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What is Lesson Study?

Lesson study is a model of professional development which supports teacher learning through collaboration. Lesson study consists of a cycle of phases, where a group of teachers work together to plan, conduct, observe and reflect on a research lesson. Through these phases, teachers share their knowledge and experience and have opportunity to collaboratively identify, trial and reflect on new practices. By participating in lesson study, teachers become researchers of their own practice through their investigation of innovative pedagogical approaches, with careful consideration of pupil learning. Teachers who have participated in lesson study have noted positive changes in their classroom practices and in their collaborations with colleagues. Research has also indicated that participation in lesson study has the potential to positively impact pupil learning, develop teacher knowledge and build teacher community (Lewis & Perry, 2017; Ni Shuilleabhain & Seery, 2017; Lieberman, 2009).

“It improving something as complex and culturally embedded as teaching requires the efforts of all the players, including students, parents and politicians. But teachers must be the primary driving force behind change. They are best positioned to understand the problems that pupil face and to generate possible solutions.”

(Stigler & Hiebert, 1999/2009, p. 135)

It is important to note that lesson study is not about creating the best and most successful lesson (although it may be a very welcome outcome of the practice), but rather provides teachers with opportunity to collaboratively explore teaching and learning through the design, conduct and reflection of a research lesson.

It is hoped that participating in lesson study will provide teachers with opportunities to:
1. Access and explore curriculum objectives in detail
2. Reflect on long-term goals for their pupils
3. Carefully consider the learning outcomes of a strand, content area, unit and research lesson
4. Study the best available international lessons and ideas
5. Plan a research lesson that identifies and achieves carefully defined learning outcomes
6. Deepen subject matter and pedagogical content knowledge
7. Develop pedagogical skills
8. Build capacity for collegiate learning
9. Develop a focus on pupil thinking and engagement
10. Implement the Primary School Mathematics Curriculum (DES, 1999) in an environment intended by the curriculum

A Problem-Solving Approach to Teaching and Learning Mathematics

The Primary School Mathematics Curriculum (DES, 1999) encourages teachers to incorporate a problem-solving approach to teaching mathematics. In this approach, students are encouraged to work independently on a problem and then share their strategies as part of a whole class discussion. The teacher acts as a facilitator of learning - guiding pupils to construct meaning and focusing on the mathematical reasoning of a solution, thereby developing their communication and problem-solving skills. The teacher concludes the research lesson by drawing pupils’ shared strategies together and summarising the learning from the research lesson. This approach contributes to developing a classroom learning community and to fostering a growth mindset towards mathematics.
Lesson Study Cycle

A lesson study cycle follows five basic phases (see Figure 1), which are further described below. Teachers collectively participate in each phase, with one teacher conducting the research lesson and other members of the team observing pupil learning in that lesson.

Working with the PDST, teachers are asked to complete a brief reflective journal at each stage of the lesson study cycle (see Appendices). This allows teachers to record thoughts and insights about their learning, which will be beneficial for the ‘Shared Lesson Study Day’.

![Lesson Study Cycle Diagram]

**Figure 1: Lesson Study Cycle (Ni Shuilleabhain, 2015)**

### 1. Study Curriculum and Formulate Goals

During the first stage, teachers formulate a goal for their participation in lesson study and study the curriculum to decide on what topic to consider for the cycle.

The following agenda is suggested for the first meeting:

i. Choose roles for the initial meeting of the group (e.g. facilitator, time keeper, note taker, etc.)
ii. Examine ideas about professional development and lesson study
iii. Consider and formulate a long-term goal for the group (see questions below to guide you)
iv. Build a proposed timeline for the lesson study cycle
v. Review the curriculum and areas which may be of interest for the cycle – these should be areas that you feel are difficult to teach or that pupils often have difficulty in learning
vi. Review key decisions and/or insights made during the meeting
vii. Agree upon tasks to be completed or followed up in the next meeting.
Note: The facilitator’s role involves planning, guiding and managing the group discussion to ensure that the group’s objectives are met, with clear thinking and equal participation from those involved in the process. The facilitator also steps back from their own personal views in order to focus on getting the best from group members and to enable them to reach a successful decision, solution or conclusion. It is the role of the facilitator to ensure that conversations generally revolve around the aims of each phase of the lesson study cycle.

Sample Prompts for Facilitator
- What do we need/want to achieve in this session?
- What do we need to do to accomplish this?
- What do we need to do first/next?
- How does this align with our long-term goal?
- How will this help to answer our research question?
- Are we agreed on this action?

Devising your long-term goal
The long-term goal should provide you with a broad teaching and learning goal to keep in mind during the lesson study cycle. The goal should also go beyond a particular class-group, but is not something that you would necessarily expect to achieve during one cycle.

In considering and formulating a long-term goal, you may wish to ask:
  A. What is the gap between the ideal and the actual for your practice? What would you like to work on as a teacher?
  B. Think about your pupils. What qualities would you like them to have in 5 or 10 years from now?
  C. What qualities do they have now and what could be improved upon?

An example long-term goal may be:
“For pupils to find purpose and meaning in their mathematics which leads to their enjoyment of the subject.” (Ni Shuilleabhain, 2015)

2. Plan Content
Planning the research lesson should take place over a number of meetings. For each of your planning meetings, choose roles to ensure that there is a facilitator, note taker(s) and time-keeper. For each meeting, the following steps are suggested. These steps need not be adhered to in a linear way, but may be outlined and re-visited through collaborative conversations.
  i. Choose roles for the planning meeting
  ii. Decide on the class group and curriculum area on which to focus
  iii. Consider a research question for the cycle
  iv. Select or revise the research lesson
  v. Write a teaching and learning plan based on agreed upon and specified learning outcomes
  vi. Devise an observation strategy for collecting data within the research lesson to answer the research question
  vii. Review key decisions and/or insights made during the meeting

Agree upon assignments to be completed or followed up in the next meeting (note here that the majority of work should occur during planning meetings and it is not advised that individuals undertake too much additional work outside of the lesson study meetings).
Considering a research question

Your research question should be considered as relevant to your research lesson and something which could, potentially, be answered in your conduction and observation of the research lesson.

“How can we design a lesson so that pupils are supported in identifying patterns?”

or

“How is pupils’ reasoning of adding two two-digit numbers supported with the use of counting blocks?”

Writing a teaching and learning plan

In commencing the teaching and learning plan teachers should ask themselves (Lewis & Hurd, 2011):

1. What do pupils currently understand about this topic?
2. What do we want them to understand at the end of the unit or sequence of lessons?
3. What is the sequence of experiences (lessons) that will propel pupils toward the learning outcome? (i.e. the learning trajectory)
4. Which lesson in the unit will be selected as the research lesson? (i.e. Is the research lesson an introductory lesson to a topic or does it come three lessons later?)
5. What will make the lesson(s) motivating and meaningful to pupils?
6. What will pupils need to know before this research lesson?
7. What will they learn during this research lesson?
8. What is the sequence of experience through which they will learn it?
9. How will pupils respond to the questions and activities in the research lesson?
10. What problems and misconceptions will arise and how will teachers respond to them?
11. What evidence should we gather and discuss about pupil learning, motivation, and behavior?
12. What data collection forms are needed to do this?

The planning process begins with reviewing relevant research articles, teaching and learning materials, curricula or other available resources which provide insight into pupil learning and inform planning.

When a plan has been outlined, agreed upon tasks should be sourced or designed to align with the learning objectives of the research lesson. Each teacher should independently do the task intended for pupils and, as there will usually be a variety of strategies employed within a group attempting a task, each teacher should have an opportunity to share their solution strategies. It will be important to anticipate and discuss the successes and difficulties the pupils may encounter within the research lesson and discuss how the conducting teacher will respond to pupils within the research lesson.

‘Productive struggle’ is an important part of learning and can be carefully planned for (Schoenfeld, 2014). By anticipating pupils’ responses, teachers have opportunity to think about what kind of struggles and misconceptions may be an intentional element of the research lesson. It is important to discuss and plan responses and strategies that might facilitate pupil learning as these struggles and misconceptions emerge during the research lesson.
The teaching and learning plan should include:

- The group’s long-term goal.
- The research question.
- The learning outcomes for the research lesson.
- The rationale for this research lesson.
- Where the research lesson relates to the curriculum.
- How pupils learning will develop preceding and following the research lesson.
- Anticipated pupil thinking related to tasks and activities within the research lesson.
- Anticipated teacher responses.
- Scripted teacher questions to identify pupil learning during the research lesson.
- A data collection plan for observing teachers.
A suggested format for the research lesson plan may be:

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<th>Research lesson title:</th>
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<th>How pupil learning will be assessed:</th>
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Devising an observation schedule

It is very important for teachers to consider what data will answer their research question and how data will be collected during the research lesson.

In designing an observation schedule (or plan), teachers might like to consider:

1. What data will illustrate pupils’ progress on the research lesson goals and long-term goals?
2. What pupil work (if any) will be collected at the end of the research lesson?
3. How will material that is presented on the board or elsewhere be captured? (photographs etc.)
4. Will one person transcribe the research lesson and keep a timeline of lesson events?
5. Will observers be assigned to observe specific pupils or groups?

Observing teachers should choose specific behaviours or actions to focus on during the research lesson and note their observations on an observation template. These, along with sample of pupils’ work, will inform the Shared Lesson Study Day.

Observers may wish to:

1. Make notes on individual pupil comments and conversations, noting the names of pupils
2. Note situations in which pupils are collaborating or choosing not to collaborate
3. Look for examples of how pupils construct understanding through their discussions and activities
4. Document the variety of methods that individual pupils use to solve problems, including errors.

Note: It may be useful for observing teachers to have both a copy of the research lesson plan and seating map of the room with pupils’ names during the lesson.

3. Conduct and Observe Research Lesson

Teaching the Research Lesson

The teacher conducting the research lesson should follow the planned lesson, unless their formative assessment of pupils’ learning requires them to make alterations. The teacher may introduce the class to the observers, but otherwise should not interact with observing colleagues during the research lesson. The conducting teacher should not be chosen until the research lesson plan is almost finalised, but this may not be possible in all schools.

Observing the Research Lesson

It is important that observing teachers understand their role as data generators, collecting information on the research lesson to discuss within the reflection meeting. Therefore, all conversations with colleagues should be minimised and teachers should not engage with pupils during the research lesson.

Recommendations for observing teachers:

- Remain in the room during the entire lesson to capture the lesson set up, flow, and conclusion.
- Do not block the pupils’ view during the lesson.
- Circulate freely during individual/group work but move to the back/front during whole class discussions.
- Minimise interactions with pupils and refrain from teaching or assisting the pupils. Occasional interaction is permissible, if done discreetly and with the sole purpose of understanding pupil thinking.
4. Reflect on Research Lesson

Reflection Meeting

The reflection meeting is an opportunity for the group to share their observations and thoughts on the research lesson and to conclude on their learning from the cycle. The meeting should be held as soon as possible after the lesson and, once more, roles should be chosen for participating teachers.

The following schedule is suggested for the meeting:

i. The teacher who conducted the research lesson should first share their reflections of the lesson.
ii. Observing teachers should share data and reflections from the research lesson. These contributions should relate to the research question or long-term goal of the lesson.
iii. All members of the group can use the data generated within the research lesson to highlight pupil learning, lesson design and any broader issues in the teaching & learning.
iv. All members of the group can consider any changes that should or should not be made to the teaching and learning plan and decide whether or not to teach this revised plan or embark on a new cycle (in the case of the former, another reflection meeting should be held following the revised research lesson).

v. The group should review key decisions or insights made during the research lesson.
vi. The group should agree upon assignments to be completed or followed up in the next meeting.
vii. The group should take the opportunity to share their successes in completing a lesson study cycle!

Possible prompt questions for reflecting on the research lesson:

1. Was the pupils’ prior knowledge adequately judged in planning?
2. What did pupils learn during the lesson?
3. Did the sequence of experiences and tasks work during the lesson? Why/Why not?
4. How did the pupils respond to the questions/activities in the lesson?
5. What problems and misconceptions arose?
6. What did the data collected tell us about pupil learning, motivation and behaviour?
7. Was there ‘productive struggle’ in this lesson?
8. Did this lesson support us in addressing our long-term goal?
9. How have we answered our research question?

5. Revise and Reteach (optional)

Revisions are now made to the lesson based on the reflection stage. The research lesson should now be re-taught with different pupils. The cycle of observation, discussion and revision is repeated if necessary.

Prompt questions for reteaching the lesson might include:

1. What do the pupils need to know before we reteach the lesson?
2. Do we need to deepen our own understanding before reteaching the lesson? E.g. readings, etc.
3. How will we reteach the lesson to address the problems and misconceptions that arose?
4. How can we reteach the lesson in a way that further addresses our long-term goal?
5. Do we need to make any changes to the timing of the lesson?
6. What changes if any are needed to the activities/materials used? Are they essential for learning?
7. Are amendments necessary to the scripted teacher questions?
8. Do we need to edit our observation schedule? Why/Why not?
9. Will these changes help us to answer our research question in more depth?
Reflective Journal

A reflective journal allows one to record thoughts and insights about one’s own learning experience. Teachers are asked to reflect on their experience as a whole, with a particular focus on facilitating the process, observations on teacher collaboration and individual learning.

Prompts for reflective journal entries may include:

**New Learning:**
- What skills/knowledge did you gain/strengthen during this stage of the lesson study cycle?
- What insights did this new knowledge give me?
- How do I think this might be useful in my teaching?

**Personal Reaction:**
- How did I feel about this stage of the Lesson Study Cycle?
- What did I enjoy/find challenging and why?
- How did you deal with problems you encountered during this stage of the lesson study cycle?

**Action Taken:**
- Is there any action that I will take as a result of this meeting?
- Do I need to do further research?

1. Study Curriculum and Formulate Goals

**New Learning:**
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**Personal Reaction:**
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**Action Taken:**
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# Reflective Journal

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## 3. Conduct and Observe Research Lesson

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4. Reflect on Research Lesson

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5. Revise and Reteach (Optional)

New Learning:

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Personal Reaction:

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References


Acknowledgement

This booklet was written by the PDST in conjunction with Dr Aoibhinn Ní Shúilleabhaín, University College Dublin, School of Mathematics & Statistics.