MAKING MATHEMATICS FAMILIAR: INCREASING INTEREST AND ACHIEVEMENT THROUGH CULTURAL RELEVANCE

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STEM Interest Declines from Middle School among All Students but…

- Female students' interest in STEM declines more than male students
- African American and Latino/a students report lower levels of interest in STEM than others

(Some) Reasons

- Lack of relevance, meaning
- Less opportunity for personal involvement
- Implicit Bias and Stereotype Threat

→ Less confidence in abilities; lower achievement

AAUW (1995); Eccles, et. al. (1995); Amitza, et. al. (2009); Sanders & Nelson (2004)

Aims of Culturally Responsive Mathematics Teaching

- **Promote deep, meaningful mathematics learning**
- **Value students' sense of identity**
- **Build on students' cultural assets**
  - linguistic and ethnic patterns of interaction
  - aspects of familial and community knowledge and lived experiences
  - "the behaviors, beliefs, and artifacts of the communities of the particular students in a particular classroom" (Ensign, 2003, p. 415)
- **Expand students' sense of possibility**
- **Empower students to analyze issues and generate solutions**

Funds of Knowledge/ Culture or Community Support

- **How does my lesson help students connect the content with relevant/authentic situations?**

1	3	5
No evidence of cultural/ community connection; "culturally neutral" context	At least one sustained example of connecting math to students' interests/culture /community	Intentional connections to interests/culture/ community throughout the lesson; Understanding of math and of culture/community are deepened, extended

From Aguirre & Zavala, 2013 and TEACH MATH

Power and Participation

- **How does my lesson distribute math knowledge authority, value student math contributions, and address status differences among students?**

1	3	5
The authority of math knowledge exclusively resides with the teacher who has the final word about correct answers. Student math contributions are minimal. Status differences are evident.	The authority of math knowledge between teacher and students is sporadically shared. At least one instance where multiple contributions are accepted and valued. At least 1 strategy to minimize status differences.	The authority of math knowledge is widely shared between teacher and students. Mathematical contributions are actively elicited from students and all are valued. Multiple strategies to minimize status among students are evident.

From Aguirre & Zavala, 2013 and TEACH MATH

Use of Critical Knowledge/Social Justice

- **How does my lesson support students to use what we have learned as a vehicle to understand, critique, and change an important issue in their lives?**

1	3	5
No evidence of connection to critical knowledge	There is at least one instance of connecting mathematics to analyze a sociopolitical/ cultural context.	Deliberate and continuous use of mathematics as an analytical tool to understand an issue/context, formulate math-based arguments to address the issues and provide substantive pathways to change/transform the issue.

From Aguirre & Zavala, 2013 and TEACH MATH