Math as a Cultural Product, Practice, and Perspective

Dr. Wendy Xiao Liu

Chinese Language Teacher,
Tower Hill School, Delaware

Former Chinese Field Agent,
Delaware Department of Education
Ethnomathematics

- The numerals and naming systems
- The history of mathematics
- The mathematics of different cultures
- The philosophy and cultural natural of mathematics
- Mathematics education
- Political mathematics
International Service-Learning for Preservice Teachers: Strengthening Mathematical Literacy in West Africa

Relationships Between the Hopi Calendar and Measurement Concepts

The *Quinceañera* Event: Pre-service Teachers Implementing a Culturally Relevant Math Activity in a Hispanic Community

Public Good or Private Commodity?

Mathematics Education in Japan and Implications for the U.S.
My Focus Today
Key Questions:

How is math taught and learned in the Chinese education system? What are the perceived strengths and weaknesses?

How is math taught and learned in the US education system? What are the perceived strengths and weaknesses?

How can US and China learn from each other?
viewed as “passive transmission” and “rote drilling” (Gu, Huang & Marton, 2004).

do not see repetition and understanding as separate as interlocking processes, complementary to but rather each other (Waktins & Biggs, 2001).

construct a conceptual understanding of mathematical symbols and rules before they practice the rules (Li, 2006).

understand rather than to memorize. (Purdie, Hattie & Douglas, 1996)
Strengths

**Standardization**
- Curriculum and other instructional materials, including lesson plans
- Assessments
- Instructional procedure

**Mastery**
- Teacher preparation – mastery of content
- Single subject devotion
- Students’ proficiency in basic knowledge and skills

**Cultural factors**
- Teacher’s authority and social status
- Parents and teachers’ beliefs and expectations
- Teacher evaluation, peer observation, lesson study
Areas for Improvement

Teaching Practice
- Teacher-centered. Lack of students’ active participation
- Lack of differentiated instruction
- Lack of effective use of manipulatives

Curriculum
- Lack of integration of literacy and math
- Emphasis on results rather than procedure

Assessment
- Heavy emphasis on paper tests rather than application
- Lack of variety of assessment
Strengths

- Availability of instructional resources
- Flexibility in promoting understanding and communicating in math
- Students’ Engagement
- Literacy integration
Improvement

- Teachers’ mastery of content
- Students’ proficiency in basic math facts
- Higher Expectations and More Individualized Support
High expectation
Increase teachers’ mastery of content
De-privatize classroom; encourage peer observation

Learning from Each Other!

Differentiation
Procedure + results; Literacy integration
Varied assessments; more application
Math teaching and learning are strongly influenced by contextual and cultural factors.

The Chinese and American approaches to math education are different, although there are similarities. Each has distinctive strengths and weaknesses.

It is important to probe deeper into the perspectives and practices beneath the surface. Be open-minded to learn from each other.
Wendy Xiao
Liu 刘晓
e-mail: wendyxl2009@gmail.com