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NCTM Annual Meeting and Exposition in San Antonio, TX

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Sessions 273

Making It Happen: Engaging All Students, Especially Those Who “Hate” Math

For too many students, mathematics means confusion, failure, heartache, and feeling like a “dummy.” Rather than risk failure or looking dumb, they simply choose not to “play” the game of school. In this presentation, participants will learn to use strategies of an equity pedagogy framework for engaging all students, especially those who “hate” math.

I C U CARE Framework

Principle	Description/Questions to Consider
I nclude others as experts Walk Around Survey	Create classroom environments that extend beyond the teacher as the sole authority to develop competence and confidence in others as experts, including the students themselves. - How might you encourage students to view other classmates as experts? - How might you broaden student views of who is an expert in the class beyond beliefs about race, class, or gender?
Be C ritically conscious	Take the time to understand how negative stereotypes impact your students and actively work to erase the effects of those negative stereotypes on the educational outcomes of diverse learners. - How might negative stereotypes influence my interactions with low status students? - How do I make sure that all my students (both high and low status) participate equally in class and group discussions?
U nderstand your students Student interest inventory	Learn about your students, their families and their communities for the purpose of improving instruction. (<i>Not making assumptions</i>) - What attitudes and beliefs do I have that inhibit my ability to get to know my students more broadly? - How can I create learning contexts for my students that will help them engage more meaningfully with the mathematics they need to learn?
Use C ulturally relevant curricula EOC Math Project	Use instructional materials in ways that help students see themselves as doers of mathematics, and help them overcome the negative stereotypes and messages regarding who is mathematically smart. - In what ways can I help my students see themselves in the mathematics curriculum (textbooks, assessments, software, supplemental print and digital materials, etc.) - How can I engage all my students with the mathematics curriculum in ways that help them overcome the negative stereotypes and messages regarding who is mathematically smart?
A ssess, activate, and build on prior knowledge Guess that Word!	Value the prior knowledge that students bring to the classroom, both personal and cultural, and use that knowledge as a resource for creating new knowledge. - How can NOT taking the time to assess or activate the prior knowledge of my students perpetuate inequities in my classroom? - How can I use the productive struggle of problem solving to assess, activate, and/or build my student’s prior knowledge?
R elease control VANG Game	Empower your students to take ownership of their own learning by focusing on sensemaking, and allow them to make choices about things that are important to them in the classroom. - What keeps me from giving more control to my students for their learning? How can I overcome these obstacles? - How do I remove the fear of making mistakes from my classroom?
E xpect more 4 R’s of Academic Discourse	Hold high expectations for all students, and avoid deficit views of diverse learners. - What behaviors of mine communicate low expectations to my students? - How can I make sure I do not lower the cognitive demand made on my students when they struggle?

Based on *Seven Principles of Equity Pedagogy* (Seda Dissertation, 2007)

Resources can be found at <http://www.sedaeducationalconsulting.com/resources/>

WALK AROUND SURVEY

NAME _____

TOPIC: _____

DATE _____

Informer	Fact #1	Fact #2	Fact #3

Go back to your notes and check the facts.

Briefly summarize what you have learned from your student informers:

What questions do you still have?

Name _____ Date _____
Partner's Name _____

Coordinate Algebra End-of Course Test Project

- Use the 2014 Coordinate Algebra EOCT data in the table below to create two lists with a TI-84 calculator.
- Create a scatterplot of that will help us predict the percentage of students passing the 2014 Coordinate Algebra EOCT given the percentage of Black students at the school.
- Determine the regression equation and correlation coefficient.
- Use your scatterplot and regression equation to answer the following questions:
 1. What type of correlation do you notice? Strong or weak; positive or negative. Explain.
 2. Which schools seem to be significantly above your trendline? Which schools seem to be significantly below your trendline? What do you think was different about these schools that caused them to be significantly above or below the trendline?
 3. Use your regression equation to predict the percentage of students passing the 2014 Coordinate Algebra EOCT for SWD. How close was the actual passing rate to the predicted rate? Was it higher or lower? Why?
- Write a paragraph (*at least 5 sentences*) summarizing your thoughts about this data. Be sure to include answers to the following questions: What recommendations would you make to the incoming freshman for improving the Coordinate Algebra EOC passing rates next year? What recommendations would you make to the math teachers for improving the Coordinate Algebra EOC passing rates next year? What recommendations would you make to the administrative team for improving the Coordinate Algebra EOC passing rates next year?

<u>Schools</u>	<u>%Black</u>	<u>%passing</u>
Arabia Mountain High	96%	26%
Cedar Grove High	98%	29%
Chamblee High	46%	56%
Clarkston High	62%	18%
Columbia High	98%	10%
Cross Keys High	11%	37%
Dekalb Alternative High	88%	9%
DeKalb School of the Arts High	88%	81%
DeKalb Early College Academy	57%	52%
Destiny Academy	98%	0%
Druid Hills High	53%	32%
Dunwoody High	22%	42%
Lakeside High	30%	36%
Lithonia High	93%	21%
MLK High	96%	13%
McNair High	98%	11%
Redan High	94%	37%
Southwest DeKalb High	97%	11%
Stephenson High	95%	28%
Stone Mountain High	82%	17%
Towers High	95%	11%
Tucker High	65%	20%

Guess that Word!

Unit 1 Dimensional Analysis	Unit 1 Unit
Unit 1 Variable	Unit 1 Expression
Unit 2 Formula	Unit 2 Equation
Unit 2 Inverse	Unit 2 System of Inequalities
Unit 3 Function	Unit 3 Slope
Unit 3 y-intercept	Unit 3 Growth rate

Unit 4 Univariate data	Unit 4 Bivariate data
Unit 4 Mean absolute deviation	Unit 4 Correlation
Unit 5 Isometry	Unit 5 Translation
Unit 5 Rotation	Unit 5 Reflection
Unit 6 Parallel lines	Unit 6 Perpendicular lines
Unit 6 Same slope	Unit 6 Opposite reciprocals

4 R's of Academic Discourse

1. **Respond**: “My answer is ..., because ...”
2. **Restate**: “What I heard you say was ...”
3. **Reinforce or Rebut**: “I agree because ...” or “I disagree because ...”
4. **Report (SMP)**: “... used SMP# ... when he/she ...”



Adapted from Lisa Arter, assistant professor of English at Southern Utah University:

<http://www.ascd.org/publications/newsletters/education-update/feb15/vol57/num02/Calling-Mulligan!-Two-Rules-for-Dynamic-Discourse.aspx>