

D R A F T  
CEMELA School-II: Language and Mathematics

Goals of CEMELA School-II

The following goals for the second of CEMELA schools are based on those presented in the original proposal submitted to NSF, and on results from a needs assessment sent to all Fellows and to selected PIs (Kip Tellez; it was not sent to Judit who was on sabbatical) and advisory board members (Carmen Mercado and Antonia Darder) who have specific expertise in Bilingual/ESL education.

Goals:

- To develop and enhance pre and post-doctoral Fellows' understanding of the ideas and issues that form the theoretical foundation of what it means to learn in two languages (cognitively, socially, politically, etc.);
- To develop and enhance pre and post-doctoral Fellows' understanding and skills in being able to analyze various language contexts and factors (e.g., bilingualism, second language acquisition, discourse processes/socialization, and language ideologies that affect Latinos learning mathematics;
- To develop and enhance pre and post-doctoral Fellows' abilities and skills in articulating an integrated conceptualization of Latinos' mathematics learning in light of discourse constructs, bilingualism, second language acquisition, and the sociopolitical factors surrounding such factors, such that they are able to develop relevant and appropriate research questions and methods, develop approaches to mathematics teacher education that integrate language and mathematics, and present cogent explanations and arguments regarding the integration of language and mathematics to students, teachers, and policy makers;
- To create a learning environment consistent with CEMELA's theoretical model and goals for pre and post-doctoral Fellows that maximizes dialogue, active analysis of concrete examples of the target phenomena, and integrated or holistic learning.

Objectives:

Through assigned readings given before the school, interactive large and small group discussions, video and transcript analysis, and specially designed questions for participants to collectively address, Fellows will

- Develop an enhanced understanding of the sociocultural/sociopolitical issues, nature, and role of learning mathematics in two languages, including processes of language socialization and ideology in mathematics teaching and learning.
- Develop an enhanced understanding of the nature and role of language and discourse in improving Latinos' well being and academic performance especially in mathematics.
- Develop skills and abilities to analyze concrete examples of learning mathematics in a bilingual, ESL, and/or mainstream context, and apply foundational concepts of bilingualism, second language acquisition, language socialization, and language ideology to discourse analysis.
- Demonstrate abilities and knowledge to integrate language and mathematics in the development of teachers (preservice and inservice), in mathematics teaching, in working with parents, and in policy matters.

- Demonstrate abilities and understandings to develop research agendas or questions for investigating the relation between language and mathematics.

Guidelines for the school:

1. Participants will engage in concrete explorations and applications of theories and constructs. This will be accomplished in at least two ways: video/transcript analysis of classrooms and/or student interactions, and cooperative joint development of answers to “problem-solving” questions (around the intersection of language and mathematics) which will be shared with the whole group.
2. Activities of the school will reflect an integration of concepts, application, and dialogue. The format will differ from the previous school and from traditional approaches to “schools” in general in that key target topics will be presented, encountered, and discussed in multiple venues. Topics will be integrated into “tasks” to be done by Fellows and in various interactive structures. Participants will meet in whole group for special presentations (i.e., panels, etc.), in frequent small discussion/problem solving groups, and in groups for sharing key ideas generated in other venues. However, all activities are designed to meet the goals and questions as put forth in the CEMELA grant, i.e., there will be evidence to support that we did what we proposed to do.
3. Participants will be given an assignment to bring video/audio data and transcripts of an event involving teachers, students, and/or parents that concerns talking mathematically and that reflects a Fellow’s “burning question” about the role and nature of Spanish/English and discourse processes in mathematics education. These data will form much of the basis of Fellows’ discussions and investigations. See attached assignment.
4. A set of vignette type questions will be created and groups will develop answers to these questions; the answers will be shared among groups and will receive reactions from faculty and other Fellows. The questions, for example--in general—will ask participants a) to create and defend a mathematics/mathematics education course that integrates language concepts and issues, b) design a study investigating language and mathematics, c) develop an outline for a policy paper brief(s) that explains to parents, schools, and/or communities the role of language(s) in students’ learning mathematics, or d) create an annotated bibliography of key articles related to languages and discourse processes in mathematics.
5. Participants will be assigned to groups so that there is equal representation of the four sites in each group. Groups for this part of the school will not work according to interest (i.e., after school, parents, or teachers). All participants will address arenas of teachers, students, parents, and policy just as faculty do in their positions. Time will be provided for the research working groups to meet aside from groups “doing language”, and also for impromptu meetings around individual interests.
6. Readings will be identified and distributed in early Spring and discussions and “assignments” will be based on these readings.

## Course contents

There basically will be two courses (described below). Each one will be taught through two simultaneous sections. The purpose for having simultaneous sections is to keep the groups relatively small in order to maximize interactions. Having all the fellows and other participants meet together will create a “large lecture” environment that is less conducive to interactions.

Course or strand I will consider the following: As researchers, teacher educators for mathematics, and as implicit contributors to educational policy related to Latinos in mathematics, what should we know and be able to do regarding Spanish and English?

- A. What is the role of Spanish in learning (e.g., mathematics)? What key concepts should be considered to answer this?
- B. Should a student be encouraged or allowed to learn mathematics in a native language other than English? If no, why, and what are the teaching, learning, and sociopolitical implications of this? If yes, why, and what are the teaching, learning, and sociopolitical implications of this?
- C. What key concepts guide understanding of second language acquisition? If second language acquisition primarily is an appropriation process, what does this mean for how mathematics classrooms are organized and how academic language is developed? What factors might impact this process?
- D. How do these concepts and issues play out in classrooms? How do they influence the meaning-making process and development of academic language in mathematics? As we look at excerpts of classroom activities, can we see examples of the aforementioned concepts and practices, and what questions arise in light of what we see?

Course or strand II will consider the following topics. As researchers, teacher educators for mathematics, and as implicit contributors to educational policy related to Latinos in mathematics, what should we know and be able to do regarding language as social practice in mathematics teaching and learning? What do we know in this area(s) and what do we still need to know

- A. What does it mean to speak mathematically? What is the mathematics register and how does this relate to mathematics teaching and learning, if at all?
- B. Discourse refers to more than just words spoken; it concerns ways of knowing and valuing in a particular community of practice. This is a key concept from the work of Gee. How does this idea inform teaching and learning mathematics?
- C. What are the linguistic demands in the mathematics context, i.e., the academic language demands in curriculum materials, tests, assessment, and how do these demands impact or pertain to Latinos/as?
- D. How can a framework such as language ideology inform us about teaching and learning mathematics with Latinos?

## Draft of Data Analysis Assignment for Fellows

For CEMELA School-II that focuses on language and mathematics, we would like you to bring data to be shared with the other school participants and to have a “burning” question about something you see in these data, a question that relates to language and mathematics. Analysis of data will be different to what you may be used to; it will follow a rigorous protocol that teachers use in inquiry activities which we will share with CEMELA School participants. Your role will be to present the data and your question. A facilitator assigned to your group will guide the group in a process of examining your data in light of your question. During this process, you will take notes on what group participants say.

Task: Select a short video segment (5-7minutes on CD) of Latino students doing mathematics. The event on the video can be at any grade level; it can be from a classroom episode, some out of school event, an interview of a student(s), parents doing mathematics with their child, or any other situation. However, the segment of video data should reflect some aspect of, idea, or issue relating to Spanish or English, or both in the learning and teaching of mathematics. It should reflect something you are curious about. A transcript of the video will be necessary and copies should be brought for 10-12 people.

Or

Select some student work that reflects some aspect of, idea, or issue relating to Spanish or English, or both in the learning and teaching of mathematics from the same contexts as described above. The student work should include either several examples of one student’s mathematical work or several students’ work around the same mathematics. The point here is that there should be more than one piece of student work to examine.

Come prepared to discuss the data (video segment or student work) by having a question about language and mathematics that you want co-participants to consider. The question in this case is not a dissertation type question, but rather about something you observed in the data regarding language and mathematics that you are curious about. Also be able to ground any discussion of the data that may follow in the readings for the school or other literature you have identified.

