Lesson Study as a vehicle to foster teacher agency: A systematic literature review

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Abstract

The evidence in support of Lesson Study (LS) as a powerful approach to Teacher Professional learning and Development (PD) continues to grow at a rapid rate. However, despite its widespread use, especially in the area of STEM subjects, researchers have expressed concern that the means by which LS fosters teachers achievement of agency remain under-theorised.With this in mind, this systematic review of literature sought to uncover the mechanisms by which LS may support teachers to become agentic in the context of STEM education. A total of 32 studies are included, drawing from a range of jurisdictions, contexts and subject areas including science, mathematics and STEM. Drawing from an ecological conceptualisation of agency, thematic analysis is conducted on the included studies, leading to the identification of two major themes: Agency enabling factors and agency constraining factors. These themes enable the development of an emergent theoretical framework for LS and teacher agency. Gaps in literature are also identified, most notably, the dearth of literature in relation to agency and LS. In order to ameliorate such gaps, recommendations for further research include the suggested use of the emergent theoretical framework by those engaging in LS as practitioners and facilitators.

Keywords: *Teacher Professional Learning, Teacher agency, STEM Education, Lesson Study.*

1. Introduction

Lesson Study (LS) is a form of school-based professional development, involving an action cycle whereby a group of teachers collaboratively plan, teach, observe and reflect on a research lesson with a group of pupils [1]. Despite evidence in support of LS as a powerful approach to teacher professional learning in multiple and varied contexts, the mechanisms by which LS foster teacher agency remain under-explored [2]. With this is mind, this paper presents findings from a systematic review of literature which sought to explore how LS contributes to teachers' achievement of agency. This review drew from an ecological conceptualisation of teacher agency [3] to examine empirical studies across multiple contexts, in terms of how Lesson Study enhances teacher agency in STEM primary education.

2. Conceptual frameworks
2.1 Teacher Agency

Teacher agency describes the capacity to act with competence, purpose, autonomy and reflexivity in order to bring about positive change within teachers' own practice. According to an ecological model [3], teacher agency is temporal -i.e. constructed based on past knowledge, beliefs and experiences (iterational), enacted in the present (practical-evaluative) and oriented towards the future (projective). Factors which can constrain agency include negative teacher efficacy beliefs, lack of availability of resources (e.g., materials, time) and overly bureaucratic leadership structures [3] while enabling factors include school cultures featuring strong horizontal relationships between colleagues, collegiality and sharing of practice [4]. Such cultures also promote teacher autonomy and professional judgement more broadly than overemphasising accountability and further support teachers' achievement of agency [3,4].

2.2 Lesson Study

The Japanese LS model is a form of school-based collaborative PD [1]. The process is facilitated by an external expert, or Knowledgeable Other (KO) [5]. The role of the KO is similar to that of a coach, whereby they challenge thinking, offer support and guide the group of teachers through the LS cycle. A study of the translation of LS beyond Japan examined the fidelity of various LS interventions in different jurisdictions [6]. This study identified seven critical components which are required in order for a LS intervention to be successful in enhancing teachers' learning:

1. The identification of a broad goal for pupil learning.
2. Teacher planning in collaborative groups drawing on relevant research and resources to create a research lesson.
3. A research lesson taught by one group member and observed by the others.
4. A post-lesson discussion using conversation protocols.
5. Repeated cycles of research using the findings from the post-lesson discussion.
6. The support of an outside expert throughout the process.
7. Opportunities for sharing new knowledge outside the LS group, for example, with other colleagues in their own or in other schools.

For the purpose of this review, these seven critical components of LS are adopted as a conceptual framework in order to examine existing literature on LS.

3. Methodological Approach

Given the focus of the review on teacher agency, a pragmatic epistemological orientation, which sought to ensure that the voices, views and lived experiences of teachers were represented in the selected papers, was adopted. A search protocol was initially devised with terms related to three strands pertaining to LS: "Lesson study" and "agency"; "Lesson study" and "primary" or "elementary" and "Lesson study" and "mathematics" or "science" or "STEM". Further limits were set to refine the search on studies focusing on practicing teachers rather than preservice teachers and academic articles with full text accessible and in English. Limits were also set to include studies from 2000 onwards to focus on the most up-to-date LS research [7]. The search protocol terms were used to create search strings for each area of focus and were then input to the electronic databases of Scopus, Education Source and Web of Science. Manual searches were also conducted in relevant conference proceedings to further ensure that the most current studies had been included. Reference lists from prior reviews were also checked in order to identify older seminal studies [8]. The final stage of study search included the removing of duplicates and screening of the abstracts of the remaining studies to retain only those relevant to the research question.

As the review sought to include studies from qualitative and quantitative domains, a quantitative [9] and a qualitative [10] critical appraisal checklist were adapted and applied to returned studies to methodically examine and assess the validity and relevance of the selected studies' findings. Data on the context, research design and findings, as we all as direct quotes from teachers involved were extracted from those studies (N=32) that scored high in the critical appraisal checklist. The main reasons for exclusion of studies were that they were theoretical in nature, provided insufficient detail regarding the nature of the activities conducted during the LS or were not focusing on teachers' perspective. The extracted data was thematically analysed [11] by deductive and inductive coding of instances where agency was constrained or enabled, as reported by participants.

4. Findings and discussion

A thematic analysis of data was arranged under agency enablers and agency constrainers categories that served as an emergent theoretical framework to explain how LS can contribute to teacher agency. While the research question sought to identify instances of agency enablement in the separate contexts of STEM and the primary setting, the findings from the review showed that the contributing to agency factors were not subject specific, but rather common across multiple contexts in both primary and STEM education.

Agency enablers which were identified during LS activities were categorised as pedagogical content knowledge (PCK), professional community membership and collaborative expertise. PCK describes the unique knowledge of curriculum, pupils and pedagogical strategies which are required for effective teaching. For example, findings from one study noted that "going through complete Lesson Study cycles results in teachers realising and internalising new PCK and beliefs" [12, p.228]. Professional community membership describes the way in which LS helps to create a sociocultural learning space for teachers, where they learn through engaging in critical reflective dialogue. An example of this was evident in findings in another study [13, p.241], where "insulation and isolation" experienced by teachers was ameliorated through engaging with other teachers and KOs in LS. The learning in LS was also attributed to "the constant collegial collaborative interactions between participants and KOs" [14, p.813], which suggests such interactions foster agency under the category of collaborative expertise.

Agency constrainers which were identified during LS activities included lack of resources and a culture of performativity. The lack of resources was related to "the conditions under which lesson study was

conducted, and the lack of educational and school organizational systems set up to support their [teacher participants] efforts" [15, p.277]. This was articulated by a teacher participant in another study who stated "[f]or this model to be successful, you can't just have a few teachers who are like 'Yeah, great, let's do it'. It has to be supported, by the school leadership and by the system" [16, p.509]. In relation to an overemphasis on performativity, the purpose of facilitating engagement in LS in some studies appeared to be to further a performative agenda, rather than on the long-term goal of developing teachers' professional practice to support student learning outcomes. It was stated for example that "[t]eachers were concerned that it should not be a 'quick fix', booster programme targeted cynically at teachers in the year before national testing, but a genuine opportunity for professional learning" [17, p.210]. Similar concerns were expressed in another study [18], which noted participants' association of observation of practice with performance management review, rather than as an approach to deepening teacher learning, as is the case in LS. In the same study it was evident that the attempt was to quantify the impact of LS on short-term gains in student attainment.

A limitation deriving from the agency enabling and constraining factors as described above is that they are broad in nature, and may not be applicable to LS in every context. However, the emergent framework serves in establishing a theoretical connection between agency and LS, which did not previously exist.

5. Implications for practice, policy and future research

The study findings highlight that, despite the scholarly attention LS is receiving, there is a need for further empirical research to examine how LS may contribute to, or indeed constrain, teacher agency in specific contexts, like STEM and/or primary education settings, where such research is lacking.

The systematic analysis of LS literature also enabled the development of an emergent theoretical framework which seeks to make explicit how LS can contribute to teachers' achievement of agency. Due to its theoretical nature, the emergent framework would merit from further application in the field by teacher practitioners, for example, using it to support critical professional reflection on how LS may, or may not, support their achievement of agency. The framework may also be useful for LS facilitators who wish to foster teacher agency as part of their practice and policy makers who may find the framework useful in guiding LS as a PD approach in curricular reforming.

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