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TEACHING FOR MASTERY LESSON STUDY TOOLKIT SECTION 3:

PARTICIPATING IN LESSON STUDY

Information and guidance for anyone participating in a lesson study group

Teaching for Mastery
Lesson Study Toolkit

Section 3:
Participating in Lesson Study

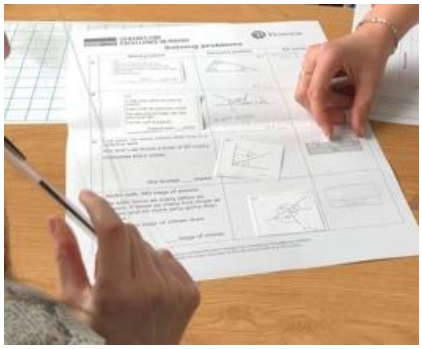
Information and guidance for anyone participating in a lesson study group.

CONTENTS

PARTICIPATING IN LESSON STUDY

This section of the CfEM Lesson Study toolkit is for everyone participating in a Lesson Study Group.

It provides background information and also very practical advice about what you need to know in order to participate effectively.



Before digging into this section of the toolkit you might want to take a look at these pages/tools from section 1 of the toolkit. This will provide you with some background information that you might find useful:

- Overview of Lesson Study **(section 1.1)**
- Lesson Study as professional development **(section 1.3)**
- Lesson study as collaborative lesson research **(section 1.4)**

3.1 RESEARCH THEME AND QUESTIONS

In lesson study around the world teachers come together to engage in lesson study. Central to this work is collaborative lesson research. That is, collaboration between teachers, and others involved in supporting teaching and learning, in which the aim is to improve learners' learning experiences and outcomes.

In doing so, teachers aim to change aspects of their classroom practice, both as individuals, and also has a collective.

Research Theme

It is important that lesson study efforts are directed carefully within an overarching theme - such as Teaching for Mastery, which was the focus of the Research Trials within the CfEM programme.

This theme will set the direction of all lesson study activity over a substantial period. For this reason, it is important that group agrees on the theme and has a shared understanding of what they mean by something like Teaching for Mastery. If Teaching for Mastery is considered as an example, the first thing to do is to explore exactly what might be meant by this. During the CfEM research trials the Centres collaboratively came to an agreement of key principles that were applicable and research/evidence informed. These were carefully documented and exemplified. See the Teaching for Mastery Handbook that sets out the Key Principles. In this way all teacher participants in the research were able to make sure that they had a shared understanding of the issues that they would explore in the research lessons. These principles were important in developing the exemplar lessons and their accompanying research questions.

Research Questions

The research lesson in Lesson Study explores a 'professional' or research question that the group seeks to answer. Consequently, the research question(s) relate very directly to important incidents that are planned for in the lesson. For example, if the group is exploring students' use of different representations in their solution to a problem, the lesson needs to be planned in ways that encourage such representation development. The lesson plan for the research lesson should be considerably more extensive than would be the case for a day-to-day lesson. It needs, for example, to signal to the class teacher (and observers) where opportunities to 'answer' the research questions are planned for, and to indicate what the planning team expect to happen and how the teacher might be expected to deal with what they expect students to do in response to the task(s).

3.2 THE RESEARCH LESSON PLAN

"*The Japanese term for the document created for a research lesson is gakushushido-an (学習指導案), which is usually translated as "lesson plan". ....we prefer the phrase "lesson proposal", because the document is much larger and broader in scope than what is usually meant by "lesson plan". Also, the word "plan" may imply a fixed script, but in Japanese Lesson Study the teacher is expected to use his or her judgment if students respond in unanticipated ways.*"

Fujii, T. (2016). Designing and adapting tasks in lesson planning: a critical process of Lesson Study. *ZDM Mathematics Education, 48*(4). doi:10.1007/s11858-016-0770-3.

The quote above from an expert in Japanese Lesson Study draws attention to how the plan for a research lesson is more than a brief lesson plan. this is because it seeks to answer a specific question or questions that the Lesson Study group have in relation to their teaching and students' learning. It should have been developed in relation to an overarching research theme that is guiding the work of the group.

Typically, a research lesson plan/proposal includes:

1. A clear indication of the unit of work that the lesson is part of with references to the curriculum specification and/or scheme of work.
2. Unit objectives.
3. Details of the overarching research theme.
4. The focus of this lesson in relation to prior and subsequent learning.
5. A brief overview of the characteristics of the group of students.
6. Research question(s) for the lesson.
7. Plan for the research lesson.

The lesson plans that were used as part of the CfEM randomised controlled trials can be found here. These may give you a sense of the level of detail that should be aimed for.

These lessons were used effectively as part of a series of seven lesson study cycles as part of the full trial intervention. These lessons were found to be more effective in improving student learning when used as part of a cycle of lesson study research lessons than when taught by teachers individually. The collaborative professional learning of lesson study facilitates improved classroom teaching and student learning.

Research questions

The research question(s) guide the planning of the lesson. The lesson ultimately should allow the group to answer the question.
In the CfEM Teaching for Mastery Trials each lesson had two questions. One was focused on the mathematics of the lesson and the other was more general and focused on pedagogy. For example, the research questions for a lesson about multiplicative reasoning had these two questions:

Pedagogic focus
How is the lesson developed and brought to a close in ways that values and builds upon what students already know?

Maths focus
What evidence do you observe of students' prior learning about multiplicative reasoning and how do they work with or modify this?

Research questions might typically start with phrases such as:

How can we …
Under what conditions …
What is the best way to …
Will it make a difference to ….
What strategies …
What can we do to … so that …

3.3 PLANNING MEETINGS

The research lesson is not just any old lesson, it is a lesson that is carefully designed to allow the group to explore a question that they have identified that is important to their teaching within the overall focus of the research theme that informs all of their work.

The advice below is particularly important for the person coordinating the group.

Planning Meeting 1

1. In this meeting, welcome everyone and remind them of the timescale of the process.

2. There are two main aspects to this meeting:
   - Identifying the research focus of the lesson
   - Selecting a suitable main task for the lesson

3. Once you have identified the task(s) that you are going to use, it is very important that every member of the planning team does the task(s) themselves, attempting to think as a student might. If there is not time to do this during the planning meeting it could be set as "homework" for participants, (See below).

   You also need to consider the structure of the lesson. Make sure that students are not always doing short pieces of work on their own. If you want to be able to gain better understanding of their thinking during the lesson it is best if there are opportunities for students to work in pairs or small groups where there are opportunities for students to discuss their mathematical thinking and understanding with each other.

4. It is a good idea to try out the task on a different class - not the one that you are planning to use for the research lesson. Ideally, several members of the planning team might be able to do this and report back next time. Doing this makes it much easier to move on with the planning in the second planning meeting, where anticipating what students will do is central.

5. Make sure everyone has each other's contact details and set a date and time for the next planning meeting, if you haven't already done so.

Homework (between planning meetings 1 and 2)

Work through the task and anticipate student responses.
Think about:

- What different representations might students use? (Physical? Diagrammatic? Symbolic?)
- Will they be able to work on a solution using techniques within the reach of *your* students?
- Can some students use a more sophisticated method?
- Is there a really elegant approach?

Approach the task from the students' point of view.
Think about:

- How will my students respond to the task?
- What variety of approaches do I expect?
- What difficulties will they encounter?
- How will I recognise that students are making progress during the lesson?

Anticipate students' responses in detail, listing them, and planning questions for the teacher to ask or actions to take. This will mean that the lesson plan will soon grow very much beyond what teachers normally have time to do.

Planning meeting 2

This meeting should prioritise bringing everyone's thinking together.
Depending on numbers we have found it useful to designate a small number of people, two or at most three, to write the actual plan. If there are more teachers involved in the Lesson Study group this meeting can draw on their wider thinking and this can be reflected in the final plan written by the smaller team. It is probably best if the small team includes the teacher who will teach the research lesson that everyone will attend.

Use this meeting to:

- Finalise the lesson task. Consider if it needs tweaking in any way - particularly taking into account the students who will be taught in the research lesson.
- Think carefully about the lesson structure.
- Identify, and think carefully about the wording of, the research questions for the lesson.

The writing team can now go away and finalise the plan.

Planning meeting 3

By this meeting you should have a close to ready research lesson plan. The purpose of this meeting is to share this plan with the Lesson Study group and think carefully about its suitability. It is important that you build on all of the work that has been done in getting to this stage but do take a critical look at all aspects of the plan and particularly make sure that the person who is going to teach the lesson is happy with the plan and thinks that it will work for his/her class.

Make sure that the teacher who will teach the research lesson is supported by the whole team as much as possible (for example they may help with getting resources ready for the lesson). The whole team should have ownership of the lesson.

3.4 PRE-LESSON BRIEFING

It is helpful to have a briefing for everyone who attends the research lesson. This can be on the day of the research lesson. It is helpful to allow 30 minutes for this.

This briefing usually involves the following:

Introduction to the college and practical matters

The host of the group from the college should make sure that arrangements for the research lesson, are clear (e.g., how long it will last, any restrictions on taking photographs of students' work and so on).
In addition they should point out anything that observers should know about the class and anything about any individual students (such as their sensitivity about being observed and so on on).

It is also important for the class teacher to point out anything that has been specifically changed in the lesson to cater for the students in the class.

Everyone should be reminded of the research question for the lesson.

Advice for the observers

Make sure that everyone is clear about how they should behave during the research lesson. They should:

- Observe student learning, not judge the teaching.
- Focus on observations that may help address the research question(s).

- Avoid distracting students by talking to them or interacting with them in any other way (apart from maybe saying hello and being overtly friendly at the start of the lesson).
  (This is important because if an observer, for example, helps a student or group of students during the lesson, it interferes with the reality of teaching the actual lesson. The intention is to research how the lesson works when taught by an individual teacher)
- Make detailed notes about specific examples of student learning (for example their written work, discussions in pairs, and so on) so that they can contribute to the post-lesson discussion.
- Observers might find it useful to focus on only one group or pair of students to start with. This can be used to provide valuable insight during the post-lesson discussion after the lesson. It is very unusual to get detailed evidence of students' reactions during a lesson.

Some lesson study observers around the world have enjoyed recording their observations using Lesson Note on an iPad.

3.5 OBSERVING THE RESEARCH LESSON

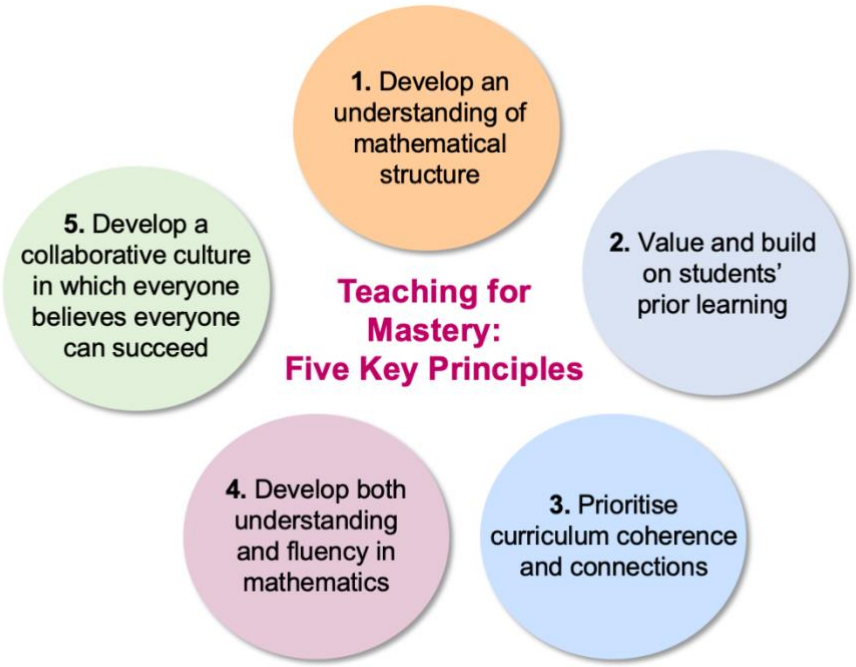
The observers of the research lesson have the job of collecting evidence that will inform the group to answer the research question in the post-lesson discussion.

Observers might find it useful to use an observation form such as the example here.

Questions they might like to think about ...

- How did students respond to the task(s) used in the lesson?
- How did students respond to the teachers' questioning?
- What anticipated and unanticipated reasoning was in evidence?
- What representations (concrete, pictorial, abstract) did students use to help them engage with the mathematics
- What progression in student reasoning was in evidence?
- What different approaches were observed?
- Did students engage with the reasoning of other students?
- Did students recognise when their approach was not working?
- How were students' own ideas combined and developed?
- To what extent were learning objectives achieved?
- Where in the lesson could you point to evidence of the key principles of Teaching for Mastery?

In the CfEM Teaching for Mastery Trials the lesson study groups in the full intervention of the randomised controlled trial were guided by the five key principles in the diagram below. These helped guide the framing of the research questions that in turn informed the participating teachers' observations. An overarching question that a Lesson Study group can consider is in what ways do they expect to see students engaging with mathematics that would be a good outcome of their lesson design principles?



3.6 POST-LESSON DISCUSSION

Here is some advice for the person coordinating the post-lesson discussion.

Where?
Ideally the post-lesson discussion can be held in the same classroom as the research lesson, so that participants can use student work or refer to materials used in the lesson.

Duration?
About an hour has been found to be a productive length of time for a discussion. However, if everyone is still actively engaged and enjoying the discussion, and it is possible, you may find it beneficial to go on longer. The person chairing the post-lesson discussion will need to use their judgment and take the advice of the hosting teacher who may have other lessons to teach. This is a good reason why it might be helpful to have the research lesson as the last lesson of the day.

Introducing the discussion (for the chair of the session)

- Begin by reminding everyone of the research focus of the lesson. Try to keep discussion focused on this.
- Ensure that everyone has copies of the lesson plan and any observation notes they have taken.
- Give the teacher an opportunity to talk about their own perceptions of the lesson and any reasons they had for deviations from the lesson plan in response to student learning during the research lesson.
- Ask for *brief-but-vivid* accounts of critical incidents, encouraging participants to *describe* what they saw, rather than attempting to account for why. This keeps the discussion open to alternative explanations and avoids premature closure.
- Discourage participants from making evaluative judgments about "what went well", or otherwise. Each point made should refer to evidence seen in the lesson. At this stage it may be that participants refer to their own experience of teaching the same lesson with their students if they have been able to do so.

Structuring the rest of the discussion
Following this introductory phase there are many possible ways of continuing the post-lesson discussion:

- *Plenary throughout.* This way, everyone hears everything that everyone says, but with a large number of observers this can be time-consuming. Keeping everyone focused on the research question helps.

- *Think-pair-share.* Participants could have a few minutes to think individually and write down their thoughts (perhaps on post-it notes) before sharing with another participant. This could be a helpful prelude to plenary discussion.

- *Group discussions.* One possible way of proceeding is to divide into small groups to explore different aspects of the research question, perhaps collecting thoughts on a flipchart or poster, and then reconvening to share what has emerged.

Concluding with the view of an outside expert
The post-lesson discussion could conclude with an extended input from an outside expert.

It may be that you can involve an outside 'expert' in Teaching for Mastery. They can help by providing a fresh outsider view and can suggest possible directions for the lesson study group by building on what has been learned. They should seek to draw together the threads of the discussion and make particularly pertinent remarks relating to the research question and how the group might move forwards.

3.7 HERE WE GO AGAIN

Lesson Study is an ongoing, sustained and challenging mode of professional development. Working within a specific research theme the Lesson Study group should aim to carry out cycles of research lessons that probe particular issues that all lie within that theme.

For example, in the CfEM research trials the overarching theme was Teaching for Mastery. The research lessons all investigated Teaching for Mastery, but they focused on different aspects of this. A number of initial meetings were held that identified five key principles and these helped us focus on different ways of Teaching for Mastery in each of the research lessons. These principles guided our thinking about what a lesson might look like and helped us not only think about how we wanted students to work with the maths but also the lesson structure that we adopted for all of the research lessons. (This included sections of the lesson focussed on exploring, discussing and reviewing, for example).
The Handbook setting out the key principles can be found here.

What we aim for in Lesson Study are ongoing cycles that build individual teacher and community knowledge.

After each research lesson the group needs to consider what has been learned in that particular lesson, in relation to the research theme, and what it will do next, building on this learning.

Make sure that your group consider this at the end of each cycle so that the next cycle can be as effective as possible.

Questions to consider:

- How many Lesson Study cycles will you have in a year?
- What are the key areas that you will explore in the theme that guides your work?
- In what order should you work through your questions?
- How will you draw your work together and communicate your findings?

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