

INVESTIGATING FACTORS THAT SUPPORT AND CHALLENGE IN IMPLEMENTING AUTHENTIC RESEARCH EXPERIENCES FOR UNDERGRADUATES

Matthew Green^a, Gwen Lawrie^a, Paula Myatt^b, Rhianna Pedwell^a, Jack Wang^a, Peter Worthy^a, Kirsten Zimbardi^c, Susan Rowland^a

Presenting Author: Matthew Green (matthew.green3@uqconnect.edu.au)

^aSchool of Chemistry and Molecular Biosciences, The University of Queensland, St Lucia QLD 4072, Australia

^bTeaching and Educational Development Institute, The University of Queensland, St Lucia QLD 4072, Australia

^cSchool of Biomedical Sciences, The University of Queensland, St Lucia QLD 4072, Australia

KEYWORDS: undergraduate, research experience, course integrated, implementation, case study, science

This study investigated the implementer experience of introducing an Authentic Large Scale Undergraduate Research Experience (ALURE) into 7 science courses in three Australian tertiary institutions. The results will be of value to tertiary science educators interested in giving the opportunity to experience the benefits of research participation to a larger number of their undergraduate students.

BACKGROUND

The integration of research experiences into undergraduate curricula is of special importance in the fields of STEM. Engaging undergraduate students in research is considered essential for a tertiary science education, informing students future career course and increasing student retention. Our project is supporting the introduction of an ALURE (Authentic Large Scale Undergraduate Research Experience) practical into several undergraduate science courses. These ALURE practicals are designed to overcome the cohort size limits of the research internship model primarily due to their integration to the course based practical session. ALUREs are designed to give whole cohorts of students a chance to take part in an undergraduate research experience throughout their education; giving students an idea of what real research is before they enter into post-graduate life. Our team has previously documented several ALURE practicals reported in several papers (Rowland, Lawrie, Behrendorff & Gillam 2012; Wang, Schembri, Ramakrishna, Sagulenko & Fuerst, 2012); this allows us to act as mentors to new ALURE implementers during our OLT-funded Leadership for Excellence Project.

AIMS

This study aimed to document the experience of implementers during the delivery of an ALURE and determine what factors supported and challenged them during this time. The aim of the ALURE Project is to provide leadership and mentoring to any academics wanting to engage their undergraduates in course integrated research experiences. We aim to utilise this data to amend and improve current guidelines of ALURE implementation to define a best practice for the future.

DESCRIPTION OF STUDY

This year, ALUREs were implemented at various tertiary institutions nationally in courses covering a broad range of scientific disciplines including biochemistry, nanotechnology and microbiology. The implementers of these programs are the topic of this study and their experiences provide deeper insight into the potential hurdles to integrating a large-scale course based URE. Implementers that were investigated included course coordinators, laboratory demonstrators and preparation staff. The study included 7 different science courses across 4 Australian tertiary institutions.

DESIGN AND METHODS

This narrative and grounded theory mixed methods study drew from qualitative sources of information in the form of recorded interviews with implementers. Transcripts were coded to find common themes in order to discover the factors that challenged and supported the introduction of ALURE into their course.

RESULTS

Preliminary data shows that the main challenging factor is the time taken to implement these practicals into the course for the first iteration and that the primary supporting factor is the support of a change champion in the organisation. Based on interviews we have also developed models of ALURE implementation, which show how each implementation was organised. These models demonstrate the generalisability of the ALURE model to various fields of study and institutions and will be of benefit to anyone who is contemplating ALURE implementation.

REFERENCES

Rowland, S. L., Lawrie, G. A., Behrendorff, J. B. Y. H., & Gillam, E. M. J. (2012). Is the undergraduate research experience (URE) always best?: The power of choice in a bifurcated practical stream for a large introductory biochemistry class. *Biochemistry and Molecular Biology Education*, 40(1), 46-62.

Wang, J., Schembri, M., Ramakrishna, M., Sagulenko, E., & Fuerst, J. (2012). Immersing undergraduate students in the research experience: A practical laboratory module on molecular cloning of microbial genes. *Biochemistry and Molecular Biology Education*, 40(1), 37-45.

Proceedings of the Australian Conference on Science and Mathematics Education, University of Sydney, Sept 29th to Sept 30th, 2014, pages 30-31, ISBN Number 978-0-9871834-3-9.