

# RESEARCH DIRECTIONS

## Crossing thresholds in school biology

**Associate Professors Pauline Ross and Roy Tasker from the School of Natural Sciences, Dr Betty Gill, College of Health and Science, Dr Charlotte Taylor from University of Sydney and Lachlan Macquarie College, together with NSW Department of Education & Training have been awarded a UWS Research Partnership grant to investigate threshold concepts in biology in order to develop teaching approaches that are appropriate for diverse learners.**

'To ensure Australia's future prosperity, we need well trained and innovative scientists who actively engage in world-leading research' says Associate Professor Ross. 'At present, we have few paradigms which support teachers to deal with the well known conceptual challenges of science and biology. We will use threshold concepts to describe key ideas in biology that lead students to a transformed view and better understanding of Stage 4 of the NSW Science Years 7-10 syllabus. Interventions will be designed to overcome barriers in learning biology and improve student conceptual development and performance in state wide tests including the Essential Secondary Science Assessment.'

Teachers will be surveyed to quantify and identify what aspects of biology they find difficult to teach and students find difficult to learn, why these content/concepts are difficult to teach and what strategies they use to successfully overcome these difficulties. Following the survey, teachers from five schools will be recruited to engage in two professional learning workshops on "threshold concepts" and interventions. Teachers and students will then be supported to design and implement the interventions. The effectiveness of the interventions will be evaluated using pre and post testing, Essential Secondary Science Assessment data and interviews.



The research outcomes have the potential to generate a new way of teaching and learning the difficult concepts and processes of science in secondary schools in NSW, which may break a self reinforcing cycle of misconceptions and disengagement in secondary science classrooms.

**Project Title:** Crossing thresholds in secondary school biology

**Funding has been set at:** \$11,390

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