Using Lesson Study to Enhance the Quality of Teaching and Learning in Health Professions Education

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Abstract- Lesson study (LS) offers a systematic, but flexible, approach for enhancing the quality of teaching and learning in Health Professions Education (HPE). During LS, teachers collaboratively increase their understanding of their own practice with a variety of stakeholders, including students, subject specialists and education experts. There is increasing global use of LS in primary, secondary and higher education, with studies highlighting its impact on enhancing the quality of both teaching and learning through the professional development of teachers. Despite these benefits of LS, there have been few studies of how LS have been implemented in HPE. The article describes how LS can be practically adapted and implemented in a variety of both academic and clinical settings across the continuum of HPE, from basic to postgraduate and continuing professional education. There is great potential of LS as a method for faculty development in HPE, with both integration into current faculty development programmes and as a continuing professional development activity for teachers across the continuum of HPE.

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Implementing the curriculum to ensure that its intended outcomes are achieved through teaching and learning can be a major challenge for health professions education (HPE) (1). The process of teaching and learning has several inter-related components, including the content, instructional approach and characteristics of the learner, and these components have to be appropriately aligned for effective achievement of intended outcomes. In response to a similar challenge in other fields of education, Lesson Study (LS) has been globally implemented in primary and secondary education, and more recently in higher education (2,3).

Originating in Japan over a century ago, the key feature of LS is that teachers collaborate, typically in groups of three, to increase their understanding of the process of teaching and learning. The focus of LS is how students are learning during one or more specifically selected lessons (4). An important aspect is that these selected lessons provide an essential opportunity for obtaining an in-depth understanding of the process of teaching and learning by using a structured approach of three main phases: planning, delivery and observation, and debriefing and reflection (4).

The collaboration of a variety of stakeholders, including students, teachers, subject specialists and education experts in the structured process, is an important feature of the collaborative approach (4). These discussions between all the participants involved in LS are a powerful influence on how teachers think about how they align the various components that need to be aligned for effective student learning (5,6). A review of the studies conducted in different educational contexts has highlighted that LS has a positive effect on teaching, learning or both (7,8). Teachers were found to have developed their teaching skills with an improvement in their practice and to also engage in studying their own practice and in applying the findings from research into their practice. Importantly, students were found to have increased their understanding of the topics being taught, with an associated improvement in learning outcomes.

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Despite the widespread implementation of LS, we are only aware of four studies of LS in HPE (9-12). All of the studies noted positive benefit for teachers, with a shared reflective approach to practice and improved instructional design and implementation, and also improved student learning outcomes in topics that included applied clinical anatomy and information literacy.

In this article we provide practical recommendations on how to adapt and implement LS into HPE. We consider that LS has great potential as a method for faculty development in HPE, with both integration into current faculty development programmes and as a continuing professional development activity for teachers across the continuum of HPE, in both academic and clinical settings. Our recommendations are based on our personal experiences of adapting and implementing LS for both faculty development and as a continuing professional development activity for teachers. One of the authors (DA) has several years' experience of implementing LS for the continuing professional development of secondary school teachers and also as the main instructional approach for an initial teacher training programme. Recently both authors have collaborated in adapting and implementing LS for both faculty development and individual and collective continuing professional development for teachers in HPE, including academic and clinical contexts. The recommendations are also informed by advice from several widely cited published best practice guides and key research studies across the different fields of education, including HPE, which were identified by a rapid literature review.

The phases and stages of lesson study

Phase 1: Planning

Stage 1 in this phase is the identification of the goal for the specifically selected lesson. The focus should be an area of concern about how students are learning and achieving the intended outcome of teaching, with the goal of improving teaching and learning related to this focus. In Stage 2, the content and activities for delivering the lesson are planned. The literature on LS recommends that this phase may require several meetings to both refine the area of concern and to plan an approach for overcoming the concern (6,13,14). These meetings can be a powerful professional development opportunity due to the collaborative discussions (15).

Phase 2: Delivery and observation

In this phase, Stage 3 occurs with the collection of information from a variety of stakeholders, including observers and selected students.

Phase 3: Debriefing and reflection

An essential aspect of this phase is Stage 4, with a discussion after the research lesson, which may be led by a facilitator and/or subject specialists and education experts. This process is a valuable professional development opportunity with increased individual and collective understanding of how their teaching influences learning. Following this stage, during Stage 5, there is an opportunity to consider the future delivery of teaching but also cycles of LS can be implemented, with the iterative development of new teaching content and activities for improving the quality of teaching and enhancing student learning.

Using a systematic process also provides an ideal opportunity to create a variety of different products that can be used as evidence of scholarship. For example, in Phase 1, the discussion may highlight the need to conduct a literature review to inform planning, and the whole process can be presented as a case study, perhaps for a poster, conference presentation or journal article.

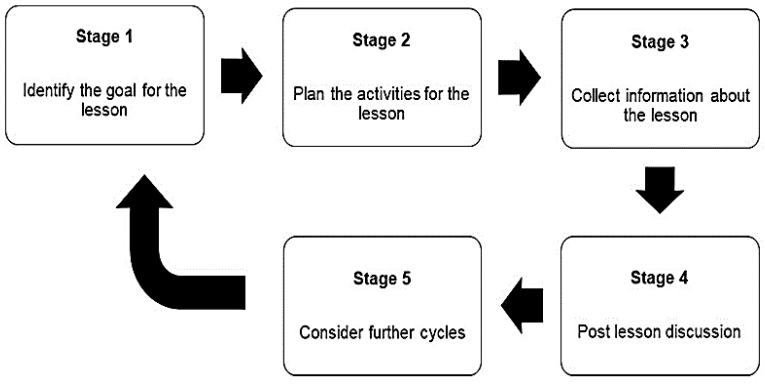

Figure 1. Stages of LS

Recommendations for using lesson study

Recommendation 1: Use a systematic process for LS

The use of a systematic process for LS is important since the maximum benefits are influenced by careful attention to all the phases and stages (4). The essential feature of LS is the development of greater understanding by teachers of how the learning of students is influenced by their actions, with the new insights informing their future teaching (4). Important aspects of this understanding are the influence of the individual attributes of the teacher (such as motivation, knowledge, skills and beliefs), the interactions between the teacher and learner, and the learning environment (3,4).

Recommendation 2: Develop a collaborative team for LS

A collaborative team is essential for LS, with all members having a clear shared purpose of how to enhance student learning through teaching (16). The literature on LS emphasizes the importance of co-creating an understanding of the variety of factors that can enable and constrain learning during one or more lessons, and this occurs by discussions between several different stakeholders, including teachers and students (17). In a typical LS, three teachers are involved, with one delivering the teaching for the lesson and two participating as observers (4). Students are also often included in LS (4). In addition, subject specialists and education experts may be invited to become integral members of the team and the team may also be led by a facilitator.

Hervas (11) and we have become aware of some of the challenges for developing a collaborative team, such as the development of mutual trust and the commitment to regular meetings between the members. However, these challenges are no different to other team situations and we have adopted well-recognized approaches, such as negotiating protected time with managers, discussing expectations, and establishing ground rules before commencing any activities. An important challenge is the engagement of students for the whole process, and we have found that an effective approach is to ask for volunteers and to explain the benefit of LS to all the students in the group, which is the enhancement of their learning experience and outcomes. An incentive may be offered to the students, such as a certificate of participation, that can be used in their professional development portfolio.

Recommendation 3: Collaboratively identify the goal for the lesson

The goal of the lesson should be on understanding the factors that enable and constrain a student's learning about a specific topic. For example, the difficulty could be academic, such as understanding the importance of the social determinants of health in proving healthcare, or clinical, such as the insertion of a venous cannula. The difficulties can be identified from several sources, including informal teacher and student evaluations of teaching and learning, but also more objective measures of student learning, such as assessment marks.

An important aspect of Stage 1 is to increase the focus of the goal (15). This focus can be the development of the students' knowledge, skills and/or attitudes, or the main factors that influence learning, such as the key motivational, cognitive, metacognitive and self-regulatory, and social/environmental factors. An increased focus provides a specific area of interest when planning the lesson and the collection of information. For example, the collaborative team discussions may highlight the need to enhance student acquisition of knowledge. The teaching through the activities of the lesson can subsequently focus on this aspect and learning can be assessed by collecting information about the extent of the acquisition of knowledge, such as by a using a problem-solving task or discussion. Observation and discussion between the team members can focus on the factors that enable and constrain the learning, including the key regulation and social/environmental factors (18).

Recommendation 4: Collaboratively plan the activities for the lesson

The research lesson can be planned in Stage 2 by collaboratively discussing an existing lesson to consider what activities delivered in the lesson appear to enable and constrain the students' learning. This discussion can focus on questions about the aims of the lesson and their alignment with the chosen methods, with the discussion identifying that these methods need to be modified before further delivery. The literature on LS highlights the importance of this stage (15), with collaborative detailed planning of the lesson activities. Important planning questions are:

What is the main concept or concepts that the teacher wants the students to understand?

Why is this concept or concepts important to understand?

What understanding of the concept do the students have at the time of your teaching?

How will the topic be taught (what are the teaching techniques)?

What resources will be used to explain the topic?

How will students be engaged in the topic?

How can the students' understanding of the topic be checked?

How can transfer of knowledge be encouraged?

How can the learning of the students be assessed during the lesson?

The discussion can be augmented over several meetings by conducting a literature review and/or discussion with subject specialists and education experts as well as collaborative reading of key texts, such as using effective teaching strategies for learning–for example, the development of cognitive skills (19) and metacognitive and self-regulatory skills (20) as well as the overall design of lessons, such as Gagne's nine events of instruction (21) or Peyton's clinical skill development approach (22).

Recommendation 5: Collaboratively collect information about the lesson

The focus of collecting information during the delivery of teaching in Stage 3 is on understanding the factors that enable and constrain learning during a lesson, with multiple perspectives to develop greater understanding (15). This requires the team to have specific goals for the lesson, such as a focus on specific knowledge or skills that the student is expected to develop, and then to collect information so that the team can identify from both the teachers' and students' perspectives the extent to which the knowledge or skills have been developed, and also what factors in the lesson have enabled and constrained this development.

In a typical LS, two teachers collect information from two or three selected students but the teacher delivering the lesson can also provide useful since they will have their own thoughts (4). Similar to a research study, it is essential to align the choice of methods to the aim and the context, including the available resources and the audience. The main methods used by the teachers are the observation of the reactions and behaviours of the selected students during the lesson, especially noting the timing in relation to specific activities in the lesson, but also any influences by other students and the environment. The intentions and actions of the teacher delivering the lesson can also be noted by the teacher, as can the students' reactions and behaviours during the lesson.

The collection of information is usually informal and at small scale, such as the observing teachers making short notes annotated with the times of specific events of interest (15). However, the main information collection method for both teachers and students are often the memory of experiences which can then be recalled during Stage 4. These pragmatic methods are designed to ensure that the workload on each member is low but sufficient to provide important insights for the discussion in Stage 4 to occur immediately, or soon after, the lesson. More formal approaches for collecting information can be used, such as the use of video and observation checklists for group interaction or qualitative interviews of participants, along with more rigorous analysis to enable publication standards required by some journals or conference presentations, if this is an intended output of the LS.

Recommendation 6: The importance of multiple perspectives about the lesson

Obtaining multiple perspectives during the lesson increases the opportunity to obtain answers to the questions related to the goal for the lesson, especially the need to better understand the factors that enable and constrain learning. The two teachers acting as observers of the lesson can have a different focus of attention (15). For example, the selection of students may be purposive with one teacher having a focus on observing the behaviour of a high-achieving student and the other teacher on a low-achieving student. Also, one teacher may focus on a specific student and the other on the learning environment. Obtaining information from the selected students provides another essential perspective in addition to the teacher and there may be additional perspectives from subject specialists and education experts (23).

Recommendation 7: The importance of collaborative post-lesson discussion

Debriefing provides an essential reflective aspect of LS and occurs in Stage 4, where an important feature is the collaborative nature of the debriefing. Group discussion is used to share and analyse the experiences, reactions, and insights about teaching and learning that each individual has observed during the lesson (24). Similar to Stage 2, the discussion can be augmented by discussion with subject and education experts as well as from key texts, such as books or journal articles. This "exploratory talk' is a powerful professional development opportunity for teachers, leading to greater understanding of their values as a teacher but also the skills required for effective delivery of teaching (11,25). In addition, during

Stage 5, there is an opportunity to make a quality improvement action plan for changes in their future delivery of teaching, with a direct focus on attempting to enhance the learning of students.

Typical questions that stimulate the discussion about the teaching and learning are listed below (6):

What did students typically know about the topic when they came to the lesson?

What did students typically struggle with when they were performing the learning task?

What were the advantages of the teaching techniques used in the lesson?

To what extent did the students understand the topic?

What changes should be made for future teaching of the topic?

Recommendation 8: The importance of iterative cycles for LS

An important aspect of Stage 5 is consideration of further specific lessons with the iterative development of new teaching content and activities (4). Although this is an important quality improvement approach for enhancing both teaching and learning, it is also an important opportunity for professional development as a teacher. During iterative cycles of LS, teachers can challenge their assumptions about teaching and learning but also refine their knowledge and skills as a teacher. This double-loop learning is also essential for the long-term improvement and culture change that is often required for changing teaching and learning in HPE (26). Japanese schools engaging in LS often continue to explore specific themes over a year or more, with each iteration identifying new goals for the next lesson and making modifications to the teaching to ensure that there is maximum enhancement of the learning of students (15). This more prolonged approach also provides an opportunity for each member of the three teachers to both deliver and observe teaching.

Recommendation 9: Consider the support of experts and a facilitator

The contribution of subject specialists, with detailed understanding of the topic, and education experts, with specialist knowledge on teaching and learning, in all of the stages of LS can offer additional perspectives and inform discussions about how students are learning, as well as on the associated enabling and constraining factors (15,27,28). These specialists and experts may be available from many institutions, both in higher education (including medical schools) and from healthcare providers. The multi-disciplinary and collaborative approach can also be extended by including colleagues from basic and applied biosciences, other health professions (such as nursing and social work) or from different specialties in medicine, such as primary care and psychiatry.

A facilitator with experience of implementing LS can provide support throughout all the stages of LS and research has highlighted that this is an important aspect of effective implementation (29). The main benefit of a facilitator is that they can challenge all stakeholders involved in the research lesson to consider their underlying assumptions about teaching and learning. This process requires the development of an appropriate non-judgmental, but critical, team for LS, especially since teachers may have deeply held beliefs about their teaching (11). Although facilitators with specific expertise in LS are unlikely to be present in medical education, medical schools will have experienced small group facilitators and there may also be contacts within educational departments in the same higher education institution with expertise in facilitating LS (11).

Recommendation 10: Be flexible in the use of LS

The great value of LS is that it can offer a highly flexible approach that can be adapted to local needs and contexts (4,15). For example, there could be only one teacher as observer, or the planning phase could have several teams delivering the same topic for teaching. Also, there are various combinations for involving students in LS, such as all students participating in all the phases or smaller, different groups in each of the phases. This flexibility allows potential implementation across a wide variety of academic and clinical settings, including simulation, and across the continuum of medical education, from basic to postgraduate training to continuing professional development.

Recommendation 11: The importance of whole institution implementation of LS

Increasingly the importance of whole-institution culture change has been recognised in HPE, especially since this education is provided across several diverse academic and clinical settings, with teaching occurring in a range of different environments, with different topics, different challenges on delivering content and different subject and education expertise in teachers (1). The implementation of LS requires a ‘top down’ organisational commitment to using this approach for both the professional development of teachers and for

contributing to the overall quality improvement of teaching and learning to enhance students' learning. However, 'bottom up' approaches by enthusiastic teams of teachers and students can begin the more organic growth across an institution, especially if LS can be adapted to the needs and resources of the local situation (4).

Recommendation 12: Consider the challenges of implementing LS

The main limitation of implementing LS is the time commitment required of all participants who often have busy academic and clinical workloads. Institutional 'buy in' is important, with allocation of protected time for LS, but it may be possible to integrate LS within existing approaches for professional development of teaching in HPE, such as peer review of teaching, and across specific areas of the programme which are a high priority for action to improve the quality of teaching and learning.

From our experience, an important barrier to the implementation of LS is that many of the components are considered by potential users as being similar to existing approaches for the professional development of teachers and the quality improvement of teaching and learning. For example, peer review of learning, with direct observation of teaching, has been widely implemented in medical education (30), but this usually has a focus on teaching by one teacher with observation by another teacher. However, in LS there is an emphasis on using a collaborative team approach with iterative cycles to understand and enhance student learning through a structured and collaborative approach with a variety of stakeholders, including students and subject specialists and education experts (15). In this way, knowledge is generated through the synthesis of the experiences of all the stakeholders.

There may be barriers to implementation of LS in HPE due to the increasing demands by institutions for teachers to evidence their scholarship through research into teaching and learning, such as that required for retention and promotion (31). However, the structured approach of LS, with a series of clearly defined stages, can provide an appropriate opportunity to collaborate and develop academic outputs, such as literature reviews and case studies that can be presented more widely to communities of educators at conferences or published in peer-reviewed journals.

LS provides a well-established approach for enhancing the quality of teaching and learning in primary, secondary and, to some extent, higher education. There is great potential using LS in HPE since it offers a structured, but flexible, approach that can be easily adapted and implemented as a method of faculty development in HPE, with both integration into current faculty development programmes and as a continuing professional development activity for teachers across the continuum of HPE, in both academic and clinical settings across the continuum of medical education.

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