Collaborative Learning Pedagogy and Content Analysis Training

WINTER 2026 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	Ry 253A
		1:30 pm-2:20 pm	E 202
Content Analysis Training	Monday	1:30 pm-3:20 pm	E 117
		4:00 pm-5:50 pm	E 117

Training Program Description and Learning Goals

The training program supports undergraduate Lead Junior Tutors (LJTs) and graduate Teaching Assistants (TAs) in the Collaborative Learning (CL) Tutorial program, which supplements the Elementary Functions and Calculus (Math 131-132-133) sequence in the Department of Mathematics. CL is a highly structured form of group work grounded in Process-Oriented Guided Inquiry Learning (POGIL): students work in small, self-managed teams on guided-inquiry materials, with clearly defined roles and an emphasis on both content learning and process skills (communication, teamwork, and metacognition).

Our shared goal is to use collaborative practices to deepen students' conceptual understanding, improve their ability to reason, communicate, and solve problems independently, and enhance their performance on homework and exams. As a Lead Junior Tutor, you will facilitate the process by supporting productive team interactions, pressing for justification and sense-making, and guiding student presentations without turning CL into content delivery.

Winter Quarter Focus. Building on Autumn's foundations (roles, norms, questioning, and basic facilitation), Winter training emphasizes (1) selecting and adapting tasks to be both mathematically meaningful and "group-worthy," (2) maintaining high cognitive demand during implementation,

and (3) promoting equitable participation through concrete facilitation moves and reflective improvement cycles.

Learning Goals for the Winter Quarter

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

- **Analyze and classify** tasks using a cognitive demand framework and justify classifications with evidence from the task prompts and expected student thinking.
- **Adapt tasks to be group-worthy** by designing multiple entry points, multiple abilities/contributions, and positive interdependence.
- **Maintain cognitive demand in the room** by using facilitation moves that support productive struggle (probing, pressing for meaning, revoicing, "tell me why," and strategic wait time) rather than reducing tasks to procedures.
- **Orchestrate student presentations/discussions** using a shared routine to foreground student thinking and connect strategies to key mathematical ideas.
- **Promote equitable participation** by recognizing and responding to status dynamics, using multiple-abilities framing and elevating overlooked contributions, and structuring role use/rotation to broaden who gets to do high-status mathematical work.
- **Set and track a S.M.A.R.T. instructional goal** tied to observable tutorial behaviors, and use peer/instructor feedback to revise practice over the quarter.
- Improve their management (planning, organizing, directing, coordinating) skills for more effective collaboration during the tutorials.
- **Use Perry's Scheme** to interpret students' beliefs about learning and certainty (e.g., "there's one right answer" vs. "we justify choices"), and choose facilitation prompts that move students toward reasoning, evidence, and metacognitive self-checking.

Components of the Program

Weekly Training Meetings

Pedagogy Training

Each week, we will debrief tutorial challenges/successes and develop facilitation skills that strengthen student-to-student collaboration and conceptual learning. To prepare for the weekly pedagogical training session, the Lead Junior Tutors will need to:

- Submit a reflective journal entry after their CL tutorials.
- Submit any assigned observation artifact for the week.
- Update student attendance/participation records in Canvas.

- Complete any assigned reading and a brief reflection.

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 content analysis, participants will examine the upcoming week's tutorial problem set from students' perspectives and prepare to facilitate it effectively. Each week we will:

- Identify the learning goals for the problems and classify them into appropriate levels of the Cognitive Demand Framework with proper justification.
- Identify prerequisite knowledge and write diagnostic probing questions.
- Anticipate misconceptions/sticking points and draft leading questions that preserve cognitive demand (avoid converting tasks into procedures).
- Plan for presentations and whole-class synthesis using a shared routine (anticipate-monitor-select-sequence-connect), as needed.
- Design at least two short metacognitive "takeaway" questions, including one that slows down superficial speed.

Evidence & Feedback Cycle (Winter-specific component)

To support deliberate improvement, each LJT will maintain one S.M.A.R.T. instructional goal for the quarter and collect light evidence of progress (e.g., a short observation form, talk-move tally, role-rotation notes). Peer visits and instructor/GTA observations will be used to provide feedback aligned with this goal.

Onboarding Requirement for LJTs New to the Program

Any LJT employed during the Winter quarter who did not complete the Autumn quarter training and/or the Orientation Week training is required to complete the following additional onboarding steps:

1. Complete a minimum of six hours of self-paced onboarding in Canvas (recorded training videos and assigned readings). This onboarding is self-assessed; LJTs are expected to engage actively and come prepared to discuss the content.
2. Meet with the tutorial coordinator during Week 1 to discuss the onboarding content and complete any required follow-up tasks.
3. Observe one tutorial led by an experienced LJT (assigned by the coordinator) continuing from the previous quarter and submit a peer observation report by the end of Week 2.

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

This training carries no academic credit or grade. It is a required component of the Lead Junior Tutor appointment, and participants are expected to attend all scheduled training meetings and complete the associated weekly reflections and submissions.

If you anticipate missing a session, notify me as soon as possible (ideally at least a week before the meeting). If you are ill, please prioritize your health and avoid attending in person. Communicate promptly so we can arrange a makeup plan.

Make-up work (required for any absence):
To make up a missed training session, you must complete:

1. The assigned reading/viewing and a short written reflection, and
2. A brief check-in with me (online or over email) before your next tutorial, and
3. Any missed weekly administrative items within the week.

Repeated missed trainings (or failure to complete make-up requirements) will be documented and reported to the co-directors of Undergraduate Studies in the Math department and may affect continued appointment or reappointment decisions (e.g., probation or non-renewal).

Planned Content for the Winter Quarter

Week 1 – Debrief + SMART Goals + Winter reset

We will debrief key patterns from Autumn tutorials and re-establish shared expectations for roles, norms, and facilitation. Each LJT will set one S.M.A.R.T. goal for the quarter, along with observable indicators and a plan for collecting evidence of progress.

Week 2 - Time Management & Pacing Strategies

We will develop pacing routines that keep groups on track while preserving student responsibility for the math. LJTs will plan checkpoints, transitions, and presentation timing strategies that support productive collaboration.

Week 3 – A Framework for Choosing Appropriate Mathematical Tasks

We will use the Stein/Smith cognitive demand framework to classify tutorial tasks and clarify what makes a task effective for collaborative learning. Participants will practice adapting tasks so that meaningful collaboration is necessary for success.

Week 4 – Maintaining Cognitive Demand During Facilitation

We will practice facilitation moves that preserve cognitive demand without simplifying tasks into step-by-step procedures. Participants will develop leading and follow-up questions that sustain conceptual reasoning and effective group discussion.

Week 5 - Consolidation Week

This week will consolidate Weeks 1-4 and the last quarter through structured review and short facilitation rehearsals with peer feedback. LJTs will refine one concrete facilitation move to implement the following week.

Week 6 – Equitable Participation and Peer Interaction

We will focus on strategies that promote balanced participation and increase student-to-student interaction within groups. LJTs will learn concrete moves to broaden participation and support equitable collaboration.

Week 7 – Process Skills + Courteous Interaction and Conflict

We will coach process skills such as communication, teamwork, and self-management, and develop consistent responses to common classroom tensions. Participants will rehearse interventions that maintain a respectful learning environment and keep groups working productively.

Week 8 – Applying Perry's Scheme to Support Metacognition

We will use Perry's framework to interpret common patterns in students' thinking about certainty and justification. LJTs will practice prompts that encourage reflection, strategy comparison, and stronger reasoning.

Week 9 – Learning from Feedback

We will synthesize peer observations, instructor/GTA feedback, and goal-related evidence from the quarter. Each LJT will identify one practice to continue and one specific improvement goal for Spring.