

Collaborative Learning Pedagogy and Content Analysis Training

AUTUMN 2025 SYLLABUS

Key Information

- **Instructor:** Subhadip Chowdhury (he/him), subhadip@uchicago.edu, Eckhart 120B
- **Graduate TAs:**
 - Polina Baron, pbaron@uchicago.edu
 - Iris Li, yunxuan@uchicago.edu

Pedagogy Training	Friday	10:30 am-11:20 am	Kent 106
		1:30 pm-2:20 pm	Ryerson 177
Content Analysis Training	Monday	1:30 pm-3:20 pm	Eckhart 117
		4:00 pm-5:50 pm	Eckhart 117

Training Program Description and Learning Goals

The training program is designed to support undergraduate Lead Junior Tutors and graduate Teaching Assistants in the Collaborative Learning Tutorial program, which supplements the Elementary Functions and Calculus (Math 131-132-133) sequence in the Mathematics Department. **Collaborative Learning** is a highly structured form of group work based on the POGIL (Process Oriented Guided Inquiry Learning) model. During the Orientation Week meetings, we will describe its key features and how it differs from “traditional” group work.

Our goal is to use collaborative practices to deepen students’ conceptual understanding of the course material, enhancing their performance in homework, exams, and problem-solving in general. As a Lead Junior Tutor, you will facilitate the process by leading small teams of students as they analyze supplemental problem sets written by the Instructional Faculty, designed explicitly for enhanced team interaction.

The training program aims to provide a formal education in evidence-based collaborative learning pedagogies through supportive supervision and to discuss their practical implementation in the context of the Math 130s sequence. Participants will also review the weekly problem set and discuss it through the pedagogical lens of a collaborative learning facilitator.

Learning Goals for the Autumn Quarter

By the end of the first quarter, participants will be able to:

- Apply a Purpose-Process-Product method to address classroom challenges effectively.
- Identify the behaviors and attitudes necessary for promoting a safe learning environment and successful academic teamwork.
- Implement multiple roles that are instrumental for productive small-group learning interactions.
- Refine observation skills to recognize student behaviors as evidence of learning.
- Facilitate small group activities and engaging presentations that enhance student learning.
- Design appropriate leading and follow-up questions that promote conceptual understanding and improve metacognition.

Components of the Program

Orientation Week Boot Camp

Collaborative Learning Orientation Boot Camp	Saturday, Sep 27	2-5:30 pm
	Sunday, Sep 28	2-5:30 pm

Before the weekly training starts, LJTs will attend a two-day Collaborative Learning Orientation Boot Camp on Saturday and Sunday before the Autumn Quarter begins. This orientation will introduce the fundamental theoretical principles of collaborative learning, including constructivist learning theory, Bloom's taxonomy, and cognitive load theory. Additionally, the orientation will explain the details of the Math department tutorial program and the roles of a Graduate Teaching Assistant or Lead Junior Tutor within this framework, ensuring participants feel prepared and confident in their responsibilities.

The sessions will be recorded, and the slides will be available for new LJTs joining in future quarters.

Weekly Training Meetings

Pedagogy Training

Each week, we will meet to discuss the challenges and successes of the Collaborative Learning tutorial sessions. We will also explore the pedagogical philosophy that drives collaborative learning and develop the skills needed to effectively facilitate CL tutorials.

To prepare for the weekly pedagogical training session, the Lead Junior Tutors will need to:

- Submit a reflective journal entry after their Collaborative Learning tutorials.
- Submit any assigned observation report (e.g., peer feedback, time management sheet, strategy analyst notes, etc.) for the week.
- Update student attendance/participation records in CANVAS.
- Read and reflect upon any assigned reading that provides the foundation for the week's pedagogical topic.

During the pedagogy meeting, participants should actively engage in discussions by sharing ideas and listening to others. The notes and slides from the meetings will be posted on Canvas within a day.

Content Analysis Training

During the problem set analysis training, participants will review the upcoming week's tutorial problem set from their students' perspectives. We will

- Identify the learning goals for the problems and classify them into appropriate levels of Bloom's taxonomy or the Cognitive demand framework with proper justification.
- Identify the background knowledge a student needs to begin working on the problems, and develop some probing questions we can ask to verify whether the student has that prior knowledge (beyond just asking if they have covered it in class).
- Identify possible misconceptions or sticking points a student might have while working through the problems. and design some leading questions we can ask to help them with it.
- Design at least two questions that we can ask to ensure a student has fully understood the main learning goals of the problems.
 - These should be short and metacognitive questions that can be used to highlight the main takeaway.
 - One of the questions should be something that can be used to slow down students who are going too fast with a superficial understanding and ensure they spend time fully exploring an idea.

Feedback/Assessment

- The Lead Junior Tutors will be observed by the GTAs or the instructor. You will be scored based on a rubric and provided with written feedback about your performance. The rubric will be available on Canvas.
- You will receive feedback from your peers, who will submit observation reports towards the end of the quarter. You will not be assessed based on their feedback; rather, the goal is to improve your ability to provide objective feedback.
- After the end of the quarter, you will receive feedback from the students through a survey.

Attendance/Credit

There are no credits or grades associated with the training. Since this is an important part of a Lead Junior Tutor's job responsibilities, participants are expected to attend all weekly training workshops and complete their weekly journal reflections.

If you think you'll miss an upcoming training session, please let me know as soon as possible. To make up for the absence, you'll need to do some extra reading or journaling and have a check-in meeting with me before your next tutorial.

Failure to attend or adequately make up the absences for multiple training workshops each quarter will be reported to the co-directors of Undergraduate Studies in the Math department and may impact salary and rehiring decisions.

Planned Content for the First Quarter

Orientation Week - Active Practice & The First Tutorial

During the second day of the orientation week boot camp, LJTs will practice facilitating segments of the first Collaborative Learning tutorial. LJTs will learn to

- establish their authority in the classroom, convey tutorial expectations and policies,
- motivate students to engage in this non-traditional classroom format, and
- institute standard classroom procedures. These include assigning small groups and roles within the groups, facilitating discussions without providing answers, and guiding group presentations.

Week 1 – 3P Framework & The Manager role

In our first training session, LJTs will reflect on the challenges and successes reported in their written reflections from the first week's tutorial. Through guided mentorship, participants will learn to apply the 3P method (Purpose, Process, Product) to address classroom challenges effectively. The two most common challenges identified in the reflections will be selected, and LJTs will create a 3P solution to implement during their next training workshop. Typically, the most common challenge is the lack of equitable student-to-student collaboration among team members, so this session will focus on defining and identifying how the Manager role can be utilized to foster a more balanced and productive group dynamic.

Week 2 - Supporting Claims with Student Behaviors as Evidence

This week, LJT's will improve their ability to observe and document student behavior as evidence of learning. The session will start with some sample case studies, where participants will practice identifying key behaviors that show student understanding. Through a Think-Pair-Share activity, LJT's will compare observations with peers to better distinguish evidence from analysis.

Next, as a preparation for the next week, Lead Junior Tutors will split into groups to discuss the purpose of the Strategy Analyst role and the kind of content that should be included in a strategy analyst sheet.

Finally, participants will sign up for peer observations (to be completed by week 7), where they will fill out forms focused on documenting evidence and analysis, thereby strengthening their ability to gather valuable insights for improving tutorial effectiveness.

Week 3 - Metacognition and Strategy Analysis I

We will begin by discussing what makes a good minute paper question and how refining it can help gather useful feedback. Then, they will review the strategy analysis sheet submitted last week and talk about how to create Strategy Analyst sheets that support student metacognition. As a task for the next training session, they will be asked to document how they engage with the audience during presentations.

Week 4 - Strategy Analyst II and Authority in the Classroom

Week 5 - Effective Presentations & The Spokesperson Role

During this training workshop, Lead Junior Tutors will brainstorm and identify behavioral evidence of engaging presentations that improve student learning. The session will focus on specific actions that Lead Junior Tutors can use to facilitate more engaging and effective presentations, emphasizing the presentation of general, transferable problem-solving strategies rather than specific solution steps. Participants will develop a 3P plan to enhance the presentation segment of the tutorials.

Week 6 - Operant Conditioning

We will review the challenges and successes reported in the weekly reflections. LJT's will be introduced to classical conditioning and the four quadrants of operant conditioning, which provide a framework for reinforcing and increasing desired student behaviors, as well as decreasing undesired

behaviors. LJT's will then analyze various classroom scenarios and potential facilitator responses. They will identify which quadrant of operant conditioning is being used to meet classroom learning goals and assess how these responses affect students' attitudes. LJT's will be asked to reflect on and report a situation from their own classroom.

Week 7 - Catch-Up and Journal Debrief

Using observations from the journal reflections, we will try to identify common challenges and brainstorm solutions to address these issues.

Week 8 - Facilitating Discussion by Asking Effective Questions

Lead Junior Tutors will discuss how to design effective questions that promote meaningful discussion. We will explore how to anticipate potential student responses, address incorrect responses, implement strategies when students do not respond, and handle unexpected questions from students. Finally, we will examine the purpose and benefits of Wait Time to enhance classroom interactions.

Week 9 - Learning from Observing Each Other

We will discuss end-of-quarter planning and administrative details, including attendance records and soliciting student evaluations and feedback. Lead Junior Tutors will evaluate what they learned about their leadership strategies through peer observation and reflect on the quarter, identifying key areas for improvement to address next quarter.