Online Evolution: Advantages and Challenges of Online Course Components

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Abstract – “For a Copernican revolution to take place it does not matter what means are used provided this goal is achieved: a shift in what counts as centre and what counts as periphery.” – Bruno Latour [1]

As Michael Wesch pointed out in his 2008 talk at the University of Manitoba, “A Portal to Media Literacy,” the conventional lecture hall set-up reinforces an authoritarian view of education as the passive reception of scarce and valuable bits of information. [2] This is the opposite of the exploratory, questioning discovery we would like our students to have as their learning experience. The problem of the conventional lecture hall is, as well, exacerbated in large classes of 800 or more students. However, the evolution of media, from television through to online media of today, has created opportunities, challenges and obstacles that lecturers today continue to experiment with to create relevant, interactive classes - of whatever size.

At the same time, the numbers of students who can be reached with Massive Open Online Courses (MOOCs) dwarfs even our largest lecture courses and there are definite advantages that can be gained through online learning - reaching people in remote areas, enabling working people to take courses, providing credible, university-level information to any curious person who wants to learn. And while so far MOOCs may not have been uniformly living up to their promise, we do have evidence that students are using them to augment their lecture experience.

This teaching case will investigate how one large first year design/communication course has slowly incorporated online elements to shift the power dynamic from the instructor as centre of focus to the student and their learning experience as central. Begun simply, in the beginning, with audio capture of lectures, we have moved on to video lecture capture, live and recorded online help session, and supplementary videos. This last, importantly, are developed not only by the lecturers, but by interested Teaching Assistants (TA) and even students still in the course. We are, step-by-step, finding the components that will best allow students to be able to construct their own learning experience.

Keywords: Online, lecture capture, classroom response, course development.

1. HISTORY

The challenges of maintaining an active learning environment in a structurally complex, large first-year engineering design course are many. Factors limiting standard active learning techniques include: 800+ students in a single lecture section (See Figure 1); 8+1 different engineering disciplines; 48 different native languages coupled with a wide range of proficiency in English; pedagogical complexity that requires a teaching team (faculty instructors, sessional instructors, administrative staff, and teaching assistants) of 50+ people. To address these factors the course has a long history of utilizing education technology to meet student learning needs.

Figure 1: Large first-year design course in an environment not conducive to active learning.

In 2016-2017, the course had an internal review; in addition, the Faculty is opening a new building with innovative learning spaces. In the light of these factors, we hope to revise the course and to determine the balance between in-person and online resources. This paper, therefore, is intended as a kind of inventory, a step for us in the redesign of our design course.

2. INVENTORY OF ONLINE RESOURCES

2.1. Audio Lecture Capture

In 2008 and 2009, the challenge of following along with a fast-paced lecture while taking effective notes was an issue that was prevalent with, but not exclusive to, our English as an Additional Language students. Since we were already using an audio system (wireless microphone and speaker system) it was simple to incorporate a handheld digital audio recorder to record the lecture audio. Then using of freeware editing software to trim out the “dead space” on either end, we began our first experiments into lecture capture. These audio files were small enough that we could host them directly on our Learning Management System (LMS) Blackboard.

The additional effort for this audio capture had limited impact. Through tracking link accesses we found that only a very small number of students were accessing the audio captures.

2.2. Video Lecture Capture

In the fall of 2011 our course became one of the first in engineering to implement full video lecture capture. Since that time this has expanded across the faculty with all first-year courses now being recorded and many upper years courses as well. In the intervening years this has changed from being a unique situation to being part of a well-oiled machine supported by a permanently staffed education technology team. We have used several methods of hosting these videos, but currently we upload this to an unlisted Youtube Channel which we take down after the term is done. Students greatly appreciate our use of a platform they are already familiar with, and with the added controls it gives them, such as the ability to watch the lectures at double speed.

Initially we had concerns that video lecture capture would negatively impact attendance but, comparing 2011 to 2010, we found attendance patterns to be similar and these concerns unfounded. [3] However this may have been influenced by the, at the time, uniqueness of lecture capture. We suspect that because of the ubiquitousness of video lecture capture for our current first year students, that attendance may be impacted. This is a topic for a future study. Regardless year after year about 75% of our students, in our end of term survey, identify this as a useful education technology.

2.3. Virtual Classrooms / Online Help sessions

Originally office hours in this course were somewhat standard affairs, other than the size. We would book a large 300-person lecture hall in anticipation of many

students attending, especially when major deliverables were looming. Despite that we never saw the success we were hoping for and only a handful of students would attend. We speculated that it was likely influenced by the extensive number of commuter students in our student body and the logistical requirement to book these sessions after hours. With 8+1 different programs in the course it is impossible to find time during the day when all students are free.

Since geographic limitations were holding back attendance we decided to eliminate the geography. Starting in 2011, initially using a borrowed copy of Adobe Connect, we moved the help sessions online and to a time convenient for the students (9-10 pm). The success was immediate with us reaching the maximum attendees for our borrowed license in our first session. We have since moved to Blackboard Collaborate which is integrated into our Learning Management System. While Blackboard Collaborate supports a wide range of features, we have limited many of these to keep things manageable when we get large numbers. For instance, we do not allow students to use video or audio chat. Instead we limited their interactions to be through the text chat window. The instructors however use audio when answering the questions from the chat. Likewise, instead of bogging down the streaming with video of our faces talking to the computer screen we put that bandwidth to better use through the “whiteboard” tool.

We hold one to two online sessions before each major course deliverable. Attendance varies greatly from session to session ranging from a handful of students the night that they had a midterm in another course the next morning, to almost 100. While we would like to always have high attendance, this fluctuating in attendance is also useful data. When there are spikes in attendance often it is a warning sign that students are struggling to understand a deliverable.

We also record these online help sessions so many students access them asynchronously.

Our end of term surveys consistently indicate that only slightly less than half of our students access these online help sessions, but given the size of the course that means hundreds of students are seeking out additional support. We consider that a success. Of the students that do access this resource the vast majority find it useful. A small minority do not find the sessions useful, and I presume stop attending. We speculate, based on often voiced opinions, that due to the logistics we often end up answering the same question, with slight variances, several times. For a student who watches from start to finish this may reflect poorly on the session.

2.4 Supplementary Videos

There are certain topics, especially in communication, which may be highly relevant for some students but not at all relevant for others. Using limited lecture time to serve only a small number of students does not seem like an efficient use of lecture time. So, we began to create short, specialized recorded lectures on such subjects as sentence and paragraph structure. Over time, we added videos with examples of document sections as well as, last year, a video to help students prepare for the Final Exam long answer.

These videos are recorded using only a laptop equipped with an external microphone or headset and a screen capture software. We use Camtasia Studio, but there are many other options out there.

Like the lecture capture videos these, according to our end of term survey, are perceived as highly useful by our students. Well over 80% of our students have accessed these videos, and 90% of those who accessed the videos found them useful. A previous study [Bazylak et al] found that there was a pattern in how students accessed these video. There were very clear access spikes just before each major written report deliverable, but little to no access before exams. This indicates that students perceive these supplementary videos as practical but not “testable” materials. This is likely heavily influenced by the type of supplementary videos available when this was originally studied. Now with the expansion of the videos available into other “non-communication” areas, it is for future work to revisit this research question.

2.5 Classroom Response

We have been using classroom response systems in various forms for over a decade. Initially we used Iclicker which worked well after we confirmed, through trial and error, that students will not invest in buying the technology unless there are some grades attached.

The limitations of Iclickers at the time was that they were one way methods of communications. This came to light when a student design team, a team from this very course, made recommendations that if we wanted to improve student engagement we would implement a system that allowed students to use their own technology, their cell phones, to ask questions of the instructors. This was always a possibility through the standard method of a student raising their hand, but given the size of the lecture hall (See Figure 1) only the rare student has the confidence, and volume, to attempt such a feat.

Using the student team’s recommendation, we ran a trial where the instructors initially used their own cell phones and gave out their phone number, to having our own course cell phone, to adopting a software tool, Top Hat, that allowed students to interact in many ways

including through SMS texting. The details are specified in two previous papers [4-5].

3. CONCLUSION

As we move into the planning of the next major iterations of the course, we will be extending ourselves even further into online component, not in lieu of in-person components, but rather in support of them. We will adopt a customized blended learning model that will see students working in teams, already on unique projects, having the opportunity to build their own unique curriculum. If the team is designing a new workflow for a food bank, then they need to watch the human factors series of online lectures. If the team is designing a hopefully mass produced clamping system for knitting on the subway, then they need to watch the Design for Manufacturability series of online lectures. The situation also continues to evolve as new classroom and lecture spaces provide opportunities for incorporating more innovative approaches. We expect our inventory, therefore, to grow.

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