


Expanding a Cultural Awareness Unit for Preservice Mathematics Teachers

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Overview

- Background of the Unit
- Description of the Unit
- Research on the Unit
- Current Status and Next Steps
- Questions and Suggestions

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- The changing demographics of US public schools have placed increased attention on preparing preservice teachers to teach culturally, linguistically, and economically diverse student populations.
 - In mathematics education this is particularly important given the differential achievement of students and the need to provide all students with more equitable classroom experiences.

What is culture?

Culture is the consistent ways in which people experience, interpret, and respond to the world around them; It represents the “ways of being” of a collective population...

[E]lements of culture include: food, language, music, and beliefs about good and evil... Culture is a feature of all human groups and is shaped by historical, social, political, economic, and even geographical factors.

Additionally, culture is often reinforced (positively) through our contacts with societal institutions. Whether we experience such reinforcement, however, largely depends on the status position of the cultural group to which we belong.

Marshall (2002)

A few common features of culture...

- **Culture is learned**, therefore it is adaptable and vulnerable to changes.
- Substantive cultural **changes rarely occur** quickly or easily.
- Through conscious (and sub-conscious) resistance, **people tend to defend and protect their culture**.
- **Our own cultural ways** of being tend to strike us as ordinary, usual, and **normal**. Consequently, we are often oblivious to the peculiarities of our own culture.
- It is not uncommon for **other people's cultural ways** of being to strike us as **quaint, strange, or even pathological**.

Marshall (2002)

- ➔ **Multicultural mathematics dispositions** are intended to encourage mathematics teachers to see mathematics as a cultural activity and their role as a mediator between students' culture and mathematical learning.

Multicultural mathematics dispositions are characterized by three dispositional factors:

- *Openness* is receptiveness to the role of culture in teaching and learning mathematics.
- *Self-awareness/self-reflectiveness* is understood as perceiving the differences between one's own culture and other cultures.
- *Commitment to culturally responsive mathematics teaching* as the explicit intention of teachers to use culturally responsive strategies in the classroom.

Goals of the Cultural Awareness Unit

We want preservice teachers' to:

- Examine the role of culture in the teaching and learning of mathematics and how students' cultures can be used to teach mathematics.
- Reflect on their own views about culture and they ways they experienced learning mathematics.
- Become aware of stereotypes about who can do mathematics
- Have an activity they can use to teach mathematics.

The Cultural Awareness Unit

Taught in Mathematics Methods Courses for Preservice Teachers at all levels: Elementary, Middle, and Secondary

Time Frame: \approx 3 hours

Consists of three components:

1. Article search and critique
2. Class discussions
3. Post-discussion reflection

Components of the Unit

Component	Activities
Article search and critique	<ul style="list-style-type: none">• Search for an article about teaching and/or learning mathematics to students who are culturally different than themselves.• Write a critique about the article and strategies for teaching this diverse population.
Class Discussion	<ul style="list-style-type: none">▪ Share cultures and strategies discussed in article.▪ Define culture and create cultural tool list.▪ Discuss how culture relates to mathematics classrooms.▪ Discuss stereotypes.
Post-discussion reflection	Write an overall reflection on unit by sharing what they learned, understood, and realized about the role of culture in the teaching and learning of mathematics.

Research on the Unit

- The goals for this project are to revise, implement, and research a cultural awareness unit in a mathematics methods course to support preservice teachers' (PSTs) development of MCMD.
- The specific objectives to achieve the goals are.
 - **Revise** the cultural awareness unit based on questionnaire responses from former PSTs.
 - **Implement** the revised unit with mathematics PSTs.
 - **Research** the impact of the unit on mathematics PSTs' cultural awareness/MCMD.

Research Methodology

Phase	Activities	Assessment
Phase 1	<ul style="list-style-type: none">• Locate former PSTs• Create, administer, and analyze the survey based on the original unit• Conduct focus group with In-service STEM teachers	<ul style="list-style-type: none">• CAS Survey• Semi-structured interview questions.

Cultural Awareness Survey (CAS)

- 15 minute on-line survey via Qualtrics
- Four parts:
 1. Becoming Culturally Aware
 2. Becoming More Prepared to Teach Mathematics to Diverse Students Populations
 3. Benefits and Drawbacks of the Unit
 4. Demographic Information
- 34 items
 - 29 on a Likert-type scale
 - 5 open ended

Cultural Awareness Survey



Class Discussions

B. To what extent do you agree/feel that each activity below helped you to become more culturally aware?

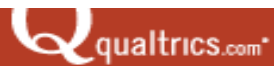
	Strongly Disagree	Disagree	Agree	Strongly Agree
6. The sharing in class of cultures found in articles.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. The sharing in class of strategies found in articles.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. The definition of culture constructed in class.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. The creation of my cultural toolkit.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. The discussion on how culture relates to mathematics classrooms.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. The discussion on the dangers of stereotyping students in mathematics.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Exploring new strategies.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Reflecting on personal experiences in the mathematics classrooms.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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>> Next

0%  100%

Cultural Awareness Survey



2. What would have benefited you in the class discussions?



5. What other activities would you recommend for inclusion in the cultural awareness unit?

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>> Next

0%  100%

Research Methodology

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Phase 1	<ul style="list-style-type: none">• Locate former PSTs• Create, administer, and analyze the survey based on the original unit• Conduct focus group with In-service STEM teachers	<ul style="list-style-type: none">• CAS Survey• Semi-structured interview questions.
Phase 2	<ul style="list-style-type: none">• Modify unit based on CAS Survey and STEM teachers' focus group• Implement the revised unit• Collect data from Preservice Teachers	<ul style="list-style-type: none">• Article critiques• Audiotaped Class Discussions• Reflection Papers
Phase 3	<ul style="list-style-type: none">• Analyze data from Unit.• Continue to Analyze Survey Data	<ul style="list-style-type: none">• Course artifacts

Current Status

- Located the former PSTs
- Developed and validated the instrument
- Held focus group with STEM teachers
- Completed first component of Unit with two cohorts of PSTs

Next Steps

- Administer the CAS
- Analyze the survey results
- Revise the unit
- Implement Phases 2 & 3 of the unit
- Share our findings with the field

Audience Feedback

Questions
And
Suggestions



Thank You!

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