INTRODUCTION

*Problem in Textbook: Una lata del número 300 contiene 13 7/8 onzas. Una lata del número 2 1/2 contiene 28 onzas. ¿Cuántas onzas más contiene una del 2 1/2 que una del 300?*

If you are not able to read the problem, then you have some sense of what a language minority student can face in many math classrooms in New Mexico and beyond. If you were able to solve the problem, then you realize the cleverness that students are capable of in attacking mathematical problems in their first language and in other languages.

The purpose of this course is to provide in-service teachers with an opportunity to address issues of diversity with a focus on language and cultural factors that may influence mathematics teaching and learning. The course is also designed to provide information on how children construct mathematical skills and knowledge. Finally, the course will combine research and examples of effective practice in order to help practitioners gain insight into developing successful mathematics classrooms with diverse learners.

To address these issues, we will look at some fundamental questions: What are language and culture? What is mathematics? What is mathematical achievement? What are the relationships between language, culture, and academics? Throughout the course, each student will have the opportunity to address these questions and to think about diverse populations in their own mathematics classrooms.

**COURSE OBJECTIVES**

- Engage in intellectual activity within a community of learners.
- Examine issues of race/ethnicity, class, gender, and language in relation to mathematics curriculum and teaching.
• Explore one’s identity and critically examine one’s lived experiences in the mathematics classroom.
• Research mathematical learning, language education and acquisition, diversity, and mathematics in diverse classrooms.
• Analyze mathematical programs that address diversity (work of effective math researchers/practitioners).

REQUIRED TEXTBOOKS

Course Reader.

RECOMMENDED TEXTBOOKS


RECOMMENDED WEB SITES AND INTERNET LINKS

Obtaining as much information about current affairs related to the schooling of language minority students is important. As such, students are strongly encouraged to get on-line information.

http://www.ncbe.gwu.edu (National Clearinghouse for English Language Acquisition)
http://www.cal.org (Center for Applied Linguistics)
http://www.tesol.org (Teaching English to Speakers of Other Languages)
http://www.nabe.org (National Association for Bilingual Education)
http://www.nctm.org (National Council of Teachers of Mathematics)
http://www.enc.org (Eisenhower National Clearinghouse)

DISABILITY STATEMENT

The University of New Mexico seeks to provide reasonable accommodations for all qualified individuals with disabilities. This university will adhere to all applicable federal, state, and local laws, regulations and guidelines with respect to providing reasonable accommodations as required to afford equal educational opportunity. It is the student's responsibility to register with
Student Support Services and to contact the faculty member in a timely manner to arrange for appropriate accommodations. Please let me know about any special needs as soon as possible.

**COURSE REQUIREMENTS**

**I. Class Attendance, Discussion, and Readings**

Come to class **on time** and **prepared**. All of the readings should be completed before each class session as a basis for an informed and critical analysis of the issues of this course. Advanced preparation for course meetings is particularly important for full participation since many of the class activities will be conducted in small collaborative groups. If you need to be absent more than ONE time, please do not elect to take this course now, but plan to take it another time when your schedule is more conducive.

**II. Mathematical Autobiography**

Describe the salient moments in the development of your own mathematical understanding. To be turned in and shared with class in a five minute informal presentation. *Due June 10. Suggested Length: 3 pages. See guidelines.*

**III. Reflective Journals**

The journal (a 1 ½ to 2 page daily paper) should be a review of the assigned readings taken as a whole. The paper should be a reflection of your critical commentary about the readings and are indicative of your preparation for daily discussion. Strive to be concise and precise in your writing style and in the content of your papers. Before writing, it might help to ask yourself *what you now know* about the issues raised in the readings. You will be responsible for sharing your journal with the class.

The style of your papers may take one of two forms, depending on the readings. First, if the assigned readings are reports of research, then focus your discussion on how the data effect what you know about the teaching and learning of mathematics; what we can learn from these data; and what this inquiry means for our understanding of children’s mathematical thinking and approaches to teaching.

Second, if the assigned readings are of a practice-based or of a theoretical nature, then focus your discussion on the credibility of the ideas presented. Does the author provide data to support claims? Is the theory useful in either classroom practice or future research? Does the theory “ring true” based on personal experience?

Finally, your papers should conclude with at least two questions that the material prompted you to ask. These questions should help you to frame your in-class discussion of the readings. You will receive full credit for completing this assignment. *(Due on June 10 and June 17)*
IV. Research Project

As the major requirement of this course, this project should represent your sustained inquiry into some aspect of the links between language, mathematics, and instruction. Topics are to be decided by you and approved by the instructor. Some examples of topics include the following:

• Ethnomathematics of a particular cultural group
  Research the history of and everyday use of mathematics of a particular cultural group (such as the Yu’pik people’s use of mathematics in counting, building, art, clothing production). Synthesize your findings in a written report. Then create a unit for an age group of your choice which introduces students to this cultural group and allows them to practice mathematical concepts developed by these people. Suggested Length: 20 pages.

• Review of Mathematical Achievements of a Particular Ethnic Group in the U.S. (graduate students)
  Research the mathematical learning of a particular ethnic group—what is known, what remains to be learned. You are responsible for reporting on any information that has been obtained on mathematical learning habits, mathematical performance habits, attitudes, and general approach to school and to school mathematics. Suggested Length: 20 pages.

• Research (perhaps best for students who want to complete a master’s thesis or dissertation)
  Design your own study which addresses a specific area of language and mathematical learning. Begin a literature review, outline methodology, and draft research instruments. Include why the particular line of inquiry is important and possible implications for instruction of various ethnic groups in U.S. schools. Suggested Length: 20 pages.

• Inquiry Project and Social Action Plan (undergraduate and graduate students—the depth of the research will distinguish the projects)
  In embracing the concept of teachers/researchers as active agents of change, develop a 20-page plan of action utilizing at least 10 to 15 references from the class readings to address an issue within urban or rural communities related to language, culture, and mathematics. Identify a problem/issue that concerns you as it perpetuates inequities within the community, the district, the school, and/or your classroom. This inequity can be along social, educational, economic, gender, racial lines, etc. as it intersects with curriculum, pedagogy, and academic achievement. Conceptualize how you would begin to inquire into this issue and draw up a social action plan that outlines a reasonable, workable solution that can be accomplished by you. See guidelines.
  A one-page project proposal is due June 9. Outline your proposed area of inquiry and the products you will create (i.e., written reports, lesson/unit plans, resource lists, games and/or realia, workshop presentations). Conferences during the 4th day of course with instructor will help you refine your inquiry. Your final projects are due June 24.
CLASS SCHEDULE AND ASSIGNED READINGS

Session 1  
June 6  
Course Introduction and some definitions: Diversity, language, culture, and mathematics

Session 2  
June 7  
Review Second Language Development; Interpretation of Mathematical Language  
Readings:  

Session 3  
June 8  
Multicultural Mathematics  
Readings:  
- Zaslavsky, Chapter 1  

Session 4  
June 9  
Symbols for Numbers; Preparing Teachers for ELLs in Mathematics; Representations of Mathematical Concepts and Procedures  
Readings:  
- Zaslavsky, Chapter 5  
- Trentacosta & Kenney, Ch. 17

One-page Proposal for Final Project

Sylvia Celedón-Pattichis  
LLSS 557
Session 5       June 10
Addressing the Needs of Diverse Learners: Part I
Readings:  • Albert, L. R. (2000). Lessons learned from the “five men crew”: Teaching culturally relevant mathematics. In M.E. Strutchens, M. L. Johnson, & W. F. Tate (Eds.), Changing the faces of mathematics: Perspectives on African Americans (pp. 81-88). Reston, VA: NCTM.

1st Reading Journal Due
Mathematics Autobiography Due

Session 6       June 13
Addressing the Needs of Diverse Learners: Part II

Session 7       June 14
Talking to Learn Mathematics: Teachers Create Discourse Communities
Session 8  June 15
Involving the Community in Mathematics
Readings:  • Zaslavsky, Chapter 10
• Watson, B. (1996). A Freedom summer activist becomes a math
  revolutionary. *Smithsonian*, 26(11), 114-125.
• Trentacosta & Kenney, Ch. 15 & 25

Session 9  June 16
Connecting the NCTM Standards to pedagogy standards for language minority students;
Nature of word problems and reading in a second language
  practice. Retrieved May 3, 2005 from
• Celedón-Pattichis, S. (2003). Constructing meaning: Think-aloud
  protocols of ELLs on English and Spanish word problems. *Educators for

Session 10  June 17
Gender and Mathematics
  measurement as a means for girls to analyze their sense of body image. In
  W. G. Secada (Ed.), *Changing the faces of mathematics: Perspectives on
  multiculturalism and gender equity* (pp. 67-73). Reston, VA: National
  Council of Teachers of Mathematics.
• Trentacosta & Kenney, Ch. 20, 23
• Video: Failing in Fairness (Part I and II)

2nd Reading Journal Due

******************************************************************************
FINAL PROJECTS DUE JUNE 24******************************************************************************