DISRUPTING INJUSTICE THROUGH MATHEMATICS TEACHING:
LEARNING TO SEE, CONNECT WITH, AND BUILD STUDENTS’ RESOURCES

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THE POWER OF TEACHING

- For students’ academic learning
- For students’ sense of belonging
- For students’ sense of themselves as smart, capable, and for their perseverance

BUT—

It works both ways.

Listen to the power of teaching through the voices of students.
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Was there a teacher who had a significant impact on you?
VIDEO: IS THERE A TEACHER WHO HAD A SIGNIFICANT IMPACT ON YOU?
(HOW) CAN WE DELIBERATELY MAKE TEACHING A FORCE FOR JUSTICE?

- How do we harness the power of teaching for individual flourishing, and for a just society?

- How do we educate so that we stop wasting lives, stop hate and killing? (Maisha Winn, Ihab Hassan)

- How do we use the opportunity of our times?
PRIORITY RECOMMENDATIONS

- Strengthen the student educational experience
- Increase completion and reduce inequities
- Control costs and increase affordability
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This means teaching.
WHAT IS THE “STUDENT EDUCATIONAL EXPERIENCE”? 

Experiences shaped by and with—

- the quality of teaching
- interactions and relationships with faculty and with other students, in and outside of classes
- the significance and relevance of the curriculum
We leave the power of teaching to chance.

Teaching can do great harm.

Teaching can have powerful positive impact.
What number does the orange arrow point to? Explain how you figured it out.
LAKEYA

What number does the orange arrow point to?

Explain how you know: because there are equal parts and you are pointing to the second one so 5/2.

JAMARI

What number does the orange arrow point to?

Explain how you know: first I thought it was 3 because it's zero more me up.

MARIANA

What number does the orange arrow point to?

Explain how you know: how I know it's zero is that there was 2 between 0 and 1.5.

LARRY

What number does the orange arrow point to?

Explain how you know: I count it by 1 and keep going till I got whole.

Write a complete sentence with one goal for yourself for our math class today. Give an example of what it looks like to do this really well.

Learn more about the number line.
VIEWING FOCUS

What do you think are the most frequent comments that educators make about Toni? About Aniyah?
VIDEO: ANIYAH AND TONI

Teacher: Listen closely and see what you think about her reasoning and her answer.

This video and additional supporting materials are available online here.
WHAT ARE THE MOST FREQUENT COMMENTS?

TONI

- Toni is fooling around with another student across the room and laughing at Aniyah.
- Toni is being disrespectful to Aniyah.
- Toni knows that Aniyah is wrong and is trying to point that out.
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- Aniyah has the wrong answer.
- Aniyah should not remain at the board with a wrong answer. She probably feels bad and is possibly confusing other children.
- Aniyah is harmed by how Toni is treating her.
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Where do these common responses come from?
What commonly would happen next?

What are the possible results?
IN THIS MOMENT, A MOVE CAN REPRODUCE PATTERNS OF MARGINALIZATION OF BLACK GIRLS AND REDUCTIONIST VIEWS OF MATH

NORMALIZED NEXT MOVES

- “Can someone help Aniyah out and show what we call the whole on the number line?”

- “Great, Aniyah, almost! But remember that the whole is from 0 to 1.”

- “Thumbs up if you agree with Aniyah; thumbs down if you disagree.”

RESULTS

- Aniyah is excluded and her mathematical contributions are sidelined.

- Aniyah’s answer is signaled to be incorrect and she is positioned as not having contributed to the work.

- Aniyah’s solution is “voted” on by her classmates.
“Toni, when you’re ready to participate appropriately by not playing with your hair and laughing, and have a question to ask, I will come back to you.”

“You need to be a better listener, Toni. Aniyah already explained why she picked one-seventh. Who else has a real question for Aniyah?”

“In this classroom, we are respectful of one another. When you are ready to be respectful, you can rejoin the discussion, Toni.”

Toni is publicly excluded from the discussion.

Toni is judged to not be listening, her question is judged as not good, and she is excluded from the discussion.

Toni is publicly named and shamed as “disrespectful,” rebuked, and her role in advancing the mathematics is sidelined.
WHAT DO THESE DIFFERENT TEACHING MOVES DO TO TONI AND ANIYAH? AND THE OTHER CHILDREN?

- Toni’s contributions to the class are not read as appropriate or valuable.
- Her participation and mathematical attentiveness are made invisible.
- Her mathematical identity is not supported.
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- Aniyah is positioned as “struggling.”
- Her precise explanation is not only not highlighted and acknowledged, but not even heard.
- Aniyah is interpreted as lacking confidence and needing to be protected.
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These combine to eclipse their humanity.

These perpetuate images of Black girls as “troublemakers” and not “good at math.”
VIDEO: ANIYAH AND TONI

Toni: Why did you pick one-seventh?
Student: You did not.
USING DISCRETIONARY SPACES TO DISRUPT INSTEAD OF PERPETUATE PATTERNS

- Interpreting Toni as asking a real question that she means.
- Hearing Toni’s question as central to advancing the mathematical content.
- Reinforcing her mathematical identity, not choosing to read her body as disruptive.
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- Interpreting Aniyah as competent to answer questions about her ideas.
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- Interpreting Aniyah as competent to answer questions about her ideas.
- Hearing Aniyah’s explanation as central to advancing the mathematical content.
- Reinforcing her mathematical identity, not choosing to read her body as struggling.

- Other children hear Aniyah as getting the discussion going, and Toni as asking an important mathematical question.
- Aniyah and Toni are both positioned as contributing to the discussion.
- Children see a teacher attending to Black girls as mathematical thinkers and contributors to collective work.
14 MINUTES AFTER WHERE WE STOPPED

TONI

ANIYAH

I did well on my goal today because my goal was to share my idea with the class and I did. I went up to the board and share my idea with the class on fractions.
THE QUALITY OF THE EDUCATIONAL EXPERIENCE DEPENDS ON CRITICALLY CONSCIOUS PROFESSIONAL PRACTICE
Teacher:
Who would like to try to explain what you think the answer is? And show us your reasoning by coming up to the board.

Student:
I would like to try to explain what I think the answer is. And show our your reasoning by coming up to the board.

Teacher:
And you know, it might be outside. That's okay because we're learning something new. I'll see someone come up and you'll be the teacher and explain how you are thinking about it. Here's how I try to figure it out.

Teacher:
Other children.
Laying on arms.

Student:
Dante.

Teacher:
You did not!

Dante:
You did not!
A discretionary space is where the next move or comment or question is necessarily determined by the teacher—and not by a policy or curriculum.

In these discretionary spaces teachers have the power to reinforce or disrupt patterns of racism, sexism, and marginalization.

Often we act without even realizing we have discretion to do something different. Countering these patterns requires habits of consciousness and alternative moves to make.
WHAT REGULARLY FILLS THE DISCRETIONARY SPACES IN TEACHING?
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1. Instructors’ experiences in a society filled with racism and oppression.

Lortie (1975), Banks, Grant and Koskela, Moll
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2. Normalized practices in higher education that institutionalize dominant values and habits.

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STUDENTS’ EDUCATIONAL EXPERIENCES: CONNECTING THE MACRO AND MICRO
SYSTEMIC PATTERN #1
THE DISPROPORTIONATE PUNISHMENT OF BLACK GIRLS

SYSTEMIC PATTERN #2
DISPROPORTIONAL ASSIGNMENT TO SPECIAL PROGRAMS BASED ON “ABILITY”

- Black students: 16.7% of student population; 9.8% of those selected to programs for academically talented students
- Latino/Latina students 22.3% of student population; 15.4% of those selected to these programs
- 6.2% of all students are assigned to these programs for “talented” students; 10% of Asian students, 7.5% of White; 3.6% of Latino/Latina; 3% of Black
- Black students are 2x as likely to be classified as having learning or emotional problems
- Exclusion from class reduces opportunity to learn
- Exclusion from rigorous content; long-term effects of labeling
- Lack of access to accelerated and enrichment programs


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LEARNING TO SEE AND USE THE DISCRETIONARY SPACES IN OUR PRACTICE

- Become aware of the density of taken-for-granted and normalized practices that reflect whiteness and oppression
- Notice and understand how much of our practice is based on these, and that these are habits
- Work on breaking habits that are rooted in racism and oppression (Noel, 2018)
- Develop new repertoires of practice and new habits and learn to scrutinize these critically
SPECIFIC INCLUSIVE PRACTICES TO DISRUPT COMMON PATTERNS THAT MARGINALIZE

1. Broadening what it means to “participate”
2. Acknowledging competence
3. Reframing “error”
4. Grading

Jamboard activity
What fraction of each rectangle below is shaded gray?
VIDEO: ANTAR, GABRIELLE, GABI, VIRSHAWN, MARQUIS, KASSIE

Antar: I think it's not a fraction because all of the parts are not equally the same shape.
BROADENING WHAT IT MEANS TO “PARTICIPATE”

1. What are the different forms of “participating” you see in this video?

2. How are these typical or different from common ways of participating?

3. What is valued and afforded by specific different forms of participating?
ACKNOWLEDGE MATHEMATICAL COMPETENCE

A set of practices that deliberately deploy the power of teaching to:

1. Broaden and label what being competent in mathematics means
2. Intervene on status hierarchies to position who (and what) is seen as competent in math class
3. Support individual students to develop their mathematical and academic identities and competence

Sources: E. Cohen and R. Lotan, complex instruction; J. Boaler’s work; Smarter Together: Collaboration and Equity in the Elementary Mathematics Classroom (Featherstone, Crespo, et al., 2011);
WHAT DOES “ACKNOWLEDGING COMPETENCE” REQUIRE IN TEACHING?

- Broaden and label what being competent in mathematics means
- Intervene to position who (and what) is seen as competent in math class
- Support individual students to develop their mathematical and academic identities and competence
- Be able to see what is “mathematical” and what is “competent”
- Have techniques for making these moves to intervene
- Strategically using these techniques with particular students in authentic and well-timed ways
USING TECHNIQUES AND STRATEGIES FOR ACKNOWLEDGING COMPETENCE

- Identify the competence to be highlighted. Consider how to disrupt hierarchies of status in class by which student is to be “called out” as competent.
- Call out an individual student’s competent move or contribution publicly (“___ just shared a very important idea”)
- Ask a student to explain another student’s contribution that the teacher highlights
- Ask the class to identify things that were part of an important contribution by one of the students
- Write something publicly that a student came up with or contributed that is important
- Accord expertise to students through assigning roles explicitly in a group
DISTINGUISHING ACKNOWLEDGING COMPETENCE FROM PRAISE

**PRAISE**

- “Good job!”
- “You’re working so well today.”
- “Nice work!”
- “I am proud of you.”
- “You’re working like such good mathematicians.”
- “You made so much progress on the problems today.”

**ACKNOWLEDGING COMPETENCE**

- “It was particularly clear how you used your drawing to explain your thinking.”
- “Belin gave a clear and specific mathematical explanation.”
- “You solved that in a really interesting way. Can you tell us more about your thinking?”
- “Ibn used a very interesting method to show that there are no more solutions. Who can say what Ibn did?”
- “It is clear how closely you are following other people’s thinking and connecting it to the idea you had.”
- “One thing that was really important about what Laken did was to use the definition we developed.”

Praise – verbal feedback with the purpose of evaluating what a student says or does

Acknowledging competence – intentional identifying, naming, and highlighting specific mathematical or learning competencies of what a student says or does
WHAT (NOT) TO SAY?

- Be authentic
- Be sensitive to context and student
- Name specific and valuable aspects of a student’s contribution or way of doing/learning
- Say things designed to make the student feel affirmed and seen, and that other students will notice and value

Some frames:

“I want to highlight something valuable that ___ just did.

“What was especially important about what ___ just contributed to our discussion?”

“Could you say/show that again? That is very important to our discussion.”
PRACTICING ACKNOWLEDGING COMPETENCE

Identify **specific examples** of mathematics learning competence and what you might say to acknowledge it, e.g.,:

- explaining one’s reasoning
- presenting one’s ideas to others
- showing a different solution approach or method
- using a representation skillfully
- connecting ideas
- asking a good question
ACKNOWLEDGING COMPETENCE

Antar, Gabrielle, Gabi, Virshawn, Marquis, Kassie

- What competences do you notice?
- What might you say to acknowledge this competence and how could it affect the positioning of this student and what is seen as competent in this class?
FOREGROUNDING AND USING “ERRORS”

Deliberately inviting or featuring “stuck” or “wrong” solutions

- Asking students to share and analyze “wrong” interpretations, answers, methods
- Posing incorrectly solved problems and asking students to explain what is wrong and why someone might do this
- Designing problems that entail appraisal of a solution
HOW WE TALK ABOUT “ERROR” MATTERS

- Making the environment “safe” is not all there is
- “Errors” are a necessary part of mathematical work
- Being “meta” about mathematical work is an important mathematical competence
  - Dwelling on things that go wrong or make you stuck
  - Analyzing solutions or methods that do not work, are not right
WHAT IS INVOLVED FOR THE TEACHER IN SEEING AND BUILDING ON STUDENTS’ STRENGTHS?

- Listening carefully to what they say, reading attentively what they write
- Making deliberate choices about how to see and interpret students
- Both of these involve using what you know, but also suspending what you assume
RECONSIDERING ERROR: ANTAR AND KASSIE

Antar “It’s not a fraction.”
Kassie: “The answer is one and a half.”

What can you hear in their statements that you can reframe away from “error”? 
RECONSIDER “GRADING”

What are some of the negative elements and effects of grading practices?
There is no neutral.
Teaching either reinforces/reproduces or it can avert and disrupt patterns.

1. AWARENESS OF PATTERNS
   - Becoming critically conscious of the patterns of interpreting and responding
   - Understanding one’s own identity and how that shapes one’s assumptions and interpretations
   - Understanding that these patterns are historical and embedded in our institutions and systems

2. AVERTING/DISRUPTING PATTERNS
   - Consciously NOT following or reproducing the patterns
   - Developing specific new habits and practices that counter the patterns
   - Strengthening your own content knowledge for teaching
MOVING ON

Discretionary spaces describe the many spaces and moments in which teachers make subjective judgments that either:

- act from habit and from patterns of white supremacy institutionalized in experience and professional training
- or act to dismantle anti-Black racism and white supremacy.

Understanding mathematics matters for doing this meaningfully!
This is our work.

To build mathematics teaching as a force for justice.

Our power is in our collective efforts to make mathematics teaching work. . . . . .

. . .to learn, to grow, to share, and to push forward with the fight.
THANK YOU!

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Slides will be available on my website
https://deborahloewenbergball.com/
(“Google” Deborah Ball)