
Changing the game in two-year college mathematics classrooms

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Outcomes for today's workshop

- Come to know each other as educators committed to social justice
 - Review some concepts from the *Equity in Practice* reading by using these concepts to make sense of our work
 - Leverage a description of ***Signature Pedagogies*** to challenge deeply held assumptions that continue to produce inequitable outcomes for students in mathematics
 - Demonstrate understanding of three components of Inclusive Pedagogy -- access, belonging and success -- by developing strategies we can use in our 'classrooms.'
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Introductions

We want acknowledge the identities we bring to 'changing the game' in mathematics classrooms and what brings us to this work.

Equity in Practice

“the onus is on *our* community to maintain high academic standards as we consider systemic barriers in learning mathematics” (p.125).

<i>Four dimensions of equity</i> (pp. 122-124)	<i>Equality versus equity</i> (p. 124-125)
<i>Anti-deficit perspective</i> (pp.125-126)	<i>Growth mindset</i> (p. 125)

TASK (8-10 minutes)

Process: Use one of these four concepts as a lens for discussing this quote.

Product: Share one takeaway from your discussion on your assigned slide

Breakout Group 1: Four dimensions of equity (pp. 122-124)

“the onus is on our community to maintain high academic standards as we consider systemic barriers in learning mathematics”(p.125).

Creating a math family to encourage the identity aspect of equity

Learning takes place and participation is encouraged

Students establish classroom environment, expectations, likes/dislikes in previous experiences

Students have a say in their their learning environment for the power aspect of equity

Understanding for students of outside responsibilities (work, family)

Scavenger hunt to introduce the class between students and instructor

Students send a video to introduce themselves, took notes to learn about students

Virtual learning challenges for group work (Desmos activities, polls)

Breakout Group 2: Equality versus Equity (pp. 124-125)

“the onus is on our community to maintain high academic standards as we consider systemic barriers in learning mathematics”(p.125).

Amy Bonam, Barbie Hoag, Kristi Laird, Emily McAllister, Jeff Morford

Self-formed study groups- do student biases affect these? How could we mitigate this? What is an equivalent support?

Can you advertise tutoring and deliver it right to students? Can you feed them? High schools do this. What is analogous in colleges?

Remote learning- internet signal strength, devices, multiple devices

Make sure you know the students and how they get to school- individual introductions and interviews. Everyone listened better to all.

In high school getting to know students is crucial. This could/should transfer to the community college.

Does relative (video) anonymity affect the classroom in remote learning?

Breakout Group 3: Anti-deficit perspectives (pp. 125-126)

“the onus is on our community to maintain high academic standards as we consider systemic barriers in learning mathematics”(p.125).

Unconscious bias when calling on students
Students feeling comfortable vs high academic standards

Breakout Group 4: Growth mindsets (p. 125)

“the onus is on our community to maintain high academic standards as we consider systemic barriers in learning mathematics”(p.125).

Thoughts from our group:

- **Growth mindset focuses on the student, not on structures. We can't let the push for growth mindset or grit distract us from also dismantling systemic barriers.**
 - **Asking questions that get at growth mindset can push us toward good non-routine tasks that make class more rigorous (in a good way).**
 - **What does 'high standards' mean--why do we have the current set of standards, and should they be changed (to be more modern?) pg 123 “Who benefits from the teaching of mathematics and to what end?” or “Is this mathematics empowering students or does it maintain the status quo?”**
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Breakout Group 5: Four dimensions of equity (pp. 122-124)

“the onus is on our community to maintain high academic standards as we consider systemic barriers in learning mathematics”(p.125).

Breakout Group 6: Anti-deficit perspectives (pp. 125-126)

“the onus is on our community to maintain high academic standards as we consider systemic barriers in learning mathematics”(p.125).

Signature Pedagogies

“The psychoanalyst Erik Erikson once observed that if you wish to understand a culture, study its *nurseries*. There is a similar principle for the understanding of professions: if you wish to understand why professions develop as they do, study their nurseries, in this case, their forms of *professional preparation*. When you do, you will generally detect *the characteristic forms of teaching and learning that I have come to call signature pedagogies*. These are types of teaching that organize the fundamental ways in which future practitioners are educated for their new professions” (p. 52).

Shulman, L. S. (2005). Signature pedagogies in the professions. *Daedalus*, 134(3), 52-59.

Signature Pedagogies

“Signature pedagogies are important precisely because they are **pervasive**. They implicitly define **what counts as knowledge** in a field and **how things become known**. They define how knowledge is analyzed, criticized, accepted, or discarded. They define the functions of **expertise in a field, the locus of authority**, and the privileges of rank and standing.. these pedagogies even determine the **architectural design** of educational institutions, which in turn serves to perpetuate these approaches” (p. 54).

Shulman, L. S. (2005). Signature pedagogies in the professions. *Daedalus*, 134(3), 52-59.

Two mathematics classrooms

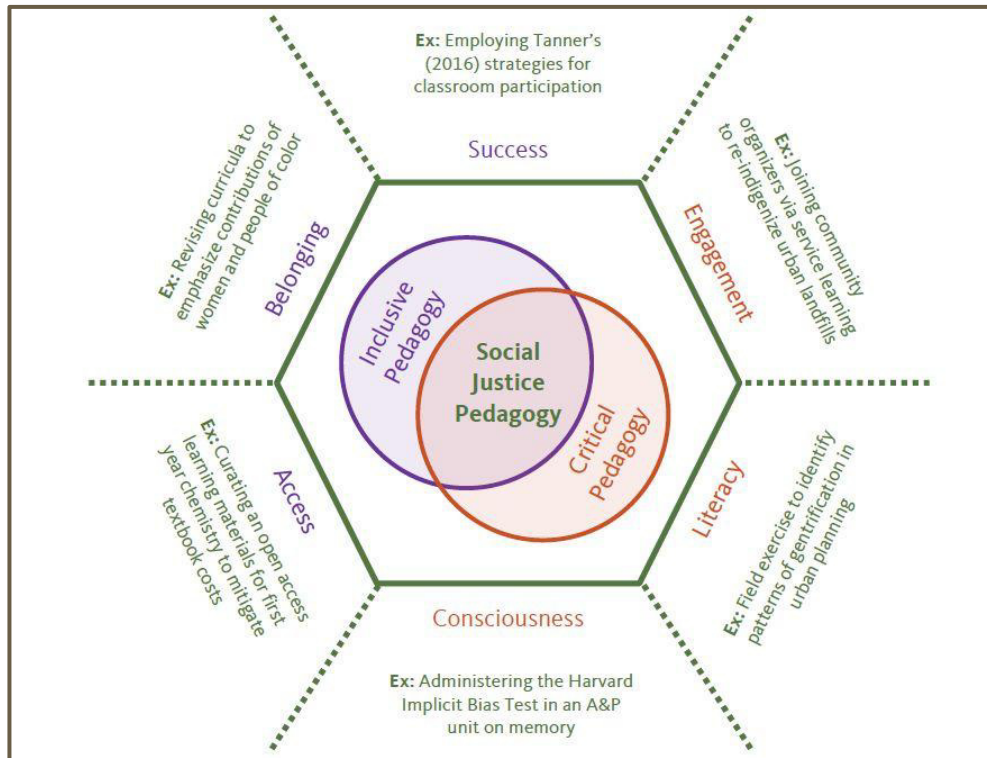
As you watch these two examples of mathematics classrooms, what does each suggest about:

- What counts as knowledge in mathematics?
 - Who counts as an expert or authority in these mathematics classrooms?
 - Which classroom is an example of 'signature' or pervasive pedagogies?
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Break



A social justice pedagogy: Inclusive practices



Kenney, J. (2020, May 20). *Ways to infuse inclusivity and diversity into teaching*. Paper presented at Oregon State University, Corvallis, OR.

Inclusive practices: Unpacking inclusive practices

Task

Groups will explore one of the three components of inclusive practices: ***access, belonging*** and ***success***.

Process (10 minutes): (1) Use the definition of the component assigned to your group, the three related goals and related examples to make sense of each component; and (2) Draft an activity or *routine* that will support mathematics students to achieve one of the three goals.

Inclusive practices: Unpacking inclusive practices

Task

Groups will explore one of the three components of inclusive practices:
access, belonging and ***success***.

Product: (Part 1: 5 minutes) Record your understanding of your assigned component and your draft activity or routine on your Google Slide; and **(Part 2: 3 minutes)** Share your understanding and example.

Breakout Room 1: Access

Mitigating Barriers to entry or full participation

- Open-source textbook
 - Electronic textbook integrated into course enrollment
 - Consider what technology is REALLY needed and not what we'd like
 - Scientific vs graphing calculators
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Breakout Room 2: Access

Breakout Room 3: Belonging

Breakout Room 4: Belonging

Breakout Room 3: Success



Flexibility and responsiveness in educational practice

Flexibility:

- posting lecture notes in Canvas or other LMS for students who are working during class times.
- Offer a final project instead of a final exam?
- Allow a video report rather than a written report in a Quantitative Reasoning class?
- Give 20 problems and say solve only 12 of them?
- Let students try problems over and over until they have mastered them.
- Be flexible on timelines--a window rather than a strict deadline.

Examining and negotiating notions of success

Negotiation:

- the Pathways movement?
- Students who didn't get at least a 71% on an exam come talk during office hours--reduces the stigma of having to reach out to instructor, since now it's the rules.
- Mastery Learning--if students choose which skills to master

Facilitating equitable distribution of resources

Resources:

- having videos captioned, so students who have busy/loud home lives can understand the videos; also posting lecture notes in Canvas or other LMS
- Videotaping lectures for students not free at that time due to COVID life changes.

Breakout Room 6: Success



Wrapping up

What did you learn?

What are you going to do based on what you learned?

Thank you

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1. Define and recognize the importance of DEI 2. Challenge deeply held assumptions, perspectives, and beliefs that continue to produce inequitable outcomes for students in mathematics courses 3. (a) Attain clear and concrete definitions and explanations of DEI to ensure that all faculty have the foundational knowledge necessary to support continued learning and development; (b) Adopt reflective strategies that can be used to change how we see our work within mathematics education 4. (a) Receive resources and training that designs an equitable classroom for all students; (b) Provide access to strategies that support the goal of equity and inclusion, which enables all students to succeed;

1. (a) Share a learners' experience in high school that did not prepare him for college-level mathematics (short video); (b) share disaggregated data that illustrates who is and is not successful earning credit for a college-level mathematics course at a two-year college 2. Engage in two short activities that will challenge our assumptions about who does mathematics and what doing mathematics is. 3. Discuss the model of equity in mathematics education articulated by Rochelle Gutierrez in the short paper "Framing Equity: Helping Students 'Play the Game' and 'Change the Game,'" which will be provided as a pre-reading if instructors are signing up for the workshop. This particular model of equity is useful as a tool for reflecting on teaching practice. 4. Share practical resources for creating an inclusive classroom and mathematical teaching practices that provide equitable opportunities to engage in deep mathematical thinking.