

A Tale of Two Sets of Norms: Comparing Opportunities for Student Agency in Mathematics Lessons with and without Interactive Simulations

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We investigated the social and sociomathematical norms within a middle school math classroom, comparing lessons involving computer simulations (sims) versus non-sim lessons. We found statistically significant differences in indicators of social norms between the two types of lessons. In sim lessons, the teacher (Madeline) more frequently took the role of a facilitator of mathematical ideas, and students exhibited conceptual agency more often. On the other hand, there was substantial overlap: Madeline usually acted as an evaluator, and the students usually exhibited disciplinary agency in both types of lessons. However, there was a stark contrast in sociomathematical norms between the two types of lessons. Students' specifically mathematical obligations in non-sim lessons consistently included practicing procedures in isolation, whereas obligations in sim lessons involved developing and sharing strategies, making conjectures and providing justifications. We see these differences as a sign of Madeline's ability to facilitate student-centered mathematics lessons when she incorporated sims.