

# BUILDING THE CAPACITY OF ACADEMICS TO ASSESS HIGHER ORDER SKILLS THROUGH IMPROVED ASSESSMENT DESIGN

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## ABSTRACT

Across the sciences, high-stakes assessment (such as end-of-semester exams) often consist largely, if not solely, of multiple choice questions (MCQs). MCQs have advantages in large-scale testing, including automated marking and high reliability (Haladyna 2004). But in biomedical education, MCQs usually test knowledge recall (the lowest “Remembering” category in the cognitive domain of Blooms taxonomy). Psychometric analysis of MCQs exams in biochemistry and physiology from four universities has shown that they contained a substantial number of questions that were too easy for the cohort and lacked questions testing higher-order skills such as problem-solving, and knowledge analysis and application<sup>1</sup>.

It is possible to design MCQs that test higher-order cognitive processes—the UMAT and GAMSAT medical entrance exams routinely include MCQs which test higher-order cognitive skills. But to write questions of this standard requires skill and effort.

## OBJECTIVES

To build academic capability to design and write MCQ exams that test students’ capacity to solve problems and apply their knowledge/competencies in new contexts.

To improve the validity of assessment by adopting a rational assessment design approach, including mapping of questions against subject learning objectives.

## WORKSHOP DESCRIPTION

A 90 minute workshop with 25 participants maximum. The intended audience is all academic staff who use MCQs to assess student learning. Participants are encouraged to bring along MCQs for review and improvement and/or a stimulus.

## BIOGRAPHIES OF WORKSHOP TEAM



**Dr Kathy Tangalakis** BSc (Hons), PhD. Victoria University (VU).

Kathy is Discipline Head of Medical Physiology and Course Leader of the Bachelor of Biomedicine at VU. She teaches in a range of biomedical and health undergraduate programs and plays a major role in the review of curriculum and assessment in these programs. Kathy has been awarded three Vice-Chancellor’s citations for her contributions to improving the learning experience and outcomes for commencing students from diverse backgrounds and has received a number of VU teaching & learning grants. Kathy is also co-leader of the CUBenet group ‘Assessing Student Learning’ and has led MCQ workshops at VU.



**Dr Philip MacKinnon**, BSc (Hons), PhD, Grad Cert. Mmgt. Australian Council of Educational Research (ACER)

At ACER Philip is responsible for the development of assessment in science and mathematics. He has consulted and led assessment development programs for higher education and participated in the development quality assessment instruments at higher education level including the GAMSAT and the UMAT medical entry examinations. Most recently Philip has been leading the development of online interactive testing for scholarships in mathematics and science. Philip also leads a core Masters subject in the School of Engineering at the University of Melbourne.



**Prof Janet Macaulay**, BSc (Hons), MSc, PhD, GCHE. Monash University. **Janet Macaulay** is Professor and Director of Biomedical Education, School of Biomedical Sciences, Monash University. She is an education focused academic and Fellow of the Monash Education Academy. Janet teaches in a range of programs and is involved in curriculum design and assessment. Janet chairs the Faculty of Medicine, Nursing and Health Sciences Curriculum Standing Committee and is a member of the Faculty Assessment Working Group. Janet chairs the Education Committee of the International Union of Biochemists and Molecular Biologists and is the member for education of the Australian Society for Biochemistry and Molecular Biology (ASBMB). Janet is also a leader of the Australian Collaborative Universities Biomedical educators network (CUBEnet) and co-leader of the CUBEnet Assessment Working Group. She received the Monash University; Faculty of Medicine Dean's Award for Excellence in Education (2008), the ASBMB Education Award (2010) and the Federation of Asian and Oceanian Biochemists and Molecular Biologists Education Award (2013) and has received a number of faculty teaching grants.

## REFERENCES

Haladyna, T. (2004) *Developing and validating multiple choice questions*. 3<sup>rd</sup> ed Mahwah: Lawrence Erlbaum Associates.

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Psychometric Analysis conducted by the Australian Council for Educational Research.

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