USING ANIMATIONS TO CONNECT MACROSCOPIC, SUB-MICROSCOPIC, AND SYMBOLIC REPRESENTATIONS OF THE WORLD

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PROBLEM
Chemistry is considered a difficult subject mainly due to multiplicity of representations, i.e. the Johnstone's triangle of macroscopic, sub-microscopic, and symbolic domains (Johnstone, 1982). When students learn chemistry, moving between these domains is a well-recognised challenge (Cardellini, 2012).

PLAN
Teaching resources must address all three domains. For example, sub-microscopic level can be represented by cartoons, macroscopic level by video recordings of laboratory experiments, and symbolic by chemical reactions and mathematical calculations.

ACTION
To address this challenge, we developed a series of animations to illustrate the chemical phenomena most difficult for students. They were accompanied with the audio and text narration designed to get students to address their assumptions and misconceptions and to assist hearing-impaired and non-English speakers. The animations were evaluated using engagement analytics, test results, and student/academic comments.

REFLECTION
To develop these animations, we combined evidence-based pedagogy and technology, to improve student learning and enrich student experience. Animations address shifting expectations of our students by providing them with learner-centred approaches to enhance learning engagement and impact. Teaching and learning with animations is flexible and self-paced.

REFERENCES
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