

**SP - (15911) - TEACHING MOLECULAR ORBITAL THEORY USING A CSCL APPROACH IN AN ENTRY-LEVEL UNIVERSITY COURSE**

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**Short Abstract**

Recent studies document that many chemistry students drop out of university (Heublein, 2014; Søgaaard Larsen, 2013). The authors of these studies identify the requirement of a high level of content knowledge and, as a result, a declining interest in the subjects taught as primary reasons. Central barriers in the first semester are the chemical basics, as students enter university with different prior knowledge (Averbeck et al., 2017; Tai et al., 2005), and quantum chemistry models of the atom and of atom bonding such as molecular orbital (MO) theory (Bouayad et al., 2014; Partanen, 2018; Taber, 2002a, 2002b).

In this project we develop and evaluate a two-part intervention about MO theory that complements the regular lecture: First, the students independently work on an interactive digital learning environment (DLE). Afterwards, they work together in small groups and collaboratively create Concept-Maps (Novak & Cañas, 2006). We evaluate this intervention through a self-developed knowledge test, as well as tests of attractiveness, students' cognitive load, the usability of the DLE and the concept-mapping process. The collaborative group processes are analysed through audio and screen recordings.