

Conversation and Interaction Analysis in Science, Technology, Engineering, and Mathematics Education Research

Instructor Information

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Course Timings

TBD - in consultation with HBC Dean's Office

Consultation/Office Hours: TBD in consultation with attendees. You can also email me with requests for individual meeting time, if needed.

Acknowledgements

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Course Description & Orientation:

What is conversation & interaction analysis and what will we learn:

In this course, we will learn about how to analyze students' and teachers' talk and interaction - noticing patterns in the substance and style of talk, gesture, posture, tone of voice etc. There is steadily growing research on learning in classrooms, after-school programs, museums, homes, and playgrounds, that documents how understanding the layers in talk and interaction between participants can be one of the ways to think about *how* students learn. Relevant research in science, technology, engineering and mathematics (STEM) educational contexts has tried to understand the dynamics of

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learning from moment to moment. And “learning” here spans a pretty wide set of meanings: from disciplinary practices in science, engineering, and mathematics, to issues of identity, belonging, marginalization, connections of the learning environment to broader social structures, and how power and resources are distributed amongst the different participants equitably or not. An interesting commitment in many of these studies is to try to see how any such aspect of interest is getting built up moment to moment through the participant interactions, rather than assume them a priori. In this course, we will review some of this literature as well as try to build our own skills at carrying out some of this analysis.

The research on participants’ talk and interactions in STEM education draws on and builds on techniques for analysis of talk and interactions developed in various fields such as linguistics, sociolinguistics, anthropology, psychology, textual analysis, and literary analysis. A variety of terms such as conversation analysis (CA), interaction analysis (IA), discourse analysis (DA), and critical discourse analysis (CDA) have been used to describe the methodologies. These terms refer to sets of techniques that are often overlapping. However, there are also important differences between them. There is similar overlap and distinctions in how these analyses methodologies orient to values, distribution of and access to power and resources (ideologies), and what categories of things they consider important/relevant (ontologies). These differences flavor the analysts’ sense of inquiry questions, phenomenon to attend to, choices for representing phenomenon, etc. In this course, I hope that we will explore some of these methodologies through reading some of this research, as well as how they have been adopted/adapted within STEM education research.

I would, however, not like to simply get lost in analysis as techniques. Navigating everyday situations, each of us also has a wealth of intuitive knowledge to interpret what someone else is saying or doing and how to participate in those social interactions. I will encourage us to bring these everyday intuitions in conversation with the formal techniques, enriching both.

Structure of the course:

- ~3 weeks: Some introductory and survey pieces that give a broad overview of some of the methodologies. Here we all read the same paper/chapter to discuss. Reading the same pieces will help establish common language and practices.
- ~5 weeks: Discussing some papers from socio-linguistics, anthropology, and conversation and discourse analysis. Here we all read the same paper/chapter to discuss. Reading the same pieces will help establish common language and practices.

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- ~5 weeks: Exploring how these techniques have been used by and built upon by STEM education researchers. Here, readings would be driven by student interest and student presentations. I will work with each student to identify 5-7 articles/journals that would be of interest to them. Here's a [reference list](#) for helping choose papers (but don't be intimidated by the list, we will do this together). On the day a particular student is presenting a synthesis of the 5-7 articles, other students would come prepared having read some of these papers/chapters, so that we can use class time for discussion/reflection.
- ~2 weeks: Wrap up.
- Throughout, we will also engage in some intuitive collaborative analysis of audio or video clips of scenes from educational settings, advertisements, and scenes from everyday life.

I anticipate that our actual trajectory might be messier than this neat sequentiality. **In adjusting the course trajectory, I would be tuning in and attending to your needs and interests. So, please communicate these to me throughout!**

A note on in-class analysis: I want us to orient to the course as a space where we will engage in collaborative analysis ourselves, and not limit to reading analysis that other scholars have carried out already. As such, if you have data from your fieldwork or dissertation that you would like to analyze using some of the techniques we are reading about, that would be lovely. The objective here would be to strengthen familiarity with formal techniques as well as our intuitions for doing conversation/interaction/discourse analysis. *I will be more than happy to work with you to figure out responsible ways in which we could draw on that data for class discussion, and/or collaborative analysis, and/or feedback.*

Course Goals

These are some starting thoughts on what we might want to get out of the course. I will also try to work with you to create more personalized goals:

- Forming an inclusive community in the course -- attending to power in our own interactions in class
- Connecting life and research: seeing connections between what you read/learn in the course and the discourses you are a part of in non-research/non-academic settings
- Developing familiarity with research in conversation and interaction analysis from educational settings as well as linguistics/socio-linguistics/anthropology/etc.
 - Situating existing research within its sociocultural and historical settings
- Building self-efficacy for using these techniques to do our own analysis
 - Orienting to power, ethics, and values when doing analysis

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- Approaching research/analysis with humility.
- Refining Communication Skills for presenting conversation/interaction analysis in written/oral forms

Assessments

1. **Review Paper:** Based on your disciplinary interest within STEM, I would ask you to write a short review of how conversation and interaction analysis has been used within the domain of your interest. Midway through the course, I will work with you to identify articles/journals that would be of interest. I am hoping that the review will include anywhere from 5-7 journal articles. Here's a [reference list](#) for helping choose papers (but don't be intimidated by the list, we will do this together). The idea here is not simply to summarize the articles, but to make an argument, reflecting your own synthesis. It is likely that the review-paper would need 1-2 rounds of revision based on class feedback. **Note:**
 - a. Course readings on use of CA/DA/IA/CDA in education research within STEM domains will be guided by the articles that are chosen for these review papers.
 - b. *Exploratory:* It would also be awesome if the review paper was written considering practicing/in-service teachers as the readers or if it was used to edit/add-to wikipedia, or we could design a course wiki to host this. These reviews could be useful for other graduate students. As you can see, I haven't thought this out fully, and would need some help from you in thinking this through and executing this part.
2. **Analytical Memo:** Based on your disciplinary interest, you and I will identify a short segment of data, either available online in public repositories, popular media, or some data from your dissertation or field work. You will be asked to write an analytical memo (~3-5 pages), analyzing this data-bit using the techniques being discussed in the course. It is likely that the memo would need 1-2 rounds of revision based on class feedback. The analytical memo can be aimed at a research audience.
3. **Class Presentations:** Short, conference style, 15 minute presentations. Depending on how it works out, I will work with you to make this happen in synchronous settings or asynchronous ones. I am thinking 2 presentations per person, tied to the Review Paper and Analytical Memo described above.
4. **Self Assessment Rubric:** At the start, each person will set some intention for their own highest priorities for learning and create mechanisms to trace their own growth along those dimensions.
5. **Peer Review:** We will work out a system such that feedback on the review paper and analytical memo is from me as well as from your peers. We will talk about the review process in class. Number of reviews per person will depend on how

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many folks sign up for the course. But I will try to resolve this uncertainty early on in the course. Again, this is a bit exploratory right now - but I am confident that working together we can come up with a good system.

6. *Participation*: This involves active participation in discussions during synchronous meetings, and with tasks assigned to be done in-between meetings, such as readings, peer reviews, etc.

Course Modality and Technological Needs

We will meet synchronously online during class times using the webinar.hbcse.tifr.res.in interface that uses the Big Blue Button platform. We will mostly join the synchronous sessions via audio (though we might try to do video-calls on occasions, depending on bandwidth availability). We might need to work synchronously on a document during class, or view a video posted online (on some suitable repository such as wetube.metastudio.org). So, joining the synchronous sessions would be best through a laptop, but if you can only join via a phone, I will try to work with you to figure out a workflow that would make sense for you.

The static documents of the course (Syllabus, article PDFs, etc) will be stored on HBCSE's cloud, badal, and links for downloading these will be shared with you via email. The dynamic/editable documents (such as meeting notes) would be stored on etherpad via a private group created on metastudio.org for our course. We will work on videos stored on wetube.metastudio.org. Thanks! More on this in the first class.

Please also send an email to ayush@hbcse.tifr.res.in with an email address for communication. Email will be used for all course communication. Please also add ayush@hbcse.tifr.res.in and ayush.hbcse@gmail.com to your contacts list, so your email client doesn't classify course communication as spam! (:D)

For assignments and course readings, you will need to be able to use a word processing software of your choice, a presentation software of your choice, as well as a PDF reader. If you need help with this, please let me know.

Accommodations

The pandemic continues to be an evolving situation, poses many uncertainties, and in general, has reduced our own capacities and that of our personal ecosystems. In light of this, (and given that this is my first instance of teaching this course), we will try to be flexible in following the syllabus, collectively making changes or creating personalized pathways, as needed.

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If you need to miss class for some reason, please let me know in advance. If it is an unexpected emergency that prevents you from attending class, please get in touch with me after class, once it is possible to do so.

Academic Integrity

The main point here is that I want each of us to be responsible for our own learning *and* for the learning of our classroom community. This could play out in myriad ways - and we can have classroom or 1-1 discussion on this as we go through the semester.

Schedule

Week	Tentative Topics/Activities
Week 1 - 3	<p>Activities:</p> <ul style="list-style-type: none">● Class Norms● Collaborative Data Analysis<ul style="list-style-type: none">○ Desi Advertisements○ Scene from focus group/class○ Scene from interview● SelfAssessment + elaboration due on the 1st day of Week 2 <p>Readings (*Note that readings in the course will be adjusted to accommodate emergent discussions and students' interests):</p> <ul style="list-style-type: none">● Siegler, R. S., & Crowley, K. (1991). The microgenetic method: A direct means for studying cognitive development. <i>American psychologist</i>, 46(6), 606.<ul style="list-style-type: none">○ [Optional] Parnafes, O. (2013). <i>Microgenetic learning analysis: A methodology for studying knowledge in transition. Human Development</i>, 56(1), 5-37.○ [Optional] Fazio, L. K., & Siegler, R. S. (2013). <i>Microgenetic learning analysis: A distinction without a difference. Human Development</i>, 56(1), 52-58.)● Stivers, T., & Sidnell, J. (2005). Introduction: multimodal interaction. <i>Semiotica</i>, 2005(156), 1-20.● <i>Introduction</i> Chapter in: [Each person chooses 3]<ul style="list-style-type: none">○ Fairclough, N. (2001). <i>Language and power</i>. Pearson Education. [Introduction & Last Chapter]○ <i>Introduction</i>: Gee, J. P. (2014). <i>An introduction to discourse analysis: Theory and method</i>. Routledge. [Introduction]○ <i>Introduction</i>: Goffman, E. (1974). <i>Frame analysis: An essay on the organization of experience</i>. Harvard University Press. [Introduction]○ Speer, S. A. (2005). <i>Gender talk: Feminism, discourse and conversation analysis</i>. Psychology Press. [Introduction]○ Bourdieu, P. (1991). <i>Language and symbolic power</i>. Harvard University Press.● Jordan, B., & Henderson, A. (1995). Interaction analysis: Foundations and practice. <i>The journal of the learning sciences</i>, 4(1), 39-103.

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	<ul style="list-style-type: none"> ● Derry, S. J., Pea, R. D., Barron, B., Engle, R. A., Erickson, F., Goldman, R., ... & Sherin, B. L. (2010). Conducting video research in the learning sciences: Guidance on selection, analysis, technology, and ethics. <i>The journal of the learning sciences</i>, 19(1), 3-53. <ul style="list-style-type: none"> ○ Vossoughi, S., & Escudé, M. (2016). What does the camera communicate? An inquiry into the politics and possibilities of video research on learning. <i>Anthropology & Education Quarterly</i>, 47(1), 42-58. ● Goodnight, G. T. (1982). The personal, technical, and public spheres of argument: A speculative inquiry into the art of public deliberation. <i>The Journal of the American Forensic Association</i>, 18(4), 214-227. ● [orienting to power] [Each person picks 3] <ul style="list-style-type: none"> ○ Excerpt from "Talking Race" Chapter: Hooks, B. (2003). <i>Teaching community: A pedagogy of hope</i> (Vol. 36). Psychology Press. ○ Lorde, A. (1984). The master's tools will never dismantle the master's house. <i>Sister outsider: Essays and speeches</i>, 1, 10-14. ○ Angela Davis - <i>Women Race and Class</i> (Excerpt TBD) ○ Collins, P. H. (2009). Another kind of public education: Race, schools, the media, and democratic possibilities. Beacon Press. (Excerpt TBD) ○ Pawar, U. & Moon, M. (2018). We also made history. (Chapter 3: "Laying Down the Foundation for Education") ○ Sarangapani, P. M. (2003). <i>Constructing school knowledge: An ethnography of learning in an Indian village</i>. Sage Publications Pvt. Ltd. [Appendix B: On Fieldnoting]
<p>Week 4 - 8:</p>	<p>Activities</p> <ul style="list-style-type: none"> ● Students should individually meet with me in the second week, to start the process of choosing pieces for the Review paper. ● Some collaborative analysis of video clips of students/teachers doing science/engineering/math ● Telling stories connecting everyday interactions with CA/IA/DA techniques <p>Readings(*Note that readings in the course will be adjusted to accommodate emergent discussions and students' interests):</p> <ul style="list-style-type: none"> ● [Language, Identity, Social Categories] <ul style="list-style-type: none"> ○ Gee, J. P. (2014). <i>How to do discourse analysis: A toolkit</i>. Routledge. [Chapter: TBD] ○ Wortham, S. E. F. (2001). <i>Narratives in action: A strategy for research and analysis</i>. Teachers College Press. [Chapter 2 and Chapter 3] ○ Erickson, F. (2004). <i>Talk and social theory</i>. Cambridge: Polity Press. [Chapter: TBD] ● [Language, Power, Institutions] <ul style="list-style-type: none"> ○ Fairclough, N. (2001). <i>Language and power</i>. Pearson Education. [Chapter: TBD] ○ Button, G. (1987). Answers as interactional products: Two sequential practices used in interviews. <i>Social Psychology Quarterly</i>, 160-171. ○ Schegloff, E. A. (1992). On talk and its institutional occasions. <i>Talk at work: Interaction in institutional settings</i>, 101-134. ○ Tannen, D., & Wallat, C. (1987). Interactive frames and knowledge schemas in interaction: Examples from a medical examination/interview. <i>Social psychology quarterly</i>, 205-216.

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	<ul style="list-style-type: none"> ○ Singh, G., Shaikh, R., & Haydock, K. (2019). Understanding student questioning. <i>Cultural Studies of Science Education</i>, 14(3), 643-697. ○ McDermott, R., & Varenne, H. (2018). Adam, Adam, Adam, and Adam: The cultural construction of a learning disability. In <i>Successful Failure</i> (pp. 25-44). Routledge. [This was originally published in 1998] ○ Lemke, J. (1990). Technical discourse and technocratic ideology. In <i>Selected papers from the 8th World Congress of Applied Linguistics</i> (Vol. 2, pp. 435-460). ● [Gender] <ul style="list-style-type: none"> ○ Lazar, M. (Ed.). (2005). <i>Feminist critical discourse analysis: Gender, power and ideology in discourse</i>. Springer. [Chapter: TBD] ○ Speer, S. A. (2005). <i>Gender talk: Feminism, discourse and conversation analysis</i>. Psychology Press. [Chapter: TBD] ○ Hall, K. (2009). Boys' talk: Hindi, moustaches and masculinity in New Delhi. In <i>Gender and spoken interaction</i> (pp. 139-162). Palgrave Macmillan, London. ○ Mills, S. (2005). Gender and impoliteness. <i>Journal of Politeness Research</i>, 1(2), 263-280. ○ Davies, B. (1989). The discursive production of the male/female dualism in school settings. <i>Oxford Review of Education</i>, 15(3), 229-241. ○ Harinath, S., & Raghunathan, V. (2017). Conversation analysis in tamil speaking male children. <i>Journal of Indian Speech Language & Hearing Association</i>, 31(2), 48. ● [Doing CA/IA/DA/CDA using field notes] <ul style="list-style-type: none"> ○ Emerson, R. M., Fretz, R. I., & Shaw, L. L. (2011). <i>Writing ethnographic fieldnotes</i>. University of Chicago Press. ○ Archer, L., Dawson, E., DeWitt, J., Godec, S., King, H., Mau, A., ... & Seakins, A. (2017). Killing curiosity? An analysis of celebrated identity performances among teachers and students in nine London secondary science classrooms. <i>Science Education</i>, 101(5), 741-764. ○ Sarangapani, P. M. (2003). <i>Constructing school knowledge: An ethnography of learning in an Indian village</i>. Sage Publications Pvt. Ltd. [Chapter 8: Children's Epistemology 1: Children as Knowers] ● [Multimodal/Multimedia/Emotion/] <ul style="list-style-type: none"> ○ Goodwin, M. H., & Goodwin, C. (2000). Emotion within situated activity. <i>Communication: An arena of development</i>, 33, 53. ○ Goodwin, C. (2007). Participation, stance and affect in the organization of activities. <i>Discourse & Society</i>, 18(1), 53-73. ○ Dash, A. K., Patnaik, P., & Suar, D. (2016). A multimodal discourse analysis of glocalization and cultural identity in three Indian TV commercials. <i>Discourse & Communication</i>, 10(3), 209-234.
<p>Week 9 - 13:</p>	<p>This portion of the course shall be led by students' choices of papers using CA/IA/DA in STEM education research. And their choices of videos for analysis. Here's a reference list later for helping choose papers (but don't be intimidated by the list, we will do this together). But one orientating review paper to start out would be:</p> <ul style="list-style-type: none"> ● Philip, T. M., & Gupta, A. (2020). Emerging perspectives on the co-construction of power and learning in the learning sciences, mathematics education, and science education. <i>Review of Research in Education</i>, 44(1), 195-217. <p>Review paper presentations based on where students are at in the process. And analysis of at least one video in class per week.</p>

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Week 14-15:	Peer Reviews on papers and Memos Final discussions on use of CA/IA/DA in Indian STEM-ed contexts.
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