

Appendix A: LS Facilitator Guide

Summary of timeline:

- Week 1:** Establishment of group norms and the generation of student development and equity research themes
- Week 2:** Study and plan phase for lesson topic of Week 3
- Week 3:** Teach and reflect phases for Week 3
- Week 4:** Study and plan phase for lesson topic in Week 5
- Week 5:** Teach and reflect phases for Week 5
- Week 6:** Study and plan phase for lesson topic in Week 7
- Week 7:** Teach and reflect phases for Week 7
Reflect on entire LS process

(5-week term will only complete two lesson study cycles)

Week 1

Key Activities:

- 1.1 Identifying group norms
- 1.2 Identifying research themes
- 1.3 Introduction of weekly reflections

1.1 IDENTIFYING GROUP NORMS

In-meeting activity (10 min)

Purpose of assignment: Enable individuals the opportunity to idealize their lesson study experience and their team.

Instructions: Create one Google slide in which you drop in images, quotes, and words that represent your expectations for participating in this professional development. Be sure to include a representation of some characteristics of the kind of team you want to be a part of.

As you make this slide, think about the following questions: (Stepanek et al., 2007)

1. What are your expectations for how we will work together?
2. What conditions will contribute to our learning and growth as instructors?
3. What conditions do you expect will get in the way?
4. What strategies should we use to resolve differences and disagreements?

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Once you have finished making your slide, please write about your slide in the “notes” section. Describe why you chose these images, quotes, and words to represent your expectations of the professional development and of the team.

Have each member share out.

In-meeting activity (15 min)

Purpose of activity: Lesson study creates a community in which everybody has expertise that will make this successful. Thus, it is important to create and maintain these norms in order for everyone to feel comfortable and valued for sharing their knowledge and expertise.

Instructions: Present list of effective group norms as described in the literature:

Example #1 (Lewis, 2002b)

- Communicate clearly and listen carefully.
- Respect the views of others.
- Share your views willingly.
- Ask and welcome questions for clarification.
- Be open to the ideas and views presented.
- Honor time limits.
- Stay on task.

Example #2 (Stepanek et al., 2007)

- Communication is open and honest.
- There is a climate of trust.
- Members are encouraged to both challenge and support one another.
- When resolving conflict, members must agree to listen and focus on the problem rather than on the people involved, give adequate processing time, and try to see the issue from the other person’s perspective
- Mistakes are viewed as opportunities.
- Members are held accountable for their actions, thus members should be committed to fulfilling their responsibilities, dividing the workload, and respectively supporting each other.

Group discussion prompts:

- Is there something you had on here that you suggested in your slide?
- Is there something not on here that you would like to add?

Synthesizing our discussion:

- Create a Google doc with a list of our norms and expectations

Concluding points:

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- **Egalitarian discussion** (Lewis, 2002b): This professional development may operate differently from other opportunities that you've had. I want to emphasize that every individual in this group has something valuable to contribute to the process and study. After all, you all have once been students and you all are continuing to learn.
- **Emphasis on students, not teachers** (Lewis, 2002b): Reminder that as we move forward, though we are instructors of the students and are meeting together, this opportunity is not a critique of you and your practices. We are together trying to learn more about how students learn the material.

1.2 IDENTIFYING RESEARCH THEMES

In-meeting activity (25 min)

Purpose of activity: A research theme, or sometimes called a research focus or a main aim of the lesson study, is a broad, long-term goal that instructors wish for their students. A *student development theme* refers to the goal that instructors may have for students regarding their development as learners in higher education. Some examples include “building a desire to learn” or “developing independent thinkers.” An *equity theme* refers to the goal that instructors may have for students addressing equal opportunities for access and success. Some examples include “building a sense of agency in their career path” or “validating their STEM identity.”

Instructions: Present departmental mission statement of the instructional team.

Individual reflection then whole group discussion prompts:

- After reading this document, what are the parts you feel are most important or most interesting?
- From your own experiences, what part of the mission statement do you think needs the most improvement?

Instructions: Have a “brainstorming” Google Doc that everyone can contribute to in order to document the ideas from the discussion. Start to formulate possible research themes.

Individual reflection then whole group discussion prompts:

Think about a class of students that you have recently taught. Or perhaps from your own experiences when being a student and your classmates around you.

- What are the resources that students have and bring to the course?
- What can we, as instructors, do to elevate these assets to support and help develop these students towards the goals we have identified?

Synthesizing our discussion:

- Develop the LS research themes and document it in the brainstorm document
- Collect thoughts on if every team member agrees with the final theme

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1.3 INTRODUCTION OF WEEKLY REFLECTIONS

In-meeting activity (10 min)

Purpose of activity: The purpose of these weekly reflections is to allow you space to critically think about your experience and development throughout this process. The weekly reflection will give you space to do a “brain dump” where you can express how you feel and any thoughts you may have had about the activities we engaged in during the meeting. Additionally, this will give you the opportunity to individually let me know if you felt like you were heard or if you perceived ample opportunities to contribute to the process. This will help me better understand what I can do to support and maintain the norms each meeting. After each meeting, take about 5-10 minutes to complete this reflection. You will be compensated for this additional time outside of the meeting.

Instructions: Present form for weekly reflection. Facilitate a discussion to raise and answer any questions and address expectations.

Week 2, Week 4, Week 6

Key Activities:

- 2.1 Studying the lesson
- 2.2 Considering student-centered teaching strategies
- 2.3 Planning the lesson

2.1 STUDYING THE LESSON

In-meeting activity (30 min)

Purpose of activity: Lesson study is not about re-inventing the wheel, rather it is about designing effective instruction for our own students. Considering how you were taught the content topic or how you first taught the topic is a good starting point.

If first study phase:

Display the following terms:

- Alternative conceptions
- Partial understandings
- Misconceptions

Individual reflection prompt then whole group discussion:

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- What is the meaning of each word?
- Are there any similarities or differences between each term?
- What do each of these words imply?

Display the Teacher Noticing Framework (Jacobs et al., 2010)

- Attending to students' strategies
- Interpreting students' understandings
- Deciding how to respond on the basis of students' understanding

Individual reflection then whole group discussion prompts:

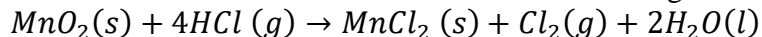
Reflect on your time as student first learning about [topic], or your first time teaching [topic]:

- Were there certain concepts or constructs that were confusing or difficult to grasp? What were they?
- Why do you think they were confusing or difficult to grasp?

Instructions: Facilitator provides a multi-step problem that integrates several concepts from the topic. Ask the team to individually complete the problem. Then, purposefully give a reasonable incorrect answer (where the incorrect answer reflects that of a partial understanding or misconception of a concept). Ask the team to consider how the student may have approached the problem.

Example below for limiting reagents lab:

The following reaction is used to obtain small amounts of chlorine gas in the laboratory:



If 28.0 g of MnO_2 are allowed to react with 42.0 g of HCl , what is the limiting reactant?

Incorrect student answer: MnO_2

2.2 CONSIDERING STUDENT-CENTERED TEACHING STRATEGIES

Engage in the following section if this is your team's first study phase

Purpose of activity: Lesson study emphasizes the ideas and the perspectives of the students. It is important for instructors to create opportunities for students to express these ideas and perspectives then use these to respond and push the lesson forward.

Instructions: Facilitator gives brief overview of teacher discourse moves and its importance in engaging students in the construction, justification, and evaluation of knowledge rather than the dissemination of facial knowledge. Examples of discourse patterns:

- IRE (Initiate-Response-Evaluate)
- IRF (Initiate-Response-Feedback)

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Introduce the CDOP (Classroom Discourse Observation Protocol) coding scheme (Kranzfelder et al., 2019).

Individual activity: Provide the following document [Getting Started With Active Learning](#). Identify 2-3 teaching strategies from this document that you may want to implement in the lesson. Record your ideas in the “Brainstorm” Google Doc and how you might adopt the strategy for this lesson.

Whole group discussion: Share findings in whole group.

2.3 PLANNING THE LESSON

Whole group discussion: Based on our discussion of student thinking about [topic], how might we go about introducing the topic to the students?

Facilitator reminds the team of their research themes.

Questions to consider:

- What kinds of questions and experiences do students have entering this lesson? How can these be sequenced or leveraged to bring students to where we want them to be when they leave?
- Who has access to participating in these activities? Who does not?
- How will students respond to the questions or activities we pose? How will we respond to them?
- What will make this lesson motivating and meaningful to students? What assumptions are we making about the students?

Week 3, Week 5, Week 7

Key Activities:

- 3.1 Preparation for the observation
- 3.2 Debrief of observation
- 3.3 Reflection on lesson

3.1 PREPARATION FOR THE OBSERVATION

Pre-meeting activity (to be done by facilitator)

Purpose of activity: Given the importance of having a live classroom at the center of the Lesson Study but also recognizing the constraint of one-hour per week meetings with the team, it is

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necessary that the teaching/observation phase is scaffolded to produce meaningful discussion and reflection.

Instructions: To prepare for the observation, the TA of study that week will tell facilitator what 5-10 minute clip was most salient to them during their teaching. The facilitator will cut the clip for view in the meeting.

Additionally, based on the clip, the facilitator will create an observation guide for Lesson Study participants to fill out when viewing the clip. It will resemble the following observation tool used by the Lesson Study Consortium:

Ex. of Student Development Theme: Students will be able to develop and value their own as well as their peers' perspectives

Ex. of Equity Theme: Students will exercise their scientific agency to ask questions, make observations, and make claims about the content and how it relates to their own lives

Ex. of Observation Guide:

Approximate Time	Learning Task	Point to note regarding student development theme	Point to note regarding equity theme	CDOP codes noted	Observer notes	Wonderings
Ex. 0:00-5:00	Students just finished a simulation of separating mixtures of compounds. TA is facilitating a discussion around the common conflation between distillation and evaporation.	How are students interacting, challenging, or building off of others' ideas?	What conditions or opportunities were created for students to relate the material to their lives?	Contextualizing-- "Instructor asks students to connect ideas to conventional knowledge, border perspective, and personal experiences"	TA asked verbally and no student was speaking up. Then TA invited students to use chat generating more responses that the TA read out loud.	What strategies can facilitate peer-peer discussion rather than having it be filtered through the TA?

3.2 DEBRIEF OF OBSERVATION

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In-meeting activity (20 minutes)

Purpose of activity: The debrief of the lesson gives team members the opportunity to reflect on their own conjectures about student thinking and deepen their understanding about teaching, learning, and instructional design.

Flow of discussion:

- GTA who taught the lesson comments on a) their reasoning for choosing this specific clip, b) their general impressions of how it went and how they felt, c) what they think went well, d) any difficulties or challenges they experienced in the lesson
- Watch the video clip (and re-watch, pause, rewind as needed)
- Participants fill out the observation sheet
- Team members share their observations and ground their comments in the observation and the evidence
 - Discussion about student development theme
 - Discussion about equity theme

Synthesizing our discussion:

- Summarize the key ideas and questions that emerged from the debriefing

3.3 REFLECTION ON LESSON

In-meeting activity (40 minutes)

Purpose of activity: By analyzing what we observed in the teaching clip, we can gather evidence to measure if the lesson achieved the goals we set. The evidence will also provide insight as to which aspects of the lesson plan need to be reconsidered.

Whole-group discussion prompt:

Question Set #1 (focused on the lesson recording) (Stepanek et al., 2007)

1. Describe your observations of student learning. Include details of what students said, did, and wrote/produced.
2. Were there any unanticipated student responses?
3. To what extent were the goals of the lesson achieved? What evidence from the teaching clip supports your claim?
4. Which instructional decisions (from our lesson plan or on-the-spot) might have contributed to helping students meet these goals?
5. What aspects of the goals were not achieved?
6. Which aspects of the lesson should be reconsidered based on this evidence?

Question Set #2 (focused on takeaways and future instruction)

1. What are some ideas that we want to takeaway for future instruction?

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2. Based on our discussion, what specific ideas and strategies do we want to try and implement in our next lesson?

Final Week

Key Activities:

- F.1 Reflection on Lesson Study process

F.1 REFLECTION ON LESSON STUDY PROCESS

In-meeting activity (60 minutes)

Purpose of activity: This reflection will serve as a way to discuss and celebrate all that we have accomplished throughout the term. We will critically reflect on what aspects of lesson study were useful or challenging and how these instances and experiences shaped the way we think about teaching, learning, equity, and our students.

Instructions for individual activity: Create one Google slide in which you drop in images, quotes, and words that represent your experiences and accomplishments while participating in this lesson study cycle.

Whole group discussion: Let everyone have the opportunity to present their slide to the team.

Discussion prompts:

- What is useful or valuable about our lesson study work together?
- What other professional development opportunities have you participated in? How is lesson study similar or different to those opportunities?
- How has lesson study prompted you to think about the practice of teaching? About how students learn? About equity in the classroom? About instructional design?
- What was challenging about participating in lesson study?
- Is there anything else that you would like to discuss that we haven't yet touched on?

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