

# INCLUSION OF STUDENTS WHO ARE BLIND OR LOW VISION IN CHEMISTRY

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In the School of Chemistry of The University of Sydney we aim to build an inclusive culture for all our staff and students. We have embraced changes in the undergraduate curriculum that offer diverse pathways for science students. In first-year chemistry, approximately half of all contact hours are spent in the chemistry laboratory. Laboratory work is particularly challenging for students who are blind or low vision. Historically, these students have worked with laboratory assistants that performed the experiments and informed them of the results and observations. While this allows students to adequately meet the requirements of the degree, it is not a satisfactory arrangement for them and restricts their learning potential in the laboratory. While the number of students with disabilities enrolling into science, technology, engineering and mathematics (STEM) continues to increase, they are still underrepresented as a result of technological and attitudinal barriers.

This project aims to empower blind and low vision students to be in command of their own learning, with wide-ranging beneficial effects of improving their self-efficacy, self-confidence, and laboratory skills, and building a highly inclusive learning culture. According to the World Blind Union, there are more than 285,000,000 blind and visionally impaired persons around the world today.

In this presentation we will discuss advanced technological developments (Supalo et al., 2016) that will help blind or low vision students to work independently in the Chemistry laboratory (Devi et al., 2023), including the use of commercially available talking scientific data loggers and braille embosser technologies to assist with data collection and analysis tasks. We aim to create a blueprint for other Schools in our own institution and beyond, and lead strategies in inclusive higher education for Australia. We have already mapped out a complete set of experiments that can be adapted, so that students who are blind or have low vision can carry them out independently. This presentation will discuss those experiments and our strategies towards implementing the whole laboratory program.

## REFERENCES

Devi, P., Motion, A., Bhattacharya, J., Supalo, A. C., & Schmid, S. (2023) *Unpublished results*, The University of Sydney.  
Supalo, C. A., Humphrey, J. R., Mallouk, T. E., Wohlers, H. D., & Carlsen, W. S. (2016). Examining the use of adaptive technologies to increase the hands-on participation of students with blindness or low vision in secondary-school chemistry and physics. *Chemistry Education Research and Practice*, 17(4), 1174-1189.

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