

Mathematics and Intercultural Competence in the Middle School

Christopher Bennett

Megan Brunner

Kyle Evans

Northeast Mathematics Undergraduate Research Mini-Symposium

July 28, 2015

UConn

Overview

- Intercultural Competence
- Motivation
- Survey
- Rubric
- Lesson Plans

Intercultural Competence (ICC)

- “A person’s ability to relate to and communicate with people who speak a different language and live in a different cultural context”
- Byram’s factors of ICC
 - **Attitudes**
 - **Knowledge**
 - **Skills of Interpreting and Relating**
 - Skills of Discovery and Interaction
 - Critical Cultural Awareness

Motivation

- Globalization
- Farmington (CT) School District
- Interdisciplinary units
 - ICC focus
 - Assessment
- Math \leftrightarrow ICC

Research Questions

- 1) How can intercultural competence be appropriately assessed within a middle school environment (with a specific focus on sixth grade students)?
- 2) How can intercultural competence be incorporated into K-12 mathematics classrooms?

Survey - Process

- Track ICC development over time
- Existing instruments
- Development
- Dimensions
 - Attitudes
 - Knowledge
 - Mathematics Learning
 - Interdisciplinary Learning
- Consultation

Survey - Results

- Mathematical and Intercultural Awareness Survey (MICAS)
 - 5 demographic questions
 - 33 Likert scale items (5-point scale)
 - 5 open-ended questions

A	I can understand my own culture without knowing about other cultures.
K	I feel that I can clearly explain my culture to a pen pal in another country.
M	I do not need math to understand another culture.
I	I enjoy learning about the same topic in different subjects.
O	What are three things you learned about other cultures in math class?

Survey - Goals

- Administer in upcoming school year
 - Refine through data analysis
- Future uses
 - Other schools
 - Other grade levels

Rubric - Process

- Teacher resource
 - Written responses
 - Classroom interactions
- Existing tools
 - VALUE rubric
- Extremes → Levels
- Consultation
 - Teacher guide

Rubric - Results

- Categories: Curiosity, Openness, Knowledge of Self/Other
- Levels: Insufficient, Developing, Emerging, Proficient

	4 “Proficient”		1 “Insufficient”
Attitudes - Curiosity	Student shows interest in learning about all aspects of different cultures and subcultures. Student asks questions which are able to form discussions among peers.	...	Student lacks interest in learning about cultures. Student asks few or inappropriate questions during class time.

Rubric - Goals

- Application to any content area
- Future uses
 - Other schools
 - Other grade levels

Lesson Plans

- Teacher resource
 - Common Core
 - ICC
- Examples across development
 - 3rd grade – perimeter, area, agriculture
 - 6th grade – surface area, volume, housing
 - 9th grade – linear equations, graphing, populations
- Progression of ICC

Conclusion

- Global Citizenship
- Future Research
 - Data analysis
 - Math \leftrightarrow ICC

References and Acknowledgements

- Byram, M. (1997). *Teaching and assessing intercultural communicative competence*. Clevedon, United Kingdom: Multilingual Matters.
- Byram, M. (2008). *From foreign language education to education for intercultural citizenship: Essays and reflections*. Clevedon, United Kingdom: Languages for Intercultural Communication and Education.
- Rhodes, T. (Ed.). (2010). *Assessing outcomes and improving achievement: Tips and tools for using rubrics*. Washington, DC: Association of American Colleges & Universities.

This research was carried out as part of the 2015 UConn Math REU under the NSF Grant DMS #1262929. We extend our thanks to Dr. Luke Rogers for his supervision of this program, and to Dr. Fabiana Cardetti and Dr. Scott Brown for their assistance in the completion of this project.