

CRE Mathematics Training
Session One

Presented by
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Quote from a ‘friend’ ...

“You see, Dante, the problem with you Mathematics Educators is that you think you can make everyone a Mathematician. I mean its like trying to teach everyone how to be a novelist. Just like everyone cannot write the Great American Novel, everyone cannot be a mathematician.”

~ Delivered by a colleague at the Joint Math Meetings in San Francisco, 2010



Goals of this series of 4 PDs

- We want to transcend the current narrative related to the learning of mathematics, teaching, and assessments via CRE

Structure of this PD

- Introduction to CRE for mathematics classrooms.
 - CRE Framework
 - Danielson's Framework
 - Curriculum Tuning Document
 - Other Literature related to CRE & Mathematics Education

- Mathematical competencies found in Problem/Project Center Learning
 - Example of CRE and Inquiry
 - Circle Problem
 - Jibril's Problem
 - HRASE Questioning Sequence
 - High Order Thinking Rubric

- Teachers' Action Items
 - Identify where they will be by the time of lesson implementation
 - Identify the competencies and possible CRE structures



Exploring Inquiry Based and Project/Problem Centered Learning & Promoting Socio-Cultural and Equity Promoting Curriculum

- A brief survey of the field (Foundation):
 - ▣ Ethnomathematical Perspective
 - ▣ Culture and Language
 - ▣ Politics and Policy Mathematics Education
 - ▣ Assessments of Mathematical Proficiencies

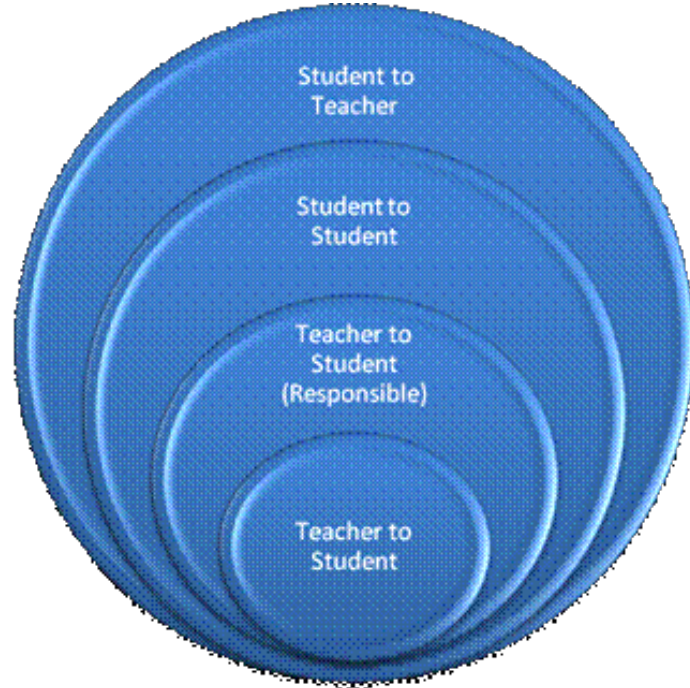
CRE Framework

- Introduction to CRE for mathematics classrooms.
 - ▣ CRE Framework
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Major Theoretical Framework Influences

- Danny B. Martin
- Na'ilah Saud Nasir
- Pedro A. Noguera
- Carol Dweck
- Rochelle Gutierrez
- Robert Q. Berry

Discourse Domain



Discourse Patterns

- Many mathematics classes might be dominated with the monologue of the teacher; direction of the conversation is towards the students. The next slide provides a framework that depicts a shift of dialogue in the mathematics classroom, or classroom conversation in which the discursive nature between teacher and student are fluid and shift based on the role that the students and teachers have in the conversation:

Continued

- ❑ Teacher to Student (teacher starting and carrying the conversation with the student; which is the lowest level discourse);
- ❑ Teacher to Student (Teacher starting the conversation with student; that student responsible maintaining fraction of conversation);
- ❑ Student to Student (students conversing about mathematical ideas); and
- ❑ Student to Teacher (student starting conversation with teacher; both equally responsible for keeping the conversation going; which is the highest level of discourse) (Tawfeeq, 2009).

Student are engaged in this project based learning through

- Working in cooperative groups
- Solving problems where solutions are not apparent (Non routine problems)
- Communicating mathematically (Cognitive fluidity in mathematical discourse)
- Becoming more cognizant of and develop an appreciation of the applications of mathematics via real world phenomena
- Work on problems provided a range of potential solutions
- Created word problems with instructors support

Now for you to do

- ❑ The Circle Problem
- ❑ Making the ‘Jibril Problem’ better
- ❑ Making the ‘City Project’ better
- ❑ Higher order thinking rubric foundation document for Mathematics.
 - ❑ Soft Skills
 - ❑ Hard Skills

Teachers' Action Items

- Identify where they will be by the time of lesson implementation
- Identify the competencies and possible CRE structures