

What is equity? A look into a reform math classroom

This session is intended to address equity related issues that surface in standards based reform mathematics classrooms. Issues of teacher and student learning are also addressed along with discussions around specific equity issues that participants face in their school and classroom environments. This session is intended to be used with a wide range of audiences - teachers, staff developers, administrators and district leaders. This session is intended to be 2 hours in length.

(Note: in this workshop, standards based reform (or reform) is used to describe classrooms and methodologies that utilize an inquiry based approach to teaching and learning. The standards referred to are the National Council of Teachers of Mathematics (NCTM) Principles and Standards for School Mathematics (2000).

The beginning of the session asks participants to reflect on their own experiences in math class and to relate this to the experiences that their students face in reform-based mathematics classrooms. Then, they will consider specific equity issues that arise and brainstorm ways to work through these issues. A discussion around notions of equity and equality will follow. Finally, participants will be asked to create a plan of action and identify people with whom they will share their thinking and questions.

This session will help participants think of the particular nuances inherent in classrooms using math reform curricula, identify equity issues to explore and develop ways of bringing other people into the conversation.

Preparing for the session:

Become familiar with the following parts of the workshop session:

Transparency 1: Opening quote from Robert Moses

Transparency 2: Definitions of Equity and Equality

Transparency 3: Equity questions for small group work

Transparency 4: Closing questions

Read:

“Conceptions of Equity” by Walter Secada

“The Equity Principal” (NCTM 2000)

“Uncovering Bias in the Classroom: A Personal Journey.” By Maryann Wickett

“Creating New Inequalities Contradictions to Reform” by Linda McNeil

Make copies of the following:

Handout 1: Definitions of Equity and Equality

Handout 2: Conceptions of Equity (optional)

Handout 3: Equity questions for small group work

Handout 4: Uncovering Bias in the Classroom: A Personal Journey by Maryann Wickett

Handout 5: (*optional*) Creating New Inequalities (Contradictions of Reform) by Linda McNeil

Handout 6: Equity Principle, NCTM 2000

Activity 1: Introduction and context for talking about equity (20 min.)

Show the following quote on transparency 1:

“In today’s world, economic access and full citizenship depend crucially on math and science literacy.”

-Robert Moses, *Algebra Project. Bob Moses Empowers Students*, New York Times, Education Life. January 2001

The goal of this session is to think together about ways to develop the mathematics and science literacy of *all* students. Bob Moses, a longtime civil rights worker and founder of the nationally acclaimed Algebra Project often frames this topic by stressing that “mathematics is the new civil rights prize”.

The standards based reform movement was formed because of the disparities and educational chasms that exist between wealthy and poor schools, urban and suburban schools. Researchers, teachers and educational leaders decided to focus on the content of mathematics instruction and not simply rote procedures that leave many students unable to make connections between mathematical relationships.

When you reflect on who typically did well in more traditional classrooms, it was usually the student who was great at memorizing facts. Often it did not have much to do with whether students understood the mathematics or not. In American schools, students who continue to do the best are by-in-large White males from high socio-economic families to the exclusion of girls, people of color and students from lower socio-economic families.

Together we will explore the notion of how working in more reform-based ways can help “level the playing field” for *all* students, particularly those from low socio-economic families, students whose first language is not English, girls and children of color. By looking closely the equity issues inherent in mathematics education and the ways in which reform math curricula address many of these issues, we can stem the “rising tide of mediocrity” identified in *A Nation at Risk*:

The Imperative for Educational Reform (National Commission on Excellence in Education, 1983) and later revised in *A Nation Still at Risk* (1998).

In order to begin thinking about equity issues in reform-based mathematics classrooms, I would like for you to think about what math class was like for you as a student in elementary school.

(Note: This reflection does not have to be tied to a particular grade. If asked, tell participants to think about when they were the age of the students currently in their class.)

Offer participants a chance to jot down a few notes or to reflect quietly before beginning the discussion. As participants share their reflections, record their thinking on a transparency or chart paper that has been divided into two columns, as below.

After recording and discussing the characteristics of math class when participants were students on the “own experiences” side of the chart, ask them what math class is like for their students. In essence, what are the characteristics of their own classrooms? This feedback is then recorded on the “students’ experiences” side of the chart. (Save and post this chart for use in subsequent activities.)

Here is a sample:

Own Experiences	Students’ Experiences
Students sitting in rows	tables or desks arranged in clusters or moved to clusters when working on an activity
One right answer	multiple strategies and solutions to problems
Teacher in the front of the room	teacher walking around working with students individually and in groups
Students going to the board to work on a problem while the other students looked on	students working with manipulatives and sharing strategies and solutions in cooperative groups
quiet classroom with students working independently	noise level varies with activities

red marks for solving problems in a different way than prescribed by the teacher	students sharing strategies and defending their thinking
hoping that I wouldn't get called on because I didn't know how to do the problem and would be embarrassed	mistakes are valued and part of the culture of learning in the class
I loved it because I knew how to do the right procedures	students understand procedures and context of problems
math was boring	students are excited to do math

After the chart is completed, begin a conversation focusing on the similarities and differences on either side of the chart.

Let's look at both sides of the chart and think about how equity and access is promoted or impeded for students. Are there any major areas of difference that stand out? How do the "newer" ways of working (i.e. reform based) address issues of equity in your classrooms?

At this point, participants usually bring up issues from the list such as:

- Math class seemed to be more equitable (in my own experience) since everyone was doing the same thing at the same time.
- It seemed equitable that everyone had an equal chance of getting the right answer when I was in school but I always solved the problem in a different way than the teacher and other students. My strategy wasn't "right" and I was marked down because of it. Today's students have more access because there are different approaches that are valued.
- In my own classroom, students work in cooperative groups, which helps them, explain their strategies to each other.

Activity 2: Equity vs. Equality (30 min.)

We have shared our experiences through several scenarios illustrating differences in traditional and reform-based classrooms. There are two words frequently used when talking about both models: "equity" and "equality".

Oftentimes we think of these two things (equality and equity) as being the same. Yet there are differences in what they mean and in the implications each has for

classrooms. Let's look at definitions of equality and equity in the context of our previous discussion.

(Note: these are only two definitions. Researchers themselves don't even agree on a single definition.)

Hand out definition of equality and equity sheet and put on the overhead projector. Transparency 2, Handout 1.

- Equality means treating all students the same. Examples of this are: (1) Same required courses; (2) Same assignments; (3) Same assessment criteria; (4) Same amount of teacher time spent for each student.
- Equity means treating students fairly by taking into account differences. Examples of this are: (1) Different ways to demonstrate mastery; (2) Tailoring instruction to students' various learning styles; (3) Varying teacher time and help depending on students' needs; (4) Providing bilingual curriculum materials to students whose first language is not English.

Have a brief discussion around the ideas of equity and equality and point out that participants will have an opportunity to think about it more during the next activity. Relate the two concepts back to the "then and now" list. Talk about how traditional classrooms tend to focus more on equality, while standards-based classrooms tend to focus on equity.

Optional-if time permits

Note: If you do not have time to conduct the entire workshop, omit this activity. At the end of the workshop session hand out Conceptions of Equity by Walter Secada. (Handout 2)

Looking at classrooms in terms of equity and equality characteristics is one way to approach the topic. There are other perspectives that you may want to consider. Walter Secada, Professor of Curriculum and Instruction at the University of Wisconsin-Madison has developed definitions of equity that are worth investigating

Distribute copies of Conceptions of Equity (Handout 2) to participants. Give them a few moments to read this document and then ask them to discuss the following question at their tables:

- What do you see as the benefits or drawbacks to each of the conceptions?

After participants have had a chance to discuss the 6 definitions that Secada illustrates move into the next activity. You do not need to conduct a whole group discussion after this activity.

Activity 3: Thinking about our classrooms (30-min.)

Secada (and others) have spent a great deal of time thinking and conducting research regarding the benefits of math reform. Many of the characteristics of reform math curricula were included in the NCTM Standards (2000) as a way to get more students engaged in high quality mathematics learning. We have already discussed our own experiences in math class and related this to our students' experiences in math class. We will look at the chart created in the first activity in order to think more about specific equity issues relevant to your classroom and school.

Look back at the chart from Activity 1. Sort the items on the chart into themes. Participants will choose a theme they want to focus on and be grouped with others who want to discuss the same theme.

Here are sample themes: *Feel free to add others as they surface in the workshop.*

- problem-solving strategies
 - one right answer
 - knowing procedures
 - getting lower scores on tests because the problem was solved in an unconventional way
 - discussing multiple strategies in small group and with the whole class
- the role of the teacher
 - the teacher moves around the classroom helping and checking in with students
 - the teacher typically had the answer “guess what the teacher is saying”
 - the teacher is responsible for understanding math content and pedagogy
- classroom management/climate
 - students sitting in rows
 - quiet classroom
 - materials are accessible to students
- grouping of students
 - students work in cooperative groups
 - students typically worked alone
- assessment
 - getting graded on math tests
 - portfolio assessment
 - having students better understand their own mathematical progress
 - correlating grades on report cards with anecdotal records and evaluation of student work

- classroom discourse
 - students regularly discuss ideas and strategies with each other
 - mathematical relationships are also explored in other curriculum areas
 - not allowed to share answers or talk during math class

Try to keep groups to about 4 or 5 participants. Two or more groups can discuss similar topics if the interest is there. Be sure that someone takes notes and is able to report back to the whole group. Suggest that each group choose one item to share with the large group and encourage the other workshop participants to comment and give feedback to each presentation.

In your group, think about the equity issues related to your chosen topic. What have your experiences been in establishing an equitable classroom in terms of your topic? What are the benefits of working equitably? What's been a challenge? How does the curriculum support equity in terms of your topic?

Show transparency 3 and then give each group a copy of the questions. (Handout 3)

Note: Be sure to remind participants that everyone should have an opportunity to talk in their small group. As a facilitator, it is important that you circulate between groups in order to redirect them to the task of thinking about how the curriculum supports equity regarding their group topic.

Activity 4: Share back (30 min)

Each group is going to share one of the equity issues related to the theme discussed in the small group. As a large group, we will offer feedback and share strategies around supporting an equitable classroom environment in math.

The discussion should go beyond looking at the lists that groups may have created. Try to go in-depth on some of the equity issues and questions that participants share. Use the group to facilitate the discussion rather than you (as the workshop leader) dispensing information. Remind participants that they should use each other to brainstorm solutions and to think more deeply about the equity issues that come up.

Here is a sample discussion:

Report from group 1: "We talked about ways of grouping students. Most of us group students according to ability level. That way we can give specific help to the students that need it."

Workshop Leader (WL): *“What about the rest of you? How do you group students?”*

Other people comment that they use cards to randomly assign students, use a class list or have students pick their partners and groups.

WL: *“It seems that different model (ways of grouping students) are used at different times.” In thinking about grouping by ability levels-what equity issues come to mind?*

Participant: *“Well, if you don’t group by ability level then the gifted kids are going to be bored.”*

Participant: *“Maybe. However, if you group homogeneously then students don’t have the opportunity to hear about strategies that they may not have thought of. I’ve seen kids at the higher end have their thinking stretched by student who usually struggles in math.”*

Participant: *“I make sure to have an equal number of girls and boys in each group so that it’s fair.”*

WL: *“We’ve heard a lot of strategies and reasons behind various ways of grouping students. One person says that they group by ability and another makes sure there is a gender balance and still others may assign students to random groups. If the goal of reform-based instruction is to tailor instruction to each student’s needs, how do each of these strategies support or limit this goal?”*

Participants comment.

In the above conversation, the workshop leader does not give an answer but rather redirects the participants to further explore issues of equity related to the topic.

Activity 5: Measuring change (10 min.)

We have only begun to scratch the surface in talking about equity issues in our classrooms and schools. This session is coming to a close. Yet, I would like for you to reflect on your ideas coming in and your ideas and questions as you leave. For the next ten minutes or so, I would like for each of you to focus on the following questions:

- § How does your thinking about equity manifest itself in your classroom?
- § What issues are you going to continue to investigate?
- § How and with whom are you going to continue work on equity and its’ relation to classroom pedagogy? (Plan at least one concrete next step, one main question or concept that you will share with a colleague.)

Write about these questions and develop a plan for sharing ideas (show these questions- transparency 4)

When participants have finished freewriting, hand out Wickett article (Handout 4) as an example of what can happen when you start to look more closely at your classroom. Also, at this time you can handout, Creating New Inequalities (Handout 5-optional) and The Equity Principle –NCTM (Handout 6-optional)

This session can't touch on all of the equity issues in standards-based classrooms. It is meant to be a starting point (or a point along the continuum) for reflection and discussion. Hopefully you will leave this session committed to the idea of mathematics and mathematical literacy as a civil rights issue for all of the students in your classroom.

Participants fill out evaluations.

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Handouts and Transparencies

Transparency 1: Opening quote, Bob Moses
Transparency 2: Equity and Equality definitions
Transparency 3: Equity questions
Transparency 4: Closing questions

Handout 1: Equity and Equality definitions
Handout 2: Conceptions of Equity by Walter Secada (optional)
Handout 3: Equity questions for small group work and large group discussion
Handout 4: Uncovering Bias by Maryann Wickett
Handout 5: (optional) Creating New Inequalities, Contradictions of Reform by Linda McNeil
Handout 6: (optional) Equity Principle, NCTM 2000

Read these for background information before the session begins:

Handout 2: Equity Principal (NCTM 2000)
Handout 3: Conceptions of Equity by Walter Secada
Handout 5: Uncovering Bias by Maryann Wickett
Handout 6: Creating New Inequalities Contradictions to Reform by Linda McNeil

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References

A Nation at Risk: The Imperative for Educational Reform (National Commission on Excellence in Education, 1983)

A Nation Still at Risk (1998)
<http://edreform.com/pubs/manifest.htm>

Anyon, J., Social Class and the hidden curriculum of work. *Journal of Education*, 163,67-92.1980

Kozol, J., Savage Inequalities: Children in American Schools. New York; Crown, 1991

Moses, Robert, Radical Equations, Beacon Press, 2001

National Council of Teachers of Mathematics, Principles and Standards for School Mathematics, 2000

Sadker, M., & Sadker, D. Failing at Fairness: How America's Schools Cheat Girls. New York, Charles Scribner's Sons.1994

Weaving Gender Equity website <http://www.terc.edu/wge>

Transparency 1

“In today’s world,
economic access and full
citizenship depend
crucially on math and
science literacy.”

-Robert Moses, *Algebra Project. Bob Moses Empowers Students*, New York Times, Education Life. Jan.2001

Definitions of Equality and Equity

Equality refers to treating all students the same.

- Same required courses
- Same assignments
- Same assessment criteria
- Same amount of teacher time spent for each student

Equity refers to treating students *fairly* by taking into account differences.

- Different ways to demonstrate mastery
- Tailoring instruction to students' various learning styles
- Varying teacher time and help depending on students' needs
- Providing bilingual curriculum materials to students whose first language is not English.

Adapted from Laboratory for Educational Improvement of the Northeast and Islands (1995). Activity 2: Science and mathematics for all in *Facilitating Systemic Change in Science and Mathematics Education: A Toolkit for Professional Developers*. Andover, MA

Transparency 3
Handout 3

What have your experiences been in establishing an equitable classroom in terms of your topic?

What are the benefits of working equitably?

What's been a challenge?

How does the curriculum support equity in terms of your topic?

Transparency 4

How does your thinking about equity manifest itself in your classroom?

What issues are you going to continue to investigate?

How and with whom are you going to continue work on equity and its' relation to classroom pedagogy? (Plan at least one concrete next step, one main question or concept that you will share with a colleague.)