TEACHING FOR ROBUST UNDERSTANDING IN MATHEMATICS

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Our study focuses on developing a classroom observation scheme for capturing and analyzing teaching practices hypothesized to foster students' development of robust understanding of algebra. We aim to provide a tool to address questions such as: "What are the critical aspects of Algebra classrooms?" by capturing critical aspects of classroom interaction through real-time classroom observations. Our coding scheme, Dimensions of Teaching for Robust Understanding in Mathematics (TRU MATH), builds on the work of existing classroom observation tools, such as IQA (Junker et al., 2005), but includes an algebra-specific focus. In this poster, we will share the rationale for TRU MATH, and report on the results of the use of this scheme in twelve Algebra 1 classrooms.

TRU MATH focuses on 6 dimensions of classroom practice: (1) Important Mathematics; (2) Cognitive Demand; (3) Access; (4) Agency, Authority, and Accountability; (5) Uses of Assessment; and (6) Algebra Content-Specifics addressing the following "essential" questions about mathematics classrooms: (1) Did the lesson engage the students and teacher in working on mathematics consistent with the Common Core Standards? (Common Core State Standard Initiative, 2010); (2) Did students engage in "productive struggle" with the mathematics? (Henningsen & Stein, 1997); (3) Did all students have the opportunity to engage with the learning? (Cohen & Lotan, 1997); (4) Who had a voice in the classroom discussion and ownership over the mathematical ideas? (Engle & Conent, 2002); (5) Did instruction seek to reveal what students know and build on it? (Black, Harrison, Lee, Marshall, & Wiliam, 2003); (6) Did students engage in practices that support solving algebra word problems? These dimensions are scored on rubrics specific to particular facets of classroom interaction, such as: the launch of a task, whole class discussion of mathematical ideas, or the connecting of ideas to prior knowledge. Using these scores, we can create profiles of Algebra teaching across these dimensions which can be correlated with student performance on contextual algebraic tasks (described in another proposal) to provide insight that supports and improves the teaching of Algebra.

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