

UNDERSTANDING AND SCAFFOLDING STUDENT KNOWLEDGE OF DISPERSION FORCES THROUGH MULTIPLE REPRESENTATIONS

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KEYWORDS: student conceptions, multiple representations, dispersion forces

The role of multiple representations in exploring and addressing student conceptions related to dispersion force theory, which is an integral concept in undergraduate chemistry education, have been investigated. Stimulus-response think-aloud interviews were completed with nine first-year (FY) and two second-year university students to assess their range of thinking around this topic. Specifically, interviewees were asked to provide descriptions of dispersion forces, their mental models of the atom, and explain the basis of interactions between two butane molecules. In parallel, students were shown various representations and asked to provide their understanding of what they depicted. Also, an animation, created by the researcher, was piloted with FY students. It was further improved based on student feedback and shown to the second-year students to further consider its effectiveness as a learning tool.

Findings from qualitative data analysis include that most of the FY students who had sound understandings of dispersion forces, did not have a mental model of the atom that correlated theoretically. Also, most of the FY students failed to give complete descriptions of how dispersion forces arise. As a result of the study, the tool and several recommendations were made available to instructors to improve teaching of dispersion forces.

Proceedings of the Australian Conference on Science and Mathematics Education, 29 September - 1 October 2021, page 8, ISSN 2653-0481