

QUANTITATIVE SKILLS IN SCIENCE: FINDINGS FROM 13 CASE STUDIES

Kelly E. Matthews^a, Peter Adams^a, Shaun Belward^b, Carmel Coady^c, Leanne Rylands^c, Vilma Simbag^a

Presenting Author: Kelly Matthews (k.matthews1@ug.edu.au)

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

^bSchool of Engineering and Physical Sciences, James Cook University, Townsville QLD 4811, Australia

^cSchool of Computing, Engineering and Mathematics, University of Western Sydney, Penrith NSW 2751, Australia

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ABSTRACT

The focus on mathematics and statistics in undergraduate science education is gaining attention as the scientific community calls for higher standards of quantitative skills (QS). An Australian Learning and Teaching Council (now the Office of Learning and Teaching) project explored QS as a graduate learning outcome in science from a whole of program perspective. Using a case study methodology, this paper draws on interview data (n=48) from 13 institutions (11 in Australia and 2 in the United States) exploring how QS are incorporated into the undergraduate science curricula. Framed within a model for large-scale educational change based on the extensive work of Michael Fullan, each case study explored the vision and planning for QS, the implementation of approaches to build science students' QS across the curriculum and evaluation of subsequent QS learning outcomes. The analysis highlights the tremendous variation in the curricular approaches to build QS across the 13 institutions. We offer four QS curricular models to describe how mathematical and statistical knowledge is developed and applied in science units across the undergraduate degree program.

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