COMBINING MULTIMODAL REPRESENTATIONS TO SCAFFOLD STUDENT UNDERSTANDING OF DISPERSION FORCES

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BACKGROUND

As part of instructional design for hybrid learning environments, teachers have opportunity to combine multiple modes of representations aiming to support their students' learning. The discipline of chemistry relies on representations to visualise molecular level phenomena that cannot be seen by the eye and these involve sub-micro representations of atoms and bonds. The interaction between molecules in the form of London dispersion forces are particularly challenging to portray as these involve the dynamic properties of electrons around atom nuclei. Representations typically involve the 'electron cloud' model which is fairly abstract and enables students to consider the unequal distribution of electrons that result in dipole-dipole and hydrogen-bonding interactions.

METHOD AND OUTCOMES

Individual students' visual and connectional understanding of combinations of representations have been explored using the 3P-SIT interview methodology (Schönborn & Anderson, 2009). Representations include 2D graphics, dynamic simulations and 3D tactile models. The range of student perceptions captured have been used to inform an instructional intervention, an online module. Evaluation of student engagement with the module will be presented.

REFERENCE

Schönborn, K. J. & T. R. Anderson (2009). A Model of Factors Determining Students' Ability to Interpret External Representations in Biochemistry. *International Journal of Science Education 31*(2), 193-232.