

USING MODERN TECHNOLOGIES TO IMPROVE THE ACCESSIBILITY OF THE FIRST-YEAR CHEMISTRY LABORATORY

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First year chemistry units are a mandatory requirement for students wishing to complete degrees in the hard and soft sciences. Chemistry education relies on laboratory-based learning to reinforce the core scientific principles that underpin the course content (Holstein & Lunetta, 2004). Since laboratory programs are highly visual in nature, students with a visual impairment are unable to independently engage in the programs, reducing the likelihood of them pursuing careers in science, technology, engineering, and maths (STEM) fields. Technologies such as the Sci-Voice Talking LabQuest, have empowered blind and low vision (BLV) students to engage independently in chemistry experiments, unlocking opportunities to pursue rewarding and stimulating careers in STEM, similar to their sighted peers (Supalo et al., 2023; Supalo et al., 2016).

In this work, we present the enhancements to the first-year chemistry laboratory curriculum at the University of Sydney, that improve its accessibility to BLV students. Experiments have been developed and tested that span one whole semester, and more are in the testing phase. 3D printed tools were developed to enhance the utility of existing technologies and improve the safety of the laboratory environment – minimising risks and handling errors that are typical in wet laboratories. By engineering solutions into the learning environment, as opposed to outright exclusion of important experimental steps, we maintained the equality of the learning experience, whilst enhancing student independence.

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