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George F. Sweeney* (georgefsweeney@gmail.com). *Creating, Using and Interpreting Vectors and Vector Equation in a Classroom Community of Practice.*

One of the challenges of teaching linear algebra is fostering students' fluency with the symbolic and conceptual system of vectors and vector equations. Symbolizing vectors and vector equations is crucial as an entry point into the more theoretical and abstract world of linear algebra. In this study, six class episodes of a classroom teaching experiment (Cobb, 2000) were analyzed utilizing a modified Toulmin scheme (Rasmussen & Stephan, 2007) for the activities and practices involved with learning this conceptual system. I then triangulated this analysis with data from a series of focus group interviews and student work. This joint analysis focused on the creation, use and interpretation of vectors and vector equations as negotiated by members of the classroom. My presentation will provide an empirical analysis of what members of this classroom did and said in order to give insight into the questions: What do students think vectors and vector equations are? What does it mean for a set of vectors to span or be linearly dependent? What is a basis and why is it important? Answering these questions can aid instructional designers and teachers in expanding students' symbolic fluency and understanding of formalized linear algebra. (Received September 22, 2010)