Course No. 306.2

Methods of Collective Mathematical Learning

Credits: 2

Weeks: 7

Meetings: 4 hours every week (virtual)

Starting date: June 17, 2022

Weekly timings: Tuesdays and Fridays, 10am to 12pm

Instructor: Dr. Tathagata Sengupta

Course Description:

A key focus of this course is to discuss the phenomenon of 'rigor' in the learning of mathematics. Most of the existing mathematics education literature focus on the idea of rigor when it comes to talking or writing (or generally expressing of) mathematical ideas. However what is lacking is detailed attention to the phenomenon of rigor when it comes to listening to a mathematical discourse. In this course we explore ways to foreground the phenomenon of listening with care, when it comes to the question of rigor. This is because the act of listening is not only central to any kind of collective collaborative work (including doing mathematics), but is also the premise upon which rigorous talking (or expressions of any kind) can take place. We plan to pursue these ideas based primarily on a thorough and careful reading of a couple of texts – one that is placed within an (imagined) mathematics classroom, and another that is placed in the overall material social context in which education takes place in today's world. Thorough readings of these texts involves pursuing some of the crucial references that are cited in these texts.

Purpose:

1. To develop an understanding of the phenomenon of doing collective mathematical work

2. To develop an understanding of listening as a critical element of collaborative mathematical practices

3. To develop an understanding of the process of listening (as care work) that is central to the phenomena of teaching and learning

Learning outcomes:

1. Developing an understanding of how to read a text placed in a particular material, historic context

2. Developing possible operationalizable paths of research going forward, specifically towards working on a thesis in mathematics education that foregrounds the phenomenon of listening as care work.

Estimated work load, and Mode of Meetings:

The course will involve fairly heavy workload in terms of readings and writing regular short notes and memos. As a preliminary estimate, each hour of meeting time would require around 4-5 hours of follow-up readings and writings. These memos, notes, journal entries would form the basis for the assignments to be submitted.

The meetings would involve sharing of reading notes and discussing highlights from the readings, particularly the points of contention that would emerge through the readings. No class time will be used for reading the texts themselves – readings are part of the preparations for the meetings, and would need to happen before class. In every meeting, parts of the texts to be read for the next meeting would be earmarked. Summary minutes of the meetings will be kept and archived as documentations from the course, for future references.

Evaluations:

There will be 2 writing assignments for the course, based on which the student's learning will be evaluated

1. One detailed essay (~ 5000 words) on a critical and comparative analysis of the texts being read
2. One detailed yet precise research proposal/essay on possible ways forward in terms of operationalizing some of the learning from the course - focusing on questions around formal mathematics education in an appropriate (as per the motivations of the respective student) context/location.

References:

Lakatos, Imre. Proofs and Refutations: The Logic of Mathematical Discovery. United Kingdom: Cambridge University Press, 2015.

Love, Bettina L.. We Want to Do More Than Survive: Abolitionist Teaching and the Pursuit of Educational Freedom. United States: Beacon Press, 2019.