

## **Where was the mathematics at the CEMELA School?**

Judit Moschkovich (UCSC)

Ksenija Simic (UA)

Johnnie Wilson (UCSC)

An interesting question arose during the CEMELA School. Several participants, as we designed the short courses and as we participated in the School, wondered “Where is the mathematics in what we are doing?” CEMELA researchers who have examined everyday, school, and academic mathematics as cultural practices (Civil & Andrade, 2002; Moschkovich, 2002) proposed that Fellows consider this question for several reasons: as a way to facilitate communication across disciplines, as way to uncover mathematical ideas that may not have been immediately evident in our activity, and to stimulate discussions of how we “see” mathematics differently depending on our theoretical perspective and mathematics background.

Asking the question “Where was the mathematics?” requires that we examine what “mathematics” means to us, consider what sorts of activities we think are (and are not) “mathematics,” and describe in detail where and how, exactly, we saw “mathematics” in action during the CEMELA School. Fellows reported that, after considering this question, they concluded that “mathematics” was not a separate activity but, rather, they experienced “mathematics” as integrated into many aspects of the work during the CEMELA School. Below are some of the responses that Fellows shared in response to the question “Where was the mathematics at CEMELA School?”

### **Responses from Fellows**

The consensus among the fellows was that they seem to be well acquainted with the typical mathematical procedures learned in school. (As reported in the research literature on everyday mathematics, those are the types of mathematical practices that are most easy to identify as “mathematics.”) Fellows also agreed that the main purpose of the CEMELA School was not to teach or learn mathematics, but to support Fellows in developing skills to conduct research

on teaching and learning mathematics with Latino learners and to examine how mathematics teaching can support Latino/a students in learning mathematics. We also found it was especially important to consider how mathematics teaching can build on the experiences of different student populations, especially since CEMELA researchers and Fellows come from four geographical areas, where Latino populations, as well as policies regarding Latinos, differ greatly.

Fellows reported they encountered several mathematical concepts and processes during the short courses: percentages, proportionality, area, place value and the structure of our naming system for numbers, and graphical representations (during Social Justice); graphing, proportional reasoning, scale, and slope (during Methodology); numeracy, percents, estimation, calculating discounts, patterns, attributes, and mental calculation (during Socio-cultural Theories). Fellows also reported that they saw applications of classical, community and critical knowledge (Gutstein, 2005) in the Social Justice course, that mathematical communication was central to activities in the Methodology course, and that they saw a real-life example of the use of funds of knowledge in the Socio-cultural Theories course. Many Fellows reported that there were many short course activities that effectively engaged them in mathematical thinking, for example:

When describing Erin Turner's presentation on the curriculum used at the New York school at which she taught, a Fellow explained: "This was a great example of how to apply the theory learned in the Social Justice short course. She described how she worked with the teacher to develop mathematics curriculum and then apply it to engage the students in issues relevant to their lives."

When describing the case of a family buying a prom dress on a budget, and the funds of knowledge used in this activity, a Fellow said "I found this example of family mathematics very interesting. It showed the richness of family knowledge in applied mathematics and how math can be used as a tool to negotiate everyday challenges."

As CEMELA Fellows develop expertise in mathematics education, they are also developing our understanding of what "mathematics" is and how

different theoretical traditions such as ethno-mathematics, socio-cultural theories, and critical pedagogy view mathematical practices. They are also learning how to recognize, document, and analyze mathematical thinking when they see people engaging in both everyday and school practices. The first CEMELA School provided Fellows with opportunities to engage in classical and school mathematics, develop an understanding of community mathematical practices, and consider how to include critical mathematical knowledge during instruction. Short courses and discussions during the CEMELA School have also raised many questions for Fellows that will continue to be discussed between now and the next CEMELA School. Fellows' experiences of the mathematics during the CEMELA echoes the conclusion reached by researchers about mathematical practices in everyday life: mathematical activity was evident in many aspects of the CEMELA School, when it wasn't immediately obvious, what we needed to do was examine our activity with the goal of finding the mathematical ideas.

Civil, M. & Andrade, R. (2002). Transitions between home and school mathematics: Rays of hope amidst the passing clouds. In G. de Abreu, A.J. Bishop, N.C. Presmeg (Eds.), *Transitions between contexts of mathematical practices* (pp. 149-169). Dordrecht: Kluwer.

Gutstein, R. (2005). *Reading And Writing The World With Mathematics: Toward a Pedagogy for Social Justice*. New York: Routledge.

Moschkovich, J. (2002). An Introduction to examining everyday and academic mathematical practices. In M. Brenner & J. Moschkovich (Eds.), *Everyday and academic mathematics: Implications for the classroom*. *Journal for Research in Mathematics Education*, Monograph Number 11, 1-11.