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Development and evaluation of a partially-automated approach to the assessment of undergraduate mathematics.

Pope, Sue (ed.), Proceedings of the British Society for Research into Learning Mathematics (BSRLM). Proceedings of the British congress of mathematics education, BCME-8, University of Nottingham, UK, April 14–17, 2014. London: British Society for Research into Learning Mathematics (BSRLM). 295-302 (2014).

Summary: This research explored assessment and e-assessment in undergraduate mathematics and proposed a novel, partially-automated approach, in which assessment is set via computer but completed and marked offline. This potentially offers: reduced efficiency of marking but increased validity compared with examination, via deeper and more open-ended questions; increased reliability compared with coursework, by reduction of plagiarism through individualised questions; increased efficiency for setting questions compared with e-assessment, as there is no need to second-guess the limitations of user input and automated marking. Implementation was in a final year module intended to develop students' graduate skills, including group work and real-world problem-solving. Individual work alongside a group project aimed to assess individual contribution to learning outcomes. The deeper, open-ended nature of the task did not suit timed examination conditions or automated marking, but the similarity of the individual and group tasks meant the risk of plagiarism was high. Evaluation took three forms: a second-marker experiment, to test reliability and assess validity; student feedback, to examine student views particularly about plagiarism and individualised assessment; and, comparison of marks, to investigate plagiarism. This paper will discuss the development and evaluation of this assessment approach in an undergraduate mathematics context.

Classification: D65 U75

Keywords: university teaching; educational diagnosis; individualised assessment; partially automated approach; evaluation; coursework; achievement measurement; educational media; computer as educational medium; educational research; second-marker experiment; student feedback; plagiarism; problem posing
<http://www.bsrlm.org.uk/BCME8/BCME8-38.pdf>