Blending MOOCs into Medical Education

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**Abstract**

The importance of student choice and diversity of opportunities within the undergraduate medical curriculum is clear. However, space for additional content is limited, requiring novel ways to provide opportunities for students. Massive open online courses (MOOCs) are a recent educational development which have attracted much attention, both positive and negative. As medical educators involved in MOOC development, we investigated how MOOCs can be used to increase variety in the medical curriculum. We developed a 2nd year MBChB Student Selected Component (SSC) that uses an existing MOOC, and describe our evaluation of this blended learning experience.

**Keywords:** MOOC, Student Selected Component, Blended Learning

**Introduction**

Tomorrow’s Doctors 2009 stated that at least 10% of the UK undergraduate medical curriculum should allow students to pursue medical topics of individual interest, outside core curriculum content (General Medical Council, 2009). Although this is considerably less than the amount suggested previously (General Medical Council 1993), it can still pose a considerable challenge to curriculum developers. Two of the principal ways this choice is provided are Student-selected components (SSCs) and Electives. There are several different SSC models: some schools offer a reasonably-structured group of largely research-based SSCs; while others use a more student-centred, less prescriptive approach (Murdoch-Eaton, 2004). At the University of Glasgow, SSCs are offered in 5-week blocks to students in Years 2, 3 and 4. The Year 2 SSC is almost exclusively a choice from a list of predetermined options, with students undertaking modules in such varied subjects as ‘Physiological Adaptations to Rock Climbing’, ‘Screening Programmes in Medical Genetics’ and ‘French’. In later years, students are encouraged to self-propose SSC topics, with around 20% of 3rd and 4th years doing this. Others choose from predetermined options which usually increase in clinical focus as students progress, and often include an audit or short research project, coupled with clinical experience. An overview of the SSC programme at the University of Glasgow can be found here (https://www.gla.ac.uk/schools/medicine/mus/currentstudents/ssc/).
One challenge faced by SSC co-ordinators is the timely recruitment of sufficient supervisors to ensure the availability of (in our case) over 800 SSC places per year. We have adopted several strategies to meet this demand, including increasing support for supervisors with online support methods, and running ‘recognition of trainers’ sessions to give professional recognition. However, it remains a challenge to provide enough stimulating and engaging topics. Others have described the same dilemma (McLean & Van Wyke, 2006; Riley et al., 2008).

Anecdotally, students seem increasingly aware of the relevance of SSCs in career planning, and willing to explore new topics. We decided to take a novel approach to increasing the variety of SSCs by utilizing a growing trend in education - incorporating a MOOC.

Massive Open Online Courses (MOOCs) are a relatively new phenomenon, the name originating in 2008 with the Connectivism and Connectivity Knowledge MOOC, which was based on a distributed peer learning model (https://sites.google.com/site/themoocguide/3-cck08-the-distributed-course). The first online platforms offering multiple MOOCs emerged in 2012, with EdX (MIT), Coursera (Stanford) and Udacity (Baturay 2015). Other platforms have since emerged, including FutureLearn, a UK-based Open University venture. Many newer MOOCs are ‘xMOOCs’, focusing less on connectivism and more on open-access delivery of specific subject content by experts. MOOCs are now typically 2 to 8 weeks long, and involve the learner in a variety of activities, usually over several hours per week. Activities range from the more traditional short video clips, written articles, discussion forums and multiple-choice tests, to the more adventurous, like shared content creation, peer review/assessment, and a higher degree of learner interaction. Although MOOCs were initially hailed as ‘education for the masses’, the typical learner is well-educated and often has strategic learning objectives (Christensen et al. 2013, Macleod 2014).

Initial enthusiasm about the potential of MOOCs was soon replaced by cynicism, and questioning their value and purpose. This ‘trough of disillusionment’ (Gartner 2017), however, has now led to what is hopefully more profitable exploration of the potential roles of MOOCs in education more generally (Radford, Coningham & Horn 2015).

Having designed and run the University of Glasgow’s first MOOC, ‘Cancer in the 21st Century: The Genomic Revolution’, we were aware of both its high content quality, and of the enormous amount of work involved in its creation. This initial investment led us to question whether the MOOC could be re-purposed. Several examples of re-using MOOCs in other contexts have been reported, with varying degrees of success (Swinnerton Bronwen, 2017). Clearly, reusing content for its own sake is inadvisable. However, because no SSCs currently covered the MOOC’s subject area, we decided to re-purpose our MOOC as part of a new blended learning SSC.

### Blended Learning Approach

In January 2016 we ran the MOOC publicly on the FutureLearn platform, but alongside this we ran an SSC of the same name for 16 students. Students undertook the MOOC material at an accelerated rate, completing 6 weeks of content in the first three weeks of the SSC. Additionally, three of the MOOC presenters led problem-based tutorials, to consolidate and extend on learning from the MOOC. In the final two weeks of the SSC, students undertook a group case study on the topic of cancer epigenetics, compiling a group report and giving individual oral presentations. The group case study (written and oral) comprised 40% of the overall assessment for the SSC, along with an individual essay (40%) and a piece of reflective writing (20%).

To investigate the students' experiences and perceptions of this blended SSC, we used a questionnaire-based approach, complemented by qualitative thematic analysis of students' reflective diaries. The questionnaire used a 0-10 scale with questions addressing various aspects of the SSC from the reasons they undertook it, to what they felt they had gained by doing so. The questionnaire and reflective diary were completed by all 16 SSC students (15 Year
2, one Year 4). The study was approved by the University of Glasgow College of Medical Veterinary and Life Sciences Ethics Committee (application number 200150079).

Results

Overall the response to this approach to SSCs was positive, with the analysis raising several key themes. These are summarised briefly below.

Choice: The SSC format (in comparison to other more traditional SSCs) did not appear to be a major factor in SSC choice, with the topic (cancer) rated much as more important. This may suggest that students do not view the online/offline distinction as important.

Skill versus knowledge development: The mean score for ‘did you gain new knowledge’ was 7.2/10 (‘a lot’) (range 5-10), and for ‘new skill’ 6/10 (‘quite a lot’) (range 3-9.5). Skills that students felt they gained included ‘research on databases’, ‘reflection’, ‘research skills’, ‘proofreading’, and ‘communication/group-work under pressure’. It is important that MOOCs are not seen as simply a means to deliver content, but rather that they form part of a wider strategy to address both skills development and content knowledge.

Preferred learning tools: Perhaps unexpectedly, when asked ‘what was the most helpful component of the MOOC’, the majority of students preferred learning from the written online material, rather than through watching videos, discussions or quizzes. It is notable that what educators might view as the more interactive and engaging MOOC elements, were not necessarily regarded as most helpful by students. This disparity may merit further investigation.

Self-knowledge and Self-Directed Learning: A key theme was that students were able to reflect on their learning in the MOOC context, and that in several cases, the experience had proved enlightening in terms of personal learning style.

‘It opened my eyes to different ways of learning...I plan to apply this to my future learning by making use of, for instance, educational YouTube videos and other MOOCs’

Students also commented positively on the flexibility of time and place of study that the online MOOC provided.

Interaction with educators and other learners: Finally, some students were initially reluctant to engage with the MOOC discussion forums. A feeling of apprehension, especially of ‘getting it wrong’ emerged. This may reflect a characteristic of medical students more generally, or may pertain to this particular setting. However, several students commented that they particularly valued the interactions with other MOOC participants, including patients, carers, and others. Allowing students to discuss such concerns within the safety of the class group may go some way to addressing any anxiety, allowing for more productive online interactions.

‘I do not usually use such mediums...I was worried that other users would judge my forum work negatively. However, I was surprised and relieved to find I was able to interact well with the rest of the users’

‘The diversity of the course participants meant that the complexity of the comments varied dramatically... I gained ...an appreciation of patients’ own understanding of the condition.’

SSC students also commented positively on the class-based tutorials, and face-to-face interaction with the educators.
This may reflect ‘value-added aspects’ of on-campus compared to MOOC-only learning, such as increased personalisation (tailoring tutorials to individual student needs), student cohort identity, interactions with matched-peer learners, and more interactions with experts.

**Take Home Messages**

There are several ‘take-home’ messages from this exercise. First, educators shouldn't assume that students will be confident participants in online discussions – these activities may need scaffolding. Furthermore, interaction with staff and peers is still highly valued and should not be overlooked when developing MOOC-based courses. Finally, educators should pay attention to the balance between knowledge and skills acquisition in the MOOC, when repurposing MOOCs for blended learning.

We have now built upon these results to create an ‘open MOOC SSC’ for 4th year students – a hybrid between a self-proposed and a traditional taught SSC. Students both choose the MOOC(s) they wish to study, and have a role in assessment design. This fits well with the ‘students as partners’ approach to curriculum design (Cook-Sather et al 2014). Other Glasgow University degree Programmes have trialled using MOOCs in on-campus teaching, and we are keen to compare experiences across disciplines.

In conclusion, using MOOCs as part of on-campus education may be one way to harness the potential of MOOCs – and to move from the ‘trough of disillusionment’ to the ‘plateau of productivity’ (Gartner 2017).

**Notes On Contributors**

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Appendices

Declaration of Interest

The author has declared that there are no conflicts of interest.