Considerations for Creating an Equitable Learning Environment in STEM

MICROMESSAGING TO REACH AND TEACH EVERY STUDENT™ WORKSHOP

Claudia Morrell
## Agenda

<table>
<thead>
<tr>
<th>Topic</th>
<th>Approximate Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity</td>
<td>20 minutes</td>
</tr>
<tr>
<td>Spheres of Influence</td>
<td>20 minutes</td>
</tr>
<tr>
<td>Strategies and Tools</td>
<td>15 minutes</td>
</tr>
<tr>
<td>Wrap-up</td>
<td>5 minutes</td>
</tr>
</tbody>
</table>
Goal

Create an equitable learning environment in light of larger patterns of socialization in society.
Equity and Equality
Equality

Equality often means that everybody gets the *same thing*, that is, that everybody hypothetically has access to the same classes or the same opportunities.
The trouble with equality is that, if people are not starting on a level playing field, giving them the same thing maintains the inequality that already exists.
An equity approach considers disparities that exist and gives students what they need to address those disparities.
Every student deserves access to the inclusive, equitable educational opportunity, regardless of gender, race, class, religion, (dis)ability, sexual orientation, and so on.
Inequitable Access: An Illustration

Compared with low-poverty U.S. schools, high-poverty U.S. schools have:

- More teachers teaching in areas outside their certification subjects
- More serious teacher turnover problems
- More teacher vacancies
- Larger numbers of substitute teachers
- More limited access to computers and the Internet
- Inadequate facilities (such as science labs)
Inequitable Access: An Illustration

- More dirty or inoperative bathrooms
- More evidence of vermin such as cockroaches and rats
- Insufficient classroom materials
- Less rigorous curricula
- Fewer experienced teachers
- Lower teacher salaries
- Larger class sizes
- Less funding.
An Illustration: Girls, Equality, and Computer Science

• From an equality standpoint, young women have just as much access as young men to computer science or automotive high school classes.

• However, this standpoint ignores larger social and educational conditions that might point to the fact that young women do not have the same access as men.
So, young women might have *equal* access, but they certainly do not have *equitable* access.

An *equity* approach takes these bigger social and educational conditions into account—it’s about closing the gaps in access and opportunity.
Sphere of Influence
### Activity: Sphere of Influence

<table>
<thead>
<tr>
<th>Number</th>
<th>Teacher access &amp; opportunity: What I <em>can</em> control</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number</th>
<th>Teacher access &amp; opportunity: What I <em>can’t</em> control</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td></td>
</tr>
</tbody>
</table>
Dimensions of Equitable Education

1. What our students bring to the classroom
2. What we bring to the classroom
3. Curriculum content
4. Pedagogy

Adapted from the work of Maurianne Adams and Barbara J. Love (2006).
Dimensions of Equitable Education

1. What our students bring to the classroom

- Past educational experiences
  (it’s not always all about us)
- Complex identities, prejudices, biases
- Expectations about the roles of students and teachers

2. What we bring to the classroom

3. Curriculum content

4. Pedagogy

NAPEEF ©
Dimensions of Equitable Education

1. What our students bring to the classroom

2. What we bring to the classroom

3. Curriculum content

4. Pedagogy

- Complex socializations, identities, biases, and prejudices
- Notions about the purposes of education and our roles as teachers
Dimensions of Equitable Education

1. What our students bring to the classroom
2. What we bring to the classroom
3. Curriculum content
4. Pedagogy

• Course materials: Who is represented in readings, examples, illustrations?
• Perspective and worldview: Whose voices are centered? Whose are “other”ed?
• Is content, whenever possible, made relevant to the lives of the students?
• What is the “hidden curriculum”?
Dimensions of Equitable Education

1. What our students bring to the classroom
2. What we bring to the classroom
3. Curriculum content
4. Pedagogy

- Paying attention to inequity in classroom processes
- Attending to sociopolitical relationships (power and privilege) in the classroom
- Rejecting deficit ideology
The basis for any approach to equity is critical reflection.

This means that we have to learn to imagine and ask these questions, often against our own socializations.
There exists no set of administrative, curricular, or pedagogical strategies that will work for all (or even most) students when we identify those students based on a single dimension of identity.
However, it is not the responsibility of a single teacher or counselor or administrator to transform the world or even a school district.

But it is our responsibility to define our own spheres of influence and make sure we do whatever we can to make those spheres equitable and just.
Super Strategies

• To create equity, address each student’s unique needs so he or she can meet equal academic performance expectations.
• Identify institutional or organizational policies that may unintentionally create inequity. For example, assigning students to mathematics tracks that restrict career choices based on math anxiety not math competence.
• Be thoughtful how you create cooperative teams or small groups – make sure everyone has a role and stereotypes are challenged.
• Perform an environmental scan on your classroom and address climate issues
• Participate in peer observation opportunities as both an observer and being observed.
Pedagogical Tools
### Dynamic-Learning Frame

1. 
2. 
3. 
4. 

### Fixed-Performance Frame

1. 
2. 
3. 
4.

Learning Styles

- Approach to learning that customizes teaching to individual needs
- Multiple models but all assert there are many ways to study and learn
- Controversial as to whether this makes a significant difference
Universal Instructional Design

- Teaching process that considers the needs of all learners
- Learning activities that are:
  - Accessible and fair
  - Flexible
  - Explicit
- Environment that is:
  - Supportive
  - Accommodates multiple teaching styles
  - Safe – tolerant of errors
  - Appropriate size and space
Review All the Data!

Create a more equitable learning environment!

Classroom and textbook environmental scans
IAT results and classroom data
Peer observations and climate surveys
• Utilize either virtual or hands-on activities.
• Avoid over-using worksheets as a teaching tool.
• Utilize real-life teaching strategies relevant to your students.
• Incorporate student experiences and culture in the instructional process.
• Provide students with periodic opportunities to share anonymous feedback.
• A diversity of learners will benefit from the diversity of strategies for conveying information in the classroom. For instance, consider how you might deliver a lesson using the following:
  – Collaborative learning
  – Problem-based learning
  – Direct instruction
  – Inquiry training
  – Non-directive (facilitative) teaching and self-esteem building
  – Synectics or creative thought whereby students “break boundaries” in problem solving and writing
  – Group investigation
  – Role playing
As your racially diverse students enter your classroom you overhear them talking about the sports game they attended the previous night at a nearby private school. They are talking about the “rich kids” and the inequities they experienced in terms of playing fields, uniforms, bathroom facilities, and even parents’ cars. As you bring your class to order, one female asks why they have to pay attention to math as they will all end up working at a fast food restaurant anyway. The rest of the class nods, smiles, and affirms the position. They then look at you for a response. You have a lot of content material to cover.

• How do you handle this situation?
• Might your perspective change as you take an equity approach?
Wrap-up
Effective teaching includes the recognition of the spheres of influence that address equity.
Teachers have the ability to identify their specific spheres of influence to improve equitable learning for every student with particular emphasis on students who are under-represented in STEM.
Teachers will use a variety of tools address the classroom and academic and engage in greater self-reflection about their practices to create an inclusive environment for all students.
Moving Forward

- Perform peer observations and have a peer observe you
- Perform an environmental scan
- Collect both qualitative and quantitative data to determine what inequities may exist in your classroom
- Develop a hypothesis for what you think may be contributing to these inequities
- Experiment with a variety of strategies to see if you can find one that works for you and your students
“Never doubt that a small group of thoughtful committed people can change the world.

Indeed, it is the only thing that ever has.”

Margaret Mead