Translating Definitions Between Registers as a Classroom Mathematical Practice
Contributed research report

Abstract: Many have noted that mathematical definitions constitute a duality between a category of objects and the definition that delineates that category (Alcock & Simpson, 2002; Edwards & Ward, 2008; Mariotti & Fischbein, 1997; Tall & Vinner, 1981). Prior research has readily identified conflict between these two elements of students' conceptions, but reliable mechanisms for explaining and resolving such conflicts are still forthcoming. The present study observed a real analysis classroom in which the duality was embodied and addressed directly in class dialogue and activities. Particularly, three linguistic registers (metaphorical, common, and symbolic) arose to express different aspects of the definitions themselves (conceptual and formal). Translation across these registers provided a mechanism by which some students were able to segue their concept image and concept definitions successfully. Some students corrected errors in their concept image as a result of this practice.

Keywords: mathematical defining, real analysis, translating definitions, harmonisation, classroom communication