

# VIRTUAL PHYSIOLOGY LABORATORIES DURING A PANDEMIC: ARE THEY EFFECTIVE FOR STUDENT LEARNING COMPARED TO IN-PERSON LABORATORIES?

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**KEYWORDS:** virtual laboratories, laboratory skills, COVID-19, biomedical science, physiology laboratories

## BACKGROUND

COVID-19 has significantly impacted higher education, including rapidly transitioning interactive, in-person laboratories to virtual settings. Human physiology laboratories, emphasised in hands-on, active learning, have been particularly impacted by these changes.

## THE INITIATIVE

We assessed whether virtual laboratories are effective in achieving similar student learning outcomes as in-person laboratories, namely in students' conceptual understanding, research and technical skills development.

## METHODS

Students were randomly assigned to either an in-person or virtual laboratory. The in-person laboratory provided students with hands-on experience in data collection and analysis, while the virtual laboratory included a self-directed module, guiding students through the same series of experiments using pre-recorded videos and data. Pre- and post- surveys were used to assess differences in students' conceptual understanding, and self-reported ratings of confidence in research and technical skills.

## OUTCOMES

Both groups demonstrated significantly improved performance on conceptual- and research-based multiple-choice questions. The in-person group performed significantly better on application-based, short-answer questions, and rated significantly greater confidence in their technical skills. No significant differences were observed on self-reported ratings of student confidence in research and technical skills. Our findings highlight the importance in identifying pedagogical approaches which focus on developing students' ability and confidence in technical and research skills within virtual settings.

Proceedings of the Australian Conference on Science and Mathematics Education, The University of Western Australia, 28-30 September 2022, page 53, ISSN 2653-0481