Engaging mathematics students via e-assessment and screen annotation

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A first year module aims to ease the transition to university by starting in broadly A-level content and moving beyond this through the year. The module was redeveloped for 2013/14, including attempts to increase engagement by introduction of lecture capture (via on-screen annotation) and formative e-assessment. These changes were evaluated by two undergraduate students as their final year projects in mathematics education.

'Lecture capture' methods are ways of recording module content, in this case hand-written working. This might be from lectures, which are presented using tablet PC on-screen annotation and saved as static PDF documents, or additional materials recorded as video using tools such as a Livescribe smartpen or an iPad. There is a value in seeing mathematics performed live in real time (QAA, 2007; p. 17), so methods for capturing hand-written content in lectures and for recording short videos of mathematical exposition are valuable to students.

The evaluation gathered student views regarding different lecture techniques. Strong positive feedback was collected regarding the tablet PC lecture delivery. Feedback about supplementary material was generally very positive, especially the LiveScribe smartpen, with many students placing high value on the extra revision tools and worked examples available. Student responses regarding their lecture attendance suggested that this was unaffected by the mode of delivery for most. Mixed views were found regarding whether or not access to lecture notes online affects students' attendance.

E-assessment was introduced to provide an increase in opportunities for formative assessment and feedback, to improve student engagement with lecture content. For example, Sangwin (2012) reports a "strong correlation between engagement with, and success on, [e-assessment] formative exercise questions and final marks in traditional exams" (p. 12), perhaps due to the immediacy of the feedback compared with hand-marked work

14). However, there are serious limitations to what can be set and marked automatically (Greenhow and Kamavi, 2012; p. 3) and these need to be examined in the context of this module.

Evaluation looked at formative assessment, with particular focus on e-assessment. Interviews and a questionnaire found that students are engaging with formative assessments and understand the reasons for doing them. Summative assessment results for five questions were compared to engagement with formative e-assessment tests on the same five topics. Overall, there is an indication that using e-assessment for a topic was associated with an improvement in summative mark, though the result was not statistically significant for all topics.

A question in the conference session asked about recording videos of lectures, rather than producing static notes, because these are popular with students and there is an advantage for students being able to pause and rewatch sections. In this module, because videos of whole lectures may not be beneficial to student learning (see Rowlett, 2011, for a discussion), short recordings of key examples were used instead ■

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References

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