ANALYTICAL MODEL FOR STUDENTS' LEARNING WITH MULTIPLE REPRESENTATIONS

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ABSTRACT

When teaching and explaining science concepts, we use multiple forms of representations, such as diagrams, graphs, formulas, and texts. While we as science instructors can coordinate multiple representations flexibly and fluidly, science students often have difficulty utilizing scientific diagrams or graphs for their learning. Some students tend to focus on the surface features of those representations without comprehending the main ideas, while others critically evaluate representations to solve problems and extend their understanding of the concepts. Such differences in students' use of multiple representations greatly influence the level of understanding of the concepts, and it is important to be able to analyse different learning strategies with multiple representations. In this presentation, we introduce a model for science educators to use when analysing students' learning with representations (Won, Yoon, & Treagust, 2014). This model is adapted from Ainsworth's (2006) DeFT framework, which includes access to complementary information, use of one representation to interpret the others, and evaluation, abstraction, and extension of representations. We showcase how this analytical model can be used to better understand students' different learning strategies and describe two cases: biology students and physics students.

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