Developing Multi-modal Assessments of Student Learning in Technology-Infused Environments for High School Chemistry

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Abstract:
This presentation examines how science students communicate what they know across modalities simultaneously. An analysis of student drawings, symbols, and verbal responses on multi-modal assessments from The Connected Chemistry Curriculum demonstrates how students represent their sense of chemical mechanisms using multiple modalities. Correctness of responses and the representations of mechanistic features (i.e., composition, position, motion, and interaction) were seen to vary as a function of modality. When assessed via a single modality, students appear to lack a mechanistic understanding; however, assessing students using multiple modalities simultaneously reveals that students can in fact demonstrate an understanding of mechanism in ways that are unobserved in a single modality. Results from this study address limitations of what we can know when we use single modality assessments and suggest that by doing so, we are likely underestimating as well as overestimating what students learn.