

Dealing with megaclasses in an online environment

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There is no doubt that online education is booming internationally. Recent data suggests exponential growth in online courses over recent years, with some of the biggest for-profits in the US reporting enrolments of 400,000 students. At the same time, we have seen the advent of the MOOC, massive open online courses, being offered by high status universities across the world and particularly in the US. There is much hype around this new online delivery model, and its potential to revolutionise higher education, but lack of clarity around the underpinning business model. Swinburne Online is a recently established public private partnership established to run degree programs fully online, the first venture of this kind in Australia. Swinburne Online is 50% owned by Swinburne University of Technology, and 50% owned by SEEK. Swinburne University is a research intensive university in Melbourne, Australia, recently named in the world's top 400 universities in the Academic Ranking of World Universities. SEEK is an entrepreneurial online business, which owns leading online employment market places across Australia, New Zealand, China, Asia, Brazil and Mexico. This presentation will describe how Swinburne Online is meeting the pedagogical challenge of teaching statistics to large cohorts of students online.

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1. Introduction

Earlier models of online learning were derived from distance education where instead of putting materials in the mail, documents and presentations were posted on websites and instead of mail or telephone conversations, one to one exchanges between staff and students took place via email. This learning and teaching model is largely independent or self-directed, with students taking responsibility for the identifying their own learning needs and taking the appropriate activities to meet these. However, the advent of Web 2.0 where participants can readily communicate and collaborate has enabled us to revisit the distance learning model. We now have the means to design, develop and deliver learning and teaching online which is both underpinned by clear pedagogical principals, and has the capacity to deliver a quality learning experience to large cohorts of students.

2. Pedagogy in the online environment

Socio-constructivist pedagogy

From a socio-constructivist view of learning students are regarded as active constructors of their own knowledge which is built up as they participate in experiences which are socially and culturally situated (Vygotsky, 1978).

The relevance of this pedagogy to the teaching of statistics is not new, and statistics education researchers have long promoted the use of active and collaborative strategies in the teaching of statistics (see, for example, Garfield, 1993; Keeler & Steinorst, 1995). However, over the last few years developing and ubiquitous Web 2.0 technologies have enabled these socio-constructivist strategies to be implemented in an online course.

One model for online learning that has been specifically adapted for learning and teaching with technology is Laurillard's Conversational Model (2002). The model is based on a socio-constructivist theory which emphasises the need for two-way communication between teacher and student. In order to ensure that the type of communication which occurs naturally between teacher and student in the classroom is supported in the online environment, Laurillard has identified and classified a range of interactions to be accommodated in the learning design. These are:

- narrative - the dissemination of knowledge to the learner;
- interactive – where the teacher uses feedback on student activities to consolidate learning and improve performance;
- communicative– where the tutor facilitates student discussion and reflection
- adaptive – where the teacher directs the student learning in the directions identified through the activities and feedback;
- productive – where the student actually produces something.

Salmon (2011) has proposed a highly practical and very effective five-stage model for online learning design and delivery. The stages can be summarised as follows:

- Stage 1. Students become familiar with the Virtual Learning Environment and technologies to be used.
- Stage 2. Students establish their online identities relationships are developed.
- Stage 3. Students interact with course materials and activities online.
- Stage 4. Group discussions occur and the interaction becomes more collaborative, this is where knowledge construction occurs.
- Stage 5. Students to take responsibility for and reflect on their own learning, seeking to achieve personal learning goals.

In both Laurillard's and Salmon's models the role of the expert is fundamental to the design and implementation of the online learning experience, and the development of student understanding of the curriculum.

Connectivist pedagogy

Connectivism presents learning as a process of forming connections to create networks. According to George Siemens:

Connectivism is the application of network principles to define both knowledge and the process of learning. Knowledge is defined as a particular pattern of relationships and learning is defined as the creation of new connections and patterns as well as the ability to maneuver around existing networks/patterns.(Siemens, 2012, para 2)

Connectivism has been promoted as the learning theory most relevant to the digital age. As rapidly evolving technologies enable students to both access information and build networks, what it means to “know” has certainly been questioned by educators. Traditional curriculum and assessment are challenged by connectivist pedagogy, which has been operationalised in recent years through the Massive Open Online Course (MOOC). The first connectivist MOOC, or cMOOC, was offered by George Siemens and Stephen Downs in 2008. Fundamental to such a MOOC are the following principals (Cormier, 2010; Stevens, 2013):

- Massive, so there is no limit on either the information which can be accessed, or the number and diversity of participants and their opinions. Because the numbers are large it is not possible for the course to be directed by an

instructor, participants are highly influential and the chance of making meaningful connections is high.

- Open, in that everyone can access and participate in all aspects of the course, everything is free and shared. The curriculum and activities are also open, participants are able to choose how they navigate the materials, and learning can be considered as including connections between both ideas and people.
- Online, so there is no limit to information and connections, and the process of journeying through the course can be very individual.
- Course, meaning here an event which takes place within a particular timeframe and accessed through a specific portal, but which ultimately forms the foundations of an evolving knowledge base which underpins lifelong learning supported by a network of learners.

More recently we have seen the rise of the xMOOCs, those offered by organisations such as Coursera and EdX. These courses offer students a university like experience, navigating a defined curriculum often using videos and multiple choice tests. Lane (2012) has described these as *content based MOOCs* demonstrating an instructivist rather than connectivist pedagogy, where instructivism is taken to indicate a teacher-centred, transmission of content model rather than learner-centred model. Students may form useful connections, but they can also complete the MOOC quite independently. The proponents of xMOOCs have been underpinned by significant investment from venture capitalists (Palin, 2013), and the business model which underpins them continues to be the topic of much discussion (Young, 2012). Similarly, various initiatives are underway to apply assessment to the xMOOCs, enabling students to receive credit for their studies, and politicians are openly touting the xMOOC as having potential to open the door to university education for those who have been excluded for financial or other reasons.

3. The SOL Model

Swinburne Online (SOL) is a public private partnership, established in 2011 to run degree programs fully online, the first venture of this kind in Australia. Swinburne Online is 50% owned by Swinburne University of Technology, and 50% owned by SEEK Pty Ltd. Swinburne University is a research intensive university in Melbourne, Australia, recently named in the world's top 400 universities in the Academic Ranking of World Universities. Founded in Australia in 1997, SEEK is an entrepreneurial online company which owns Australia's leading employment website as well as several other businesses associated with recruitment and education. They are currently one of the top 100 publically listed companies on the Australian Stock Exchange. The purpose of the partnership is to design, deliver and deliver high quality university programs totally online, offering flexibility and hence access to higher education to a cohort of students who are unable or unwilling to study on-campus.

For-credit University programs are constrained by accreditation processes which mandate learning outcomes, curriculum and assessment. The challenge for Swinburne Online is to use the opportunities offered by current and emergent technologies to support a learning pedagogy which is designed to optimise the student experience and maximise the students' chance of success.

The SOL learning model was developed according to this mandate, incorporating in the main socio-constructivist principles of online learning design, but at the same time

recognising the opportunities offered by technologies to incorporate open educational resources, and to build connections. The pedagogical model incorporates the following principles:

- The learning design is on technology-mediated scaffolding, learning activities in groups, and incorporating peer review and feedback.
- Learning is operationalised through an active learning environment with high expectations of engagement and contribution.
- Students are immersed in an online environment with all materials, communication, assessment and feedback mediated through digital technologies. The Learning Management System is augmented by a range of low cost and familiar applications such as Pinterest, Facebook, Twitter and YouTube. Discipline content is accessed online via eTexts, online readings, podcasts, simulations and videos.
- Students can choose where and when they study, with no requirement for students to 'attend' a specific place or be online at a specific time.

To operationalise this model SOL have made a distinction between the *design* and *delivery* of courses. Learning design is a collaborative process of adapting an existing course to the online environment, and is undertaken by a team with the following specialisms:

- Subject expertise
- Online pedagogy
- Educational technology
- Copyright
- Information sourcing
- Referencing and editing

The learning design incorporates regular participatory activities, developed using the Salmon's model for E-tivities (Salmon, 2003), which are designed to engage students not only with the learning materials but also with their peers. Shown in the box is an example of an activity which is currently included in the introductory statistics unit, which has been designed to assist students to develop their skills in statistical report writing.

How do I know what's good?

Purpose: This activity will help you as you continue to prepare for the first online test. Through completing this activity, you will be able to describe what makes a good statistical report, the components it should contain, and the issues it should address.

Task: Download the following list of [statistical reports](#). Select one from the list of four reports. Evaluate this report and provide suggestions for the student who wrote it. In particular, check that the report addresses:

- Research question or hypothesis
- Description of the sample, including descriptive statistics
- Test used, and results of the test
- Estimate of the effect size, where appropriate (ie interpretation of 95% CI)
- Conclusion which addresses the hypothesis.

Make sure you clearly identify which report you have selected in your post.

Interact/Respond: Go to the [Group Forum](#) thread "Applying Report Criteria" and respond to one other student's post. If possible, choose a post which nobody else has responded to and which has used a different report from yours. Post constructive feedback. Do you agree with

the evaluation provided and the suggested comments? Is there anything else that could have been mentioned in the evaluation?

Use the [feedback form](#) as a guide for the feedback you provide.

Time / Length: 60 minutes, to be completed by end of week 5

Students are divided into groups of about 25 for all their activities, each group facilitated by a subject matter expert, or eLearning Advisor (eLA). The formation of groups encourages interaction between group members and their eLA. Whilst the activities are mostly asynchronous, some synchronous communication takes place through scheduled online conferencing sessions. Students are also encouraged to form wider networks of learners not only within the course, but also across the program through Facebook and other social networking tools.

To maximise the learning potential of the model, both staff and students are introduced explicitly to the SOL pedagogy. All eLAs undergo an intensive online training program which has been developed and is delivered by SOL before they commence in the role. The training addresses the following objectives:

- applying the 5 stage model of social collaboration (Salmon, 2003) including the facilitation skills of summarising, and weaving;
- fostering student motivation;
- understanding the principles which inform good feedback and how to apply them;
- managing student expectations in the online environment;
- locating and evaluating appropriate resources to manage student issues;
- effectively using online educational technologies including the Learning Management System.

Students are prepared for their online learning experience through studying a course at the beginning of their program entitled *Learning and Communicating Online*. This is a for-credit course where they are introduced to the following key ideas which will facilitate their academic development as online students. This includes the use of a broad range of commonly used and freely available technologies for:

- accessing, evaluating and attributing information
- group processes, including the principals of giving and receiving feedback
- writing, creating and publishing

Through the course, the students develop the skills they need to fully participate in learning which has been designed to leverage the potential of a socio-constructivist pedagogy applied through a dynamic, connected and ubiquitous environment.

4. Conclusion

Whilst currently attracting a lot of publicity, the current MOOC models are not without challenge for participants. The cMOOCs have tended to attract those who are already knowledgeable in the content area, and have the maturity and experience to drive the connectivist network formation which is fundamental to their success. On the other hand, xMOOCs are attracting many students who are quite new to study, but the model does not provide the leaner support most students need to complete the course successfully.

Swinburne Online has been in operation since March, 2012. With course enrolments in statistics which can be close to 1000, our goal is to design and deliver courses

which are based on a sound pedagogical model and utilise the potential of modern technologies. Through the SOL model we are attempting to combine the best of the xMOOC with the best of the cMOOC by explicitly developing online learning skills in the students from the start, providing them with courses developed in alignment with social constructivist principles, and at the same time encouraging connectivist behaviours amongst students. To date, student reaction has been very positive, with student evaluation scores consistently indicating a high level of student satisfaction with both the courses and their teachers.

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