ED 191 - How to Be an Antiracist STEM Educator

A 2 SHU seminar/study group offered through the Department of Education, sponsored by the Center for STEM Diversity and the Institute for Research on Learning and Instruction (IRLI).

Faculty Facilitators: Julia Gouvea, Ellise LaMotte, David Hammer
Time: 10:30-12:00 Thursdays, on Zoom (link coming)

The title draws from Ibram X. Kendi's book, *How to Be an Antiracist*. Professor Kendi opens with two definitions:

> "RACIST: One who is supporting a racist policy through their actions or inaction or expressing a racist idea.
> ANTIRACIST: One who is supporting an antiracist policy through their actions or expressing an antiracist idea." (p. 13)

He goes on to present various forms of racism and antiracism that manifest in policies, practices, and ideas about, for example, biology, culture, behavior, and gender. He emphasizes that any of us can be racist or antiracist, in different moments and in different ways.

We are motivated to develop this seminar as college STEM educators who almost certainly are or have been racist in our work. Our purpose is to learn how to be antiracist educators. That means learning about what are or might be racist and antiracist policies, practices, and ideas, in college STEM education.

We plan three forms of activities for the seminar. The first and main activity will be reading and discussing scholarship related to diversity, equity, and STEM disciplinary thinking and learning. Second, we will bring, and invite participants to bring, relevant examples from courses or other learning contexts at Tufts — "data" for us to examine. Third, we will invite guest speakers to join us — these talks may happen at times other than the regular group meetings.

The main learning outcomes we hope to achieve are

1. New understandings of what may contribute to racism, or antiracism, in STEM education, including with respect to subject matter, pedagogy, and institutional structures and practices.

2. New understandings—and openness to further considerations—of how *we* might be racist or antiracist in our roles as STEM educators.

3. Some specific, actionable plans. We will ask all participants toward the end of the semester to present ideas for their next steps.
   These plans may be in the form of new approaches to participants' roles as teaching assistants or tutors, or perhaps of advocacy on campus for changes in policy.

(For the three of us as learners--Julia, Ellise, and David--one specific outcome will be our next iteration of the syllabus for this seminar.) It's also possible that our work together will raise questions that the existing literature does not fully answer, and perhaps some of these will lead participants to develop proposals for new investigations.

We are offering this as a credited seminar, but we intend it to run as a collaborative study group. It is open to all who are involved in STEM education at Tufts, to a maximum of 20 registrants.

Requirements and grades

The core requirements are reading and participation in discussions, both in the real-time conversations on Zoom and in an asynchronous discussion board on Canvas.

Here's how the course will run: We will post a (manageable!) reading assignment every week, by Friday at noon, along with a prompt for response on Canvas. Everyone will post their response by Wednesday at noon. That's the "homework," reading and posting a response.

The study group discussion will begin from there online, asynchronously: Please spend 30 minutes reading and responding to others' posts on the discussion board. Our Zoom discussions Thursday morning will pick up the discussion from there. (And we will choose the next reading assignment informed by the discussion that takes place.)

The grading in the seminar will be entirely S/U, where "S" means you've participated throughout the semester. If anyone's participation starts to become an issue for anyone (e.g. missing more than one session of class), we will speak with them privately.

Expectations

Given the subject matter of the seminar, it is likely some of our conversations will be difficult. Part of our work at our first meeting will be to discuss our expectations of each other in this work, but we know they will include mutual respect, with an openness to hearing and learning to recognize others' possibly very different perspectives and experiences. They will also include a commitment to making the study group a safe and confidential space for personal, possibly sensitive sharing.

For a start, part of preparing for that first meeting, we ask that everyone read the essay "Leading Courageous Conversations on Race Equity" posted by Nonprofit New York.

Four areas of attention

There are several ways this will be a challenging seminar, including for the personal, sensitive nature of the topics, but also for their complexity. As we'll see, these four areas interact in complex ways. We are beginning with a draft of a plan for the flow of our attention, across four

areas we will describe here, but we expect and encourage participants to affect that flow; we plan to be responsive to the substance of the group's interests and inquiries.

Roughly, we see four interacting areas for our studies to consider:

> *Disciplines*. We should spend some time considering what are these disciplines we are trying to teach. What are their core values, methods, and epistemologies; what are their histories and communities? How have they generated or perpetuated racist ideas and policies? How might they promote antiracist ideas and policies?
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> *Learners.* Who are the learners we are trying to serve, and what do they bring with them from their prior lives and schooling, informal and formal knowledge and experience, cultures and expectations? How do educators—how do we—conceptualize our students abilities and needs? What conceptualizations might lead to racist stances toward learners? What does it mean to take an antiracist stance?
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> *Universities.* How are universities—and Tufts in particular—structured? What are the institutional policies and practices that influence learning and teaching, such as around grading, GPAs, and formal recognitions of success? What are the institutions' practices around the sizes and modalities of instruction? Where can we locate racist structures and the potential for antiracist action?
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> *Pedagogy and Curriculum*. What are the ways university faculty design courses and conceptualize curriculum? What have faculty generally done, how are faculty considering change — this means considering notions of instruction from "delivery" to "active learning," of assessment, of the nature of the relationships between faculty and students. What does it mean to strive towards antiracism in teaching?

In every one of these respects, we hope and expect our readings, discussions, and explorations to get us into "good trouble, necessary trouble," as John Lewis put it in his farewell essay.

Readings

We have chosen two books to serve as the intellectual centerpieces of our attention. The first, obviously, is *How to Be an Antiracist*. It is not a book about STEM education; it is about racism and antiracism in society, but it will serve as a foundation for our studies.

The second is *Braiding Sweetgrass: Indigenous wisdom, Scientific Knowledge and the Teachings of Plants.* That book is very much about science education and the complex relationships between learners, culture, and formal schooling.

We will be assigning particular chapters from these books along the way, but we recommend you just buy and read them both.

Kendi, I. X. (2019). *How to be an antiracist*. New York: One World.
Kimmerer, R. W. (2013). *Braiding sweetgrass: Indigenous wisdom, scientific knowledge and the teachings of plants*: Milkweed Editions.

For the rest, we have assembled a starter pool of possibilities from the research literature. There is no chance we'll read all of these articles, not if we want to keep the reading load manageable! At the same time, we don't think this list is complete; we encourage participants to add to it. One outcome of this course will be a growing bibliography.

Agarwal, P., & Sengupta-Irving, T. (2019). Integrating Power to Advance the Study of Connective and Productive Disciplinary Engagement in Mathematics and Science. *Cognition and Instruction*, *0*(0), 1–18. https://doi.org/10.1080/07370008.2019.1624544

Bang, M., & Medin, D. (2010). Cultural Processes in Science Education: Supporting the Navigation of Multiple Epistemologies. *Science Education, 94*(6), 1008-1026. doi:10.1002/sce.20392

Bang, M., Warren, B., Rosebery, A. S., & Medin, D. (2012). Desettling Expectations in Science Education. *Human Development, 55*(5-6), 302-318. doi:10.1159/000345322

Battey, D., & Leyva, L. A. (2016). A Framework for Understanding Whiteness in Mathematics Education. *Journal of Urban Mathematics Education, 9*(2), 49-80.

Brandt, G. L. (1986). The realization of anti-racist teaching. Psychology Press.

Boutte, G., Kelly-Jackson, C., & Johnson, G. L. (2010). Culturally relevant teaching in science classrooms: Addressing academic achievement, cultural competence, and critical consciousness. International Journal of Multicultural Education, 12(2).

Denis, V. S., & Schick, C. (2003). What makes anti-racist pedagogy in teacher education difficult? Three popular ideological assumptions. Alberta Journal of Educational Research, 49(1).Canning, E. A., Muenks, K., Green, D. J., & Murphy, M. C. (2019). STEM faculty who believe ability is fixed have larger racial achievement gaps and inspire less student motivation in their classes. *Science advances, 5*(2), eaau4734.

Eisenhart, M., & Allen, C. D. (2020). Addressing underrepresentation of young women of color in engineering and computing through the lens of sociocultural theory. *Cultural Studies of Science Education*. doi:10.1007/s11422-020-09976-6

Estrada, M., Burnett, M., Campbell, A. G., Campbell, P. B., Denetclaw, W. F., Gutiérrez, C. G., . . . McGee, R. (2016). Improving underrepresented minority student persistence in STEM. *CBE—Life Sciences Education, 15*(3), es5.

Good, J. J., Bourne, K. A., & Drake, R. G. (2020). The impact of classroom diversity philosophies on the STEM performance of undergraduate students of color. *Journal of Experimental Social Psychology, 91*. doi:10.1016/j.jesp.2020.104026

Harris, R., Mack, M., Bryant, J., Theobald, E., & Freeman, S. (2020). Reducing achievement gaps in undergraduate general chemistry could lift underrepresented students into a "hyperpersistent zone". *Science advances, 6*(24), eaaz5687.

Howard, T. C. (2003). Culturally relevant pedagogy: Ingredients for critical teacher reflection. *Theory into practice, 42*(3), 195-202.

Ladson-Billings, G., & Tate, W. F. (2006). Toward a critical race theory of education. *Critical race theory in education: All God's children got a song, 11*, 30.

Martin, D. B. (2009). Researching race in mathematics education. *Teachers College Record, 111*(2), 295-338.

Medin, D. L., & Bang, M. (2014). *Who's Asking?: Native Science, Western Science, and Science Education*. Cambridge, MA: MIT Press.

Miyake, A., Kost-Smith, L. E., Finkelstein, N. D., Pollock, S. J., Cohen, G. L., & Ito, T. A. (2010). Reducing the gender achievement gap in college science: A classroom study of values affirmation. *Science, 330*(6008), 1234-1237.

Morales-Doyle, D. (2017). Justice-centered science pedagogy: A catalyst for academic achievement and social transformation. *Science Education, 101*(6), 1034-1060.

Palmer, R. T., Maramba, D. C., & Dancy, T. E. (2011). A Qualitative Investigation of Factors Promoting the Retention and Persistence of Students of Color in STEM. *The Journal of Negro Education, 80*(4), 491-504. Retrieved from http://www.jstor.org/stable/41341155

Philip, T.M., Olivares-Pasillas, M. C., & Rocha, J. (2016). Becoming racially literate about data and data literate about race: A case of data visualizations in the classroom as a site of racial-ideological micro-contestations. *Cognition and Instruction, 34*(4), 361-388.

Steele, C. M. (1999). Thin ice. *Atlantic Monthly, 284*(2), 44-53.

Strayhorn, T. L., & Saddler, T. N. (2009). Gender differences in the influence of faculty–student mentoring relationships on satisfaction with college among African Americans. *Journal of African American Studies, 13*(4), 476.

Tate, W. F. (1995). Returning to the root: A culturally relevant approach to mathematics pedagogy. *Theory into practice, 34*(3), 166-173.

Treisman, U. (1992). Studying students studying calculus: A look at the lives of minority mathematics students in college. *College Mathematics Journal, 23*(5), 362-372.

Walton, G. M., & Cohen, G. L. (2011). A brief social-belonging intervention improves academic and health outcomes of minority students. *Science, 331*(6023), 1447-1451.

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