literacy with year 7 students (aged 11-12). The VP gained funding to support this by joining a second TSA project for one year (see Churches, 2016).

Ethical approval for the study

Ethical appraisal of the study was completed as part of gaining approval for the study by the TSA's own R&D committee and research ethics committees at both authors' Universities. Decisions as to how to conduct the study were guided by BERA ethical guidance (BERA, 2011)[4] and locally negotiated. An information and consent letter explaining their rights to withdraw and plans for dissemination was shared with the teachers via their research co-ordinator (the VP). All five respondents agreed to participate and provided pseudonyms for use in reporting the study.

The data set

Interviews lasted around one hour and were digitally recorded, transcribed and checked for accuracy with the respondents. The interview schedule, which referred to teachers' responses in the prior audit, was designed to elicit the:

- Teachers' understanding of inquiry and its relationship to professional reflective practice
- Teachers' experiences of LS as a form of inquiry, including benefits and challenges
- Teachers' views on the ethical aspects of their inquiry

- Teachers' reflections on and suggestions for support for teacher inquiry.

The analytic framework: Applying Illeris' model

Illeris' model for professional learning (2011) was applied through deductive thematic analysis of teachers' reflective accounts of inquiry. Each interview transcript was analysed by one co-author, starting with transcripts for which they had not been present at interview, looking for evidence related to each of Illeris' three dimensions: 1. Content, 2. Incentive and 3. Interaction. For each teacher participant, evidence was tabulated for any relevant code identifying the relevant page number (For examples of the analysis see Table 1). Coded extracts allocated by each analyst was compared across the five teachers' accounts through discussion.

Insert Table 1

The analytic process of sub-coding the data was conducted by both researchers. Researchers revisited their original interview suggest a set of sub-codes. Through critical comparative discussion of the emerging evidence, the data was reduced to an agreed set of sub-codes (see Table 2). This remained faithful to Illeris' (2011) three dimensions of learning whilst reflecting the evidence provided by each teacher interviewed.

Insert Table 2

Through a constant comparative process (Cohen et al, 2018), researchers were able to draw up a list of key professional issues relating to Incentive (motivation), Interactions (relationships) and Content (practice). Whilst this coding will not reflect a wider sample of teachers' experiences, it illustrates an analytic process which could be applied to teachers reflecting on their JPD experiences.

Results

Within each dimension we present the main themes emerging, reported to illustrate the influence of stage of teaching career and leadership roles. This affords us the opportunity to demonstrate, as in Skott and Møller (2017)'s study, the effects on LS experience of context and individual orientations to this context. In the following account TC and Peter (both departmental leaders) form the first group with Billy and Kelly (NQTs) and Nigel (experienced teacher of four years) as group two, followed by indirect evidence from the teachers' perspectives on the VP's role.

The departmental leader experience

Motivation

As Subject Leads these teachers must respond to both senior leadership agendas and the needs of teachers within their department. TC and Peter saw LS as a vehicle and form of extrinsic motivation to achieve the performance management targets, agreed at senior leadership level with the VP.

> *my [target] was also one of my leadership roles; take a leading role in developing professional working relationships with other members of the department, so it was built into performance management (TC, p.22).*

To incorporate LS, TC took a departmental-wide view to collectively address the mixed student performance:

> *Students were getting A* in one paper and an E in another … it just seemed to be all over the place… we are now trying to improve the way the students understand the source-work questions* (TC, p.7).

Peter focused on his mentoring role with NQT Kelly, referring also to an intrinsic motivation to develop personally:

> *... in teacher training [observation] is put on how well you perform…but for me... being forced to have to think about… taking into account differentiation and looking at individual kids, it's really useful for my own professional development (Peter, p. 3).*

Collaboration with others

For Peter, investing in collaborating with Kelly brought unexpected gains for his own classroom practice, even as the mentor:

> *The biggest thing that came out of it (LS) for me is that I can plan lessons better because I've thought about everybody involved; I've collaborated with another teacher and therefore in future I can plan better lessons (Peter, p.5).*

TC and Peter felt that part of their leadership role had been to facilitate their LS team to buy into the vision for the purpose and potential of LS. Such 'teaming' was identified as a key enabling feature of Skott and Møller's (2017) study of Danish teachers using LS.

> *They* (the staff) *absolutely bought into it 100% … they found it really useful as a way of seeing what tight planning meant and what improving planning meant. We worked together to improve over all three cycles of the lesson and the last were quite startling* (TC, p. 24).

Leaders sought to use LS to promote cohesiveness and a joint approach to planning and teaching where everyone was a learner, with positive impacts for staff and students alike.

> *... for developing professional relationships in the department ... a positive way of developing trusting relationships with students, a working, learning relationship ... a positive way of observing lessons ... you are not ticking boxes ... there is no threat to it ... it is a joint approach and as a department that is invaluable (TC, p. 20).*

Learning about practice and research

In trying to use LS to improve student results, teachers quickly began to question how then should gather useful information, as Peter observes:

> *...there are technical things like the recording of lessons, taping of lessons, this idea that you can record a lesson then watch it at a later day – you've still got to find the time…and we do find the time because we [Kelly and I] get on well and that is what we do... (Peter, p. 8).*

The relationship between research and practice could be explored by working with the HEI academic:

> *What I have learnt so far it was immensely useful for you* (HEI academic) *to come in before we started as inexperienced researchers … I liked your phrase about what are you looking for in observation and you said 'it's the difference between what you imagine they are doing and what they are actually doing'* (TC, p.28-9).

TC reported enjoying working as a teacher-researcher enabling him to create some distance from the students to collect data.

> '*That time in the classroom in not quite a teacher role is great* (TC, p.12).

He could connect the dual aspects to teachers' learning: learning about research skills, (classroom observation) and practice improvements, (planning for teaching):

> *One thing we have learnt is that we are going to keep resources really simply, don't overcomplicate, don't bolt students down because you think they should cover everything you think they should cover* (TC, p.17).

His collective approach to LS implied a growing confidence to support other teachers with their research, as part of his leadership role.

Early-career teacher experiences

Motivation

NQTs Kelly and Billy, with experienced practitioner Nigel, cited a mixture of extrinsic and intrinsic motivations to engage in LS activities. They referred to being excited to

be part of a department-wide initiative (Billy and Nigel) and a national project (Kelly).

For Kelly, it was a chance to be recognised:

> *It was something I was invited to do. … it was just like a stepping stone to just show that I can do those things on top of my teaching* (Kelly, p.3).

Collaboration with others

Billy reflected that, during his training year he had tried to work individually, but that LS had changed his attitudes and beliefs about collaboration (e.g. Peña Trapero. & Pérez Gómez, 2017; Samaranayke et al, 2018):

> *I always wanted to do it right myself. That was silly and it has taken lesson study for me to realise that it is not a bad thing but only when it's non-challenging…Nobody is being judged when you are observed at the end of it* (Billy, p.15).

Billy appreciated spending time with experienced teachers:

> *I don't think there is enough opportunity normally for beginner teachers to actually look at what is deemed expert teachers, so I think that aspect is really nice* (Billy, p.6).

The need for safe spaces to work productively with departmental colleagues was a common theme for early-career teachers, expressed eloquently by Nigel:

> *Probably the central thing that we learnt was actually sitting down planning together … it was a non-judgemental environment … although it was focused on a piece of paper or a recorded interview or whatever, it was a safe space and a creative space, a focused space and an improvement space* (Nigel, p.1-2),

Learning about practice and research

Skills which straddled both teaching practice and research were developed through LS collaborative spaces.

> *Are we asking the right questions of the student afterwards? I felt that after Nigel's lesson TC asked certain questions of the student and was like, wow, they're good questions … that would get the answers that we would need to keep us on track for our focus question* (Billy, p.31)

These practitioners were beginning to understand how LS offered an opportunity to become part of their everyday teaching,

> *[Research and teaching] are intertwined. The teaching doesn't stop when you have finished teaching in the classroom and the research doesn't stop when you come into the classroom, that another thing we liked about lesson study* (Nigel, p.2).

This provides evidence that LS can contribute to teachers recognising and challenging habitual practice to move to new understandings which can, in turn, move towards new unconscious habits (Mayrhofer, 2019). Even NQTs, like Kelly, could see how LS could be used across the school to challenge normative practice:

> *It could encourage different departments to think about, maybe looking at the results from last year …so I think it's about getting out of that fixed mind set and lesson study enables you to experiment with different things" (Kelly, p.11)*

Significance of student feedback

As in other studies of LS (e.g. Samaranayke et al, 2018), teachers found value from 'noticing' (Van Es, 2011; Karlsen and Helgevold, 2019) their students during LS. These teachers valued not only opportunities to observe students but also gather their feedback:

> *Well, the students' feedback and their evaluations at the end of the lesson, because that was important. It wasn't what they produced at the end of the lesson, but how they felt about what they did, if that makes sense?* (Billy, p. 4).

Teachers in the highly collaborative History department LS group showed evidence of 'focused noticing' (Karlsen and Helgevold, 2019), in which the needs of particular students and particular events had been critical to new realisations:

> *Even weaker students' writing is often very articulate about their own learning … they were surprisingly using the right sort of language about the progress they were making …* (Billy, p. 5)

They may also have evidenced a more fundamental 'extended noticing' by reflecting on the reciprocal relationship between learning and teaching, involving both teachers and students, such as noted in TC's quote cited on p12, and by Nigel:

> *We made it clear to the students this is … a two-way street, and so they are aware of what it is about … even if a handful of them went, yes I can see you are trying your best and it is still not for me, they can appreciate you have tried* (Nigel, p.3).

The role of the VP

The formalisation of LS through performance management and school improvement agendas were integral to LS in this school. However, despite initiating and funding LS in both departments, the VP had little personal engagement throughout the year:

> *It's* (LS) *got to work both ways, the teachers got to be able to do a bit but the school has to try but it's difficult. I don't know how many times we've said the VP is going to come and watch and then no he couldn't, it's just the nature of the school* (Peter, p. 9).

> *… the biggest constraint on a school is money and time. We can't afford to have any more than two members out of a lesson at any one time … and the VP has said to me he can't justify buying in supply for lesson study* (TC, p. 21-2).

This may have reflected a risk-adverse attitude on behalf of the senior management team, leaving both TC and Peter to trailblaze in a vacuum, promoting and engaging themselves and their colleagues in LS. Whilst the History department negotiated through the VP to bring in HEI support and TC attended TSA LS-related events, neither Peter or Kelly in the English department LS group were guided to such opportunities for support. Not drawing on expertise or facilitation from outside of the group and lack of time to resource collaboration, as experienced by the English department in particular, are factors cited by Mynott's (2017; 2019) research across 5

years in a UK primary school, as likely to highly limit the potential for sustainable teacher learning.

Results indicate that practitioners valued LS as they were able to:

- work as part of a collaborative non-judgemental team
- learn about teaching from experienced practitioners
- generate and share tried and tested resources
- engage fully with students' learning issues through gathering student feedback
- develop practitioner research skills to help raise pupil achievement

For department leaders, both leadership and teaching skills were enhanced through:

- jointly working with departmental staff around lesson planning
- having the support of an HEI academic to learn research skills
- linking LS with targets and performance management
- expanding departmental knowledge about student learning

Across all five teachers, reflections on LS, evidenced that:

- support for LS is not guaranteed from senior leadership, even when driven by this team at the outset
- using LS school-wide could be beneficial but was not planned for
- there are competing priorities for senior leadership
- there are resource implications when funding for projects is not ring-fenced

Discussion

Evidence from this study shows that, despite differences in motivation, engagement and support, LS affirms positive professional relationships and contributes to professional identity development. Confirming larger studies (e.g. Samaranayke et al 2018), all teachers advocated LS's key purpose as teacher learning. This claim is based not on seeking visible evidence of behavioural change (e.g. Lewis et al, 2009) but, rather, through the rich reflective narratives of teachers which offered insights into affective, cognitive and aspects of teacher learning (e.g. Skott and Møller, 2017). Teachers reported LS as a refreshing and stimulating form of JPD, building trust, strong working relationships, professional capacity and 'evidence-based dialogue in

the spirit of inquiry' (Stoll, 2010, p.476). Like Skott and Møller (2017), this study applied a behaviourist-based, theoretical model about professional learning. In this case Illeris' (2011) model could reveal how teachers' inquiry was instigated and sustained, through the creation of space for critical reflection on practice. The discursive spaces LS create allow teachers to show agency by taking responsibility for their actions and making carefully considered choices about refining their practice (Fleet et al., 2017). This study could illuminate how their agency was both constrained and enabled by the contexts of their LS.

Reflection through making tacit practices explicit and offering dissonance to challenge these practices have been evidenced as key factors necessary for professional learning (Mayrhofer, 2019; Mynott, 2017; 2019).

The importance of beyond-LS group contexts was highlighted, as predicted by Skott and Møller (2017). Despite both LS projects being initiated externally as part of nationally-funded TSA projects there was a lack of meaningful support by the senior leadership which saw researching teachers taking responsibility for their own professional learning. The lack of commitment to knowledge-dissemination at a school and TSA level limited the value of the JPD. 'Sharing of results' should be the final key component of collaborative LS (Takahashi & McDougal, 2016; Kullberg et al, 2019; Whitney, 2019). Dissemination was limited to the spaces in which the LS teams had agency. A lack of culture for sharing as an important barrier to LS sustainability concurs with Whitney's (2019) reflections from a USA study.

Conclusion

This study evidenced opportunities and constraints associated with JPD as a mechanism for professional learning through deductively applying a conceptual framework to five teachers' retrospective accounts of engaging in LS. The teachers

reported powerful personal learning experiences, impactful on their practice and relationships with both peers and students. They also expressed frustrations at the lack of school leadership support.

Teachers' accounts challenged Illeris' conceptualisation that learning must have 'content' by demonstrating that they can learn in a third way – emotionally. This is also acknowledged by Kostiainen et al (2018) as needed in conjunction with cognitive dissonance and activation (Mayrhofer, 2019). Through powerful emotional engagement in re-evaluating the values underpinning their practice, teachers could see the value of inquiry as a sustainable form of professional learning. In so doing, LS reaffirmed participating teachers' commitment to the profession, something noted in wider studies of peer observation (Hobson and Maxwell, 2017) - not only for early-career teachers, but more experienced teachers too.

However, school leadership has a key role in providing structural and emotional support for teachers engaging in JPD. A real commitment by the school to work with partner organisations (schools and HEIs) would have allowed its teachers to take up opportunities which existed locally and regionally for sharing emerging expertise about LS as an inquiry process and the findings from cycles of LS inquiry. Where the English education system's rhetoric for developing school-based research is not matched by support, leaders are left without motivation to support inquiry and teachers in a vulnerable position as researching professionals. In the culture of performativity and quick-fix solutions (Lewis et al., 2006; Chun-Ying, 2015), JPD practices such as LS need to be championed.

Recommendations

The evidence in this study supports the following recommendations:

1. The motivated LS researchers, who can be viewed as research champions, can be pivotal to JPD (e.g. Griggs et al, 2016; Lim et al, 2011), but to be effective need not to remain isolated (Mockler & Groundwater-Smith, 2015).

2. Resourcing LS is important to support engagement and knowledge-mobilisation. This might involve funding cover, training opportunities and dissemination opportunities. Not securing and effectively spending funding has also been reported to explain ineffective introduction of LS in other Western contexts, such as the State of Florida (Akiba & Wilkinson, 2016). Prioritising accountability for funding might help school leaders prioritise active support (Gu et al, 2016).

3. Linked to this, teachers called for school leaders to help them manage workload and create spaces for collaboration. They would also value visible support from leaders to observe the inquiry in action. Such architecture for inquiry (Pedder et al, 2015) was also expressed as vital for success of LS in other contexts (e.g. Akiba & Wilkinson, 2016; Lim et al, 2011).

4. Partner HEI academics can fill some of the vacuum between subject departments for the support they would appreciate. It is possible to provide advice directly about teacher research, even without formal structures or remit, but invitation is needed. These academics, rather than school leaders, can become 'boundary spanners' (Wenger, 1998) between the school and external audiences, such as through authoring this paper, trying to keep the conversations and enthusiasm for inquiry alive.

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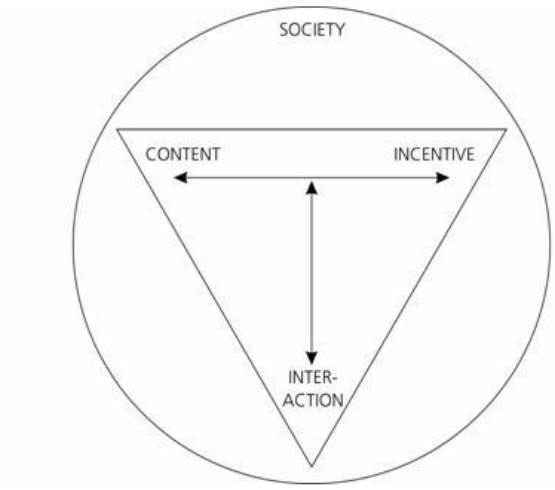
[1] The children in this secondary school were aged 11-16.
[2] Teaching Schools in England and Wales lead groups of linked schools in Teaching School Alliances. Between 2010-2017 ten cohorts of around 800 Teaching Schools had been established.
[3] Teaching Schools have responsibility for ensuring six key elements of school improvement are evidenced, known as the 'Big 6'. These are: School-led initial teacher training, continuing professional development, School to school support, Identifying and developing leadership potential, Specialist Leaders of Education and Research and Development.
[4] The BERA ethical guidance at the time of the study has been revised and reissued as a fourth edition (2018).

Figure 1: Illeris' (2011) three dimensions of learning



Learning dimensions (Knud Illerris)

This is taken from Figure 5.1 p63 from Illeris, K. (2011). The Fundamentals of Workplace Learning: Understanding how people learn in working life. London: Routledge.

Above version available: http://www.te-learning.nl/blog/hoe-we-leren-elearnmooc/

Dimension	Evidence (paraphrased)	Coding and interpretation	
1: Incentive	**Motivation, emotion & volition**	**Energy for Learning**	
Page	*Evidence*	*Sub-code*	*Analysis*
1	Outcome of student interviews discussed in 'safe spaces'	External motivating factor	No one judged
4	Departmental approach to consistency with source questions	External motivating factor	Team approach to focus of research
14	Enjoying this inquiry work to improve exam chances for students	Emotions (positive) External motivating factor	Opportunity to learn with other adults (academics) and teachers
2: Interaction	**Action/participation, communication &/or co-operation**	**Initiating the learning process**	
Page	*Evidence*	*Sub-code*	*Analysis*
6	Report writing for History department	Relationship with colleagues	Opportunity for collaboration with other professionals
11	Observation of students is a key skill	Collaborative research skills	Learning together to collect and use data sources
9	Working with another department to embed SOLO approaches and able to evaluate effectiveness for that subject area	Relationship with colleagues	Building professional confidence
13	Uncovering ethical issues as part of Professional Development session	Relationship with University representative	Taking learning from academia into professional settings
3: Content	**Knowledge, understanding & skills**	**What is learned**	
Page	*Evidence*	*Sub-code*	*Analysis*
3	More able female students find SOLO patronising	Knowledge about students' learning	Listen to student feedback, validate data
10/11	Understanding any form of inquiry requires	Knowledge about practitioner research	Adapting LS to fit a specific context

	a focus and some planning (practical issues e.g. cover, resources)	from experience	

Table 1 Examples of analysis using Illeris' (2011) three dimensions of learning from single interview transcript (Nigel)

Code	Sub-code
Dimension 1: Incentive	
Motivation	Intrinsic motivation (volition) Internal motivating factors Extrinsic motivation External motivating factors
Emotions	Positive or negative
Barriers to motivation/constraints	Lack of time Support/Resources
Dimension 2: Interaction	
Relationships	Relationship quality With colleague With pupils With parents With University representative
Practicalities of participation	Efficiency Timeliness Collaborative research skills
Actions related to outcomes	Cascading to department Cascading to school Constraints related to cascading
Dimension 3: Content	

About practice	Issue (to study) Students and progress data Practice from colleague Teaching strategy Practice from pupils Students' learning Effective practice change Skills/practice change as teacher Skills in planning Skills development as mentor/leader
About research	Knowledge about practitioner research from colleague/experience Knowledge about practitioner research from University partner/representative Knowledge for evaluation (critique) Understanding process of LS Understanding value of LS Understanding limitations of LS Skills as researcher

Table 2 Sub-codes as related to each learning dimension