The Organization of a Peer Mathematics Discussion among Middle School Students

Bill Zahner
Judit Moschkovich
University of California, Santa Cruz

Abstract
This study analyzes patterns of interaction among bilingual middle school students during mathematical discussions. Using ethnomethodology, conversation analysis, and discourse analysis I show that the students primarily engaged in “calculational” conversations, that regularities in the students’ peer mathematics discussions differed from the regularities of everyday conversations, and “intellectual authority” emerged as an important construct for understanding students’ mathematical peer discussions.

Theoretical Framework
- Situated & sociocultural perspective on mathematics learning & discourse (Moschkovich)
- Discourse analysis & studies of reform in mathematics teaching/learning (Lampert; Stad & Kieran; Forman; Yackel & Cobb; & Wood; Thompson et al.; Gee)
- Conversation analysis & norms (Heritage; Sacks Schegloff & Jefferson; Forman; Yackel, Cobb, & Wood; Moschkovich)

Methods
Setting
Sixth grade classroom in Bilingual K-8 School
Harcourt California math text
Class connect to CEMELA’s TRG and SLRG

Data
4 Hours of video recorded group conversations
(Did not change curriculum or setting)
Focus Group Interview
Student Survey
Teacher Interview
Analysis
Analysis of students’ written work
Mathematics discourse analysis
Conversation analysis

Calculational Orientation
Prompt: If six pairs of socks cost $4.50, how much will 9 pairs cost?
1. Lorenzo A: ((Amber walks around the table and stands to the right of Lorenzo A, who is writing on a shared paper)) How would I do?
2. Amber: Ah a um let me see
3. LA: Number four
4. A: Number four (for the) (1) then you put (2) nine up x equals nine (£3);
5. LA: ((The question is repeated))
6. A: Now put a number a letter (1) alright, and then, let’s see: six
7. Francisco: you guys have problem up there ((points to blackboard))
8. LA: Six divided by (four-fifty)?
9. Francisco: ((Oh my God, but (kinda) she’s helped me)

Students’ Impressions of Each Other’s Math Skills

<table>
<thead>
<tr>
<th>Students' Impressions</th>
<th>Monday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Total</th>
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<tbody>
<tr>
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<td>16</td>
<td>14</td>
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<tr>
<td>Claudia</td>
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Finding: Students’ impressions of each other’s math skills correlated with the number of questions they asked in the discussion. Students who were more confident in their math skills were more likely to ask questions and contribute to the discussion.

Distribution of Math Questions

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The (Re)Construction of Intellectual Authority

The issue of intellectual authority is central to this comparison between how mathematics is known in school and how it is known in the discipline. In the classroom, the teacher and the textbook are the authorities and mathematics is not a subject to be created or explored. In school, the truth is given in the teacher’s applications and the answer book” (Lampert, 1990 p. 32)

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