Learning Design in the 21st Century – Blended Learning Design Tool (BLEnDT® & MOOC-it©)

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Introduction

The increased uptake of mobile technology, access to the Internet and use of web 2.0 technologies is changing the way we access information and learn in the 21st century. On one hand, mobile technology makes access to factual information possible on the Internet anywhere, anytime. On the other hand, social media is harnessing the use of mobile technology providing access to powerful online community experiences.

Factual information that used to be owned by educators and was only available in a limited number of books in the library, is now available at our finger tips on the Internet. This phenomenon is clearly having a knock on effect on the way learning is delivered. An example of this is the proliferation of Massive Open Online Courses (MOOCs) which have the potential to become a disruptive innovation in academic institutions in the 21st century.

The effect of all of these facts is not necessarily changing the way we teach but it is making us reflect on the way we deliver traditional education. Science Minister David Willetts urged UK universities to invest in online learning through Massive Open Online Course development, in order to meet global demands (Coughlan, 2013). A recent Factsheet published by the White House in the United States on the President’s plan to make college more affordable, highlights the need to promote innovation and competition in Higher Education by the development and delivery of ‘blended’ or ‘flipped’ classrooms and by promoting the development of (MOOCs) (The White House (US), 2013).

The question is: are academics prepared to facilitate the design and delivery of these new learning experiences? Do academics know how best to ‘blend’ or ‘flip’ their courses? Do academics know what proportion of their teaching could be best delivered in a self-guided/interactive way and what could be best delivered in a collaborative way in the classroom or online, supported by the use of web 2.0 technologies?

Would academics know how to go about designing a MOOC and what pedagogic approach would be best to follow?

These rapidly evolving innovations and questions are putting pressure on institutions to come up with pedagogically sound, effective and easy to use learning design tools. This is what motivated the development of the Blended Learning Design Tool (BLEnDT©) (Toro-Troconis, 2010) at Imperial College London. The new version of BLEnDT© also includes the MOOC Learning Design Tool (MOOC-it©).

The Learning Design Tools (BLEnDT© and MOOC-it©) makes use of Bloom’s learning domains (psychomotor, cognitive and affective), in order to allocate and classify the learning outcomes required within specific learning activities (Bloom, 1956; Simpson, 1972; Dave, 1975; Harrow, 1972; Krathwohl et al., 1964).

According to BLEnDT©, the more focused the learning outcomes are on developing attitude and high-end cognitive knowledge (conceptual and metacognitive), the more the learning activities fit a face-to-face/online or Collaborative/Constructivist approach. The more focused the learning outcomes are on

**skills** development as well as on low end cognitive skills (factual & procedural knowledge), the more the learning activity can fit an interactive Self-guided/Instructional online learning approach (Toro-Troconis, 2010).

Learning outcomes are entered into the tool by selecting different verbs under different Learning Domains. The tool identifies the split between self-guided online learning activities targeting low end cognitive skills i.e. factual and procedural knowledge, as well as collaborative activities that can be delivered either face to face or online supported by the use of web 2.0 technology targeting higher order cognitive skills, i.e. conceptual and metacognitive knowledge.

Figure 1 shows the split (30% collaborative and 70% self-guided) produced by BLEnDT© for a module with 6 learning outcomes.

At the same time the tool suggests different learning activities that can be implemented in the delivery of the learning outcomes for online self-guided delivery as well as collaborative learning.

Figure 2. BLEnDT© activities suggested. CC License (Attribution-NonCommercial-NonDerivs) - CC BY-NC-ND

MOOC-it© also guides the process of identifying what type of MOOC can be designed based on intended learning outcomes. For example, xMOOCs (Siemens, 2012) have been defined as MOOCs that follow the traditional approach: materials delivered via a Virtual Learning Environment, following self-assessments and in general following activities that are facilitated closely by teachers. cMOOCs are MOOCs that follow a connectivist (Siemens, 2004) approach which means the learning experience is empowered by the networks and connections made within the course. The role of the academic is very much of a facilitator.

Figure 3 shows the split between self-guided and collaborative activities for a MOOC covering 6 learning outcomes. The figure also shows how close the MOOC is to a cMOOC or a xMOOC depending on where the emphasis falls within the X and Y axis (instructionist vs. constructivist).

Figure 3. MOOC-it© model. CC License (Attribution-NonCommercial-NonDerivs) - CC BY-NC-ND
In this case, for example, 70% of the learning materials in this MOOC can be delivered following an xMOOC approach delivered as self-guided/interactive content, whereas, the other 30% falls under the cMOOC approach which could be facilitated and empowered by the use of web 2.0 technologies.

BLEnDT© is currently used at the Faculty Education Office/School of Medicine Imperial College London and by the Imperial College Curriculum Development team - Lee Kong Chian School of Medicine.

The School of Health Sciences at City University London, the Centre for Technology Enhanced Learning at King’s College London and the University College London (UCL) are also collaborating in the use of BLEnDT©.

Methods

An evaluation was carried out in January 2013 to assess learning gains in students involved in a Blended Learning tutorial in the area of Respiratory Medicine in Year 1 of the MBBS course at Imperial College London. The tutorial was fully designed and flipped using BLEnDT© (Toro-Troconis et al, 2014). The sample analysed included 283 full-time Year 1 undergraduate medical students of average age 19 years. BLEnDT© identified the learning outcomes that were best delivered online as well as the learning outcomes that lend themselves to face to face or collaborative learning. An interactive module was delivered on Blackboard before the session. The interactive module focused mainly on revision of anatomical concepts related to Respiratory Medicine.

At the beginning of the tutorial the students completed a Pre Quiz covering the content delivered on the interactive module and received. At the end of the tutorial the students completed a Post Quiz which covered the content delivered at the tutorial. 114 students completed the interactive module before the practical (Male= 66 Female= 48).

Results

Linear regression was used to see whether students that completed the Pre and Post Quizzes as well as the interactive module scored higher marks in the final respiratory exam. After taking into account the Pre Quiz scores and the interactive module there is marginal evidence of an increase in the final respiratory mark as the Post Quiz scores increases. This shows evidence of learning gains as students engaged in the full Blended Learning programme.

Discussion

One of the main advantages that Imperial College and its academic partners have found in the use of BLEnDT© is the support that BLEnDT© provides when initiating dialogues with academics about their teaching delivery methods and potential future learning design models. The study mentioned earlier shows evidence of learning gains as students engage in a blended learning course designed using BLEnDT©.
References


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