Building Creative and Collaborative Assessment Strategies into a Large Introductory Biomedical Sciences Class – Evidence for Sustained Deep Learning and Potential Adaptability for MOOCs

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Background

A continuing challenge for both large class and MOOC teaching is providing creative and collaborative assessment approaches that align with course learning outcomes yet remain scalable for large class sizes of hundreds or thousands of students. Since 2012 we have been offering a first year course for over 200 students entitled “Perspectives in Biochemistry” which emphasises student enquiry, multiple context assessment and innovative approaches for development of biomedical science communication. Here, we measured the impact of collaborative and creative approaches in the context of using biomedical science drama to explain everyday biochemistry concepts to a lay audience. We interrogated the impact of creative and collaborative assessment strategies on deep vs. surface student learning using an established educational questionnaire. Subsequently, we developed the use of a collaborative narrated Prezi online presentation using a similar pedagogical philosophy which has the added advantage of global scalability.

Objectives

We aimed:
1. To develop new creative and collaborative assessment strategies into a new biochemistry course to engage students in deep learning.
2. To measure the impact of these assessment strategies on student deep and surface learning in the new biochemistry course compared to a traditional lecture/exam biochemistry course run in parallel.
3. To extend these studies using online presentation software with the potential for unlimited scalability suitable for MOOC education.

Methods

To measure the impact of assessment strategy, we used a revised Study Process Questionnaire previously proven as an analytical tool to measure student deep and surface learning (Biggs J.B., Kember, D. & Leung, D.Y.P. British Journal of Educational Psychology, (2001) 71 133-149). To provide a suitable student control cohort we compared the new biochemistry course with a more traditional biochemistry course which ran concomitantly with same intake of students. We took advantage of the switch of 3 yr to 4 yr curriculum at the University of Hong Kong in 2012-2013 to minimize variables in student cohorts as much as possible.

To develop creative and collaborative assessments in a scalable large-class setting with coworkers in offsite locations we used the presentation software Prezi (www.prezi.com). Assignments were to create a collaborative narrated scientific presentation for a lay audience including topics such as “Biochemistry in Everyday Life” or “Nomination of a Nobel Laureate”.

Results

![Graph showing the comparison between deep and surface learning approaches](image)

*Figure 1 Deep and surface approaches to learning in two introductory biochemistry courses at the beginning (week 3) and the end (week 11) of the semester as measured by revised Study Process Questionnaire.

Both cohorts of students arrived at HKU with similar preference for deep approaches to learning (Figure 1). However the students on the new course incorporating collaborative and creative approaches to assessment sustained deep learning whereas those on the traditional course switched to surface learning with impending examination. Qualitative comments from students also expressed a general, although not universal, preference for more innovative assessment strategies (see Bevan et al. for more details). Subsequent to this dataset, we have switched to Prezi instead of drama as the main innovative assessment approach with added advantage of scalability for very large classes, particularly if one were to incorporate innovative approaches emerging in peer-to-peer MOOC assessment.

Conclusions

1. Creative and collaborative assessment strategies were effective in sustaining deep student learning through the semester relative to a traditional lecture/exam comparator.
2. Using a narrated group Prezi, students can work together anywhere globally, and in conjunction with peer-to-peer assessment could be scaled without limit.

Publications from this Research


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