

BEYOND ROTE: ASSESSING MATHEMATICAL THINKING, NOT SOLELY RESULTS

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ABSTRACT

Arguably the greatest challenge in mathematics education is in fostering an understanding of what mathematicians would recognise as “mathematical thought.” Students are not encouraged to study mathematics simply to learn to answer specific questions correctly, rather to develop the transferable skills of abstraction, problem generalisation and scalability, which will be of value to a wide range of future problems.

However, like many things in life – not just academia – we do not measure what we would like to, rather we measure what is easily measured and hope that this is a suitable proxy. In the case of mathematics education, this usually involves assessing only a numerical result or, at best, a numerical result along with a “show all of your working” statement. The danger of this is that we can encourage students to rely on rote learning of procedures or even results. If done well, students can obtain many correct answers (and hence usually high marks) even when their understanding of why the techniques work or where else they may be applicable is poorly developed.

In this session, we will discuss some possible developments in curriculum and assessment design and how these can be tailored to minimise the potential for encouraging rote or shallow learning procedures. These will be considered in the context of many of the pressures associated with teaching a typical Australian undergraduate cohort, including both external influences (e.g. the diversity of school or tuition backgrounds students may have come from) as well as internal influences (e.g. the impacts of modern technology such as online assessment within university.)

This will be an informal session with open discussion with all participants throughout. Sharing of experience, opinions and practice from all institutions is actively encouraged.

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