

EXPLORING THE RELATIONSHIP BETWEEN MENTAL IMAGISTIC ABILITY AND STUDENTS' REPRESENTATIONAL COMPETENCE AND FLUENCY IN CHEMISTRY

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Aphantasia was defined in 2015 as the condition of reduced or absent voluntary mental imagery and has been identified as affecting 2-5% of the population. The importance of visualisation skills in learning chemistry has been well emphasised in literature, however aphantasia has been found to be overrepresented in STEM domains. Furthermore, spatial ability has been found to be intact in aphantasics (Zeman et al., 2010), and may actually be superior compared to the remaining population (Pounder et al., 2018). It is important for novice chemists to be able to examine and make meaning of multiple representations during the construction of mental models of core chemistry concepts, however what if a student is unable to rely on a visual mental element in doing so?

As part of a research higher degree project, a 3-phase study is in progress to explore this area. In Study 1, a series of eight online interactive tasks have been designed to assess first-year student performance in problems relating to visualisation and chemistry. Furthermore, a semi-structured interview protocol was designed to gain student insights, one such type being the alternate strategies employed by those without mental visualisation ability. The findings from the pilot phase will be presented to demonstrate the effectiveness of the diagnostic tool which underpins the later phases of the project. Insights into students' perceptions of mental imagery and their learning, and the strategies that they adopt will be shared. Further questions that have arisen from preliminary data findings will also be discussed, such as questions relating to student perceptual fluency in transferring between multiple representations.

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