

Testing the effect of worked example-based podcasts on undergraduate mathematics learning in a MOOC environment

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This presentation reports on a new type of interactive online podcast within a MOOC based on cognitive load theory. Effective design of online environments for undergraduate mathematics learning was investigated as part of the project, Bite size Maths: Building mathematics capability of low SES students in regional/remote Australia, being conducted across six regional universities in 2016-2017. The project has delivered an innovative set of interactive modules (as an online learning system) that can be used singly or linked together in a Massive Open Online Course (MOOC). The project has also delivered a resource that can be embedded into undergraduate mathematics courses or courses that have a mathematics component or used on its own as a MOOC or short course. Trials for five modules have shown that the combination of worked examples and practice questions (the worked example effect in cognitive load theory) make a significant difference to test results of students with limited mathematics experience. After the initial trials, a MOOC (comprised of 20 interactive modules) was built incorporating a number of improvements and innovations. For example, this is the first time, as far as we are aware, that point-of-contact feedback, trialled and tested at Southern Cross University, has been employed as part of a MOOC. It is also, we believe, the first time that faded worked examples have been incorporated in online interactive podcasts or a MOOC. In this presentation we will report on data collected from undergraduate student volunteer participants across the partner universities during the first part of 2017. The report will focus on examining whether structuring online interactive podcasts using worked examples enhances student performance in mathematics.