



E-Learning

Blended Learning in Large Classes

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Blended Learning in Large Classes

Through considered attention to the 'wrap around' design of your face-to-face and on-line activities (blended or hybrid approach), it is possible to be more efficient with your and the students' time. Simple on-line activities can either supplement or replace the more traditional face-to-face activities. In the large class context, you can in particular take advantage of one or a combination of the following:

- a) Flipping the traditional lecture (or equivalent resource) into the on-line space to allow for greater gains in the face-to-face aspect, i.e. more engagement, more problem solving, more complex explanation.
- b) Using the opportunity for students to learn from each other (peer learning)
- c) Using the on-line environment for automated feedback, such as using low stakes on-line short quizzes for students to monitor their learning. In combination with this is a reduction in other summative assessment.
- d) Using the on-line environment for students to generate, share or create materials
- e) Formalising the involvement of peer-tutors, i.e. more senior students or undergraduate learning assistants.

This document present a summary of ten local and international case studies. In these cases staff have used their time more efficiently in large classes without losing quality in the student learning experience. In many of these cases, staff have refocused their energies and have capitalised on the 'assessment for participation' as an approach to these activities i.e. some low weighting assessment whose purposes is primarily for student learning (formative assessment/assessment FOR Learning see <http://www.ucd.ie/t4cms/UCDTLA0044.pdf>).

A summary of the projects are represented but to see more details on the implementation and evaluation see related links/references.

Most of the examples have :

- used low cost technology with a focus on redesign. However, some have invested in some technology purchases and may have higher staff ratios than your own context,
- frontloaded work in the early stage of the design,
- measured the efficiency and effectiveness of the changes.

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Ideas and the 10 cases	Discipline, Country
Flipping the traditional lecture (or equivalent resource) into the on-line space to allow for greater gains in the face-to-face aspect	
1. <i>Flipping the classroom, flipping the culture</i>	Physics; Edinburgh & University of British Columbia, Canada,
2. <i>Using online lectures to support active learning: clickers & mini on-line lectures</i>	Pharmacy; Chemistry Curtin University, Australia
Using the opportunity for students to learn from each other (peer learning)	
3. <i>A Case Study of Online Collaborative Work in a Large First Year Psychology Class.</i>	Psychology; Strathclyde University
4. <i>Web board discussions of sample short essays.</i>	Visual & Performing Arts, Florida Gulf Coast University
5. <i>Group projects with on-line peer and self-assessment</i>	Radiography; UCD. Business; NUI Maynooth.
Using the on-line for environment for automated feedback, i.e. using low stakes on-line short quizzes for students to monitor their learning.	
6. <i>Online class-preparation and online quizzes to motivate students</i>	Introductory Biology; University of Massachusetts Amherst
7. <i>Using online environments for teaching large classes - Case study which uses group work and on-line testing</i>	Engineering & Chemistry; Australian Learning & Teaching Council (2013a)
Using the on-line environment for students to generate, share or create materials (Learning through enquiry)	
8. <i>Using wikis for student collaboration</i>	Communication & Behaviour; Swinburn University of Technology, Australia
Formalising the involvement of peer-tutors, i.e. more senior students or undergraduate learning assistants.	
9. <i>Successful use of 'paid' Undergraduate Learning Assistants</i>	Introductory Astronomy; University of Colorado
10. <i>Peer-Assisted Tutoring in a Chemical Engineering Curriculum (a credit bearing module)</i>	Chemical Engineering; UCD

The 10 Cases

Case Study 1

Title/ Author	<i>"Flipping the classroom, flipping the culture." Professor Simon Bates</i>
Discipline/ Institution	<i>Physics/ University of British Columbia, Canada, and University of Edinburgh</i>
Student No's	500 +
Key Changes & Gains	Flipping the class-room and putting lecture on-line. Using clickers (or show of hands) and paired discussion in class.
On-line component	Putting the lecture on-line and creating mini quizzes on this done the day before the interactive lecture,
Implications for you	He notes that it removes 'slavish' coverage of material and instead concentrating on the difficult material in class with feedback from other students. You need to be comfortable with more interaction in class and put materials up beforehand.
References & Resources	See TCD symposium lecture; https://www.tcd.ie/Graduate_Studies/OnlineHigherEducationSymposium/Docs/Simon%20Bates,%20Flipping%20the%20Classroom,%20Flipping%20the%20culture.mov

Case Study 2

Title/ Author	<i>Using online lectures to support active learning Dr Daniel Southam.</i>
Discipline/ Institution	<i>Chemistry for Pharmacy/ Curtin University, Australia</i>
Student No's	140 students, 1 st year
Key Changes & Gains	This case study examines how technology can be used to support an active learning strategy within face-to-face Chemistry classes. Both in-class polling software and online lectures are used as part of a comprehensive teaching strategy, designed to enable students to develop critical thinking and analytical skills. While in-class polling is not an online process, it is included within this case study to highlight how different types of technology can be used together effectively to support classroom teaching, when integrated with a carefully considered pedagogical approach.
On-line component	Mini-lectures on-line (ECHO)
Implications for you	Need to have Clickers (or alternative) and need to record mini Lecture on-line .
References & Resources	Video link: Australian Learning & Teaching Council (2013a) Using online lectures to support active learning - Case study (1st Year Pharmacy) http://online.cofa.unsw.edu.au/learning-to-teach-online/lto-episodes?view=video&video=265

Case Study No 3

Title/ Author	<i>A Case Study of Online Collaborative Work in a Large First Year Psychology Class.</i> Baxter (2007) and REAP (2007)
Discipline/ Institution	<i>Psychology/ Strathclyde University, Scotland.</i>
Student No's	600
Key Changes & Gains	<p>The three principal aims of the new programme were: a) to improve students' engagement with the subject by obliging them to begin their reading in Week 1 of the semester; b) to give them early and continuing peer support and feedback in a way practicable in such a large class, and c) to enhance students' sense of belonging to the department and the university</p> <p>Some lecture removed to allow for on-line monitoring</p> <p>This case described how student worked from an individual submission to a group submission on a variety of topics across the semester.</p> <p>For more detail son the project, see Baxter, 2007a</p> <p>For more details on the results, see Baxter, 2007b.</p>
On-line component	On-line quizzes, group project submission, class discussion and group discussion.
Implications for you	It is important to plan for the task that students are required to do. Needs some preparation for students on working on groups on-line.
References & Resources	<p>(Baxter, 2007a) <i>A Case Study of Online Collaborative Work in a Large First Year Psychology Class: In Assessment design for learner responsibility</i> 29-31 May 07 http://www.reap.ac.uk</p> <p>http://www.reap.ac.uk/reap/reap07/Portals/2/CSL/t1%20-%20assessment%20and%20the%20first%20year%20experience/effective%20feedback%20to%20550%20students/Online_collaborative_work_large_first_year_psychology_class.pdf</p> <p>Baxter, J (2007b). <i>A Case Study of Online Collaborative Work in a Large First Year Psychology Class.</i> From the REAP International Online Conference on Assessment Design for Learner Responsibility, 29th-31st May, 2007. http://www.reap.ac.uk/reap/public/Report/SU_Psychology_CR.pdf</p>

Case Study 4

Title/ Author	<i>Web board discussions of sample short essays in Understanding the Visual and Performing Arts</i> Contact: <i>Jim Wohlpart</i>
Discipline/ Institution	<i>Visual and Performing Arts / Florida Gulf Coast University</i>
Student No's	60
Key Changes & Gains	Florida Gulf Coast University (FGCU) redesigned Understanding the Visual and Performing Arts, a required course in its general education program, to accommodate enrollment growth and achieve greater coherence and consistency. Originally the course was taught primarily in face-to-face sections of 30 students each (plus two small distance sections) and utilized a large number of adjuncts. The redesigned course created a single section with a common syllabus, textbook, set of assignments and course Web site. Students were placed into cohort groups of 60 (vs. the originally planned 48) and, within these groups, Peer Learning Teams of six students each.
On-line component	- <i>Web board discussions of sample short essays</i> Students completed web board discussions where they analyzed sample short essays in preparation for producing their own short essays on the module exams. Students worked in peer learning teams of six students each to analyze two short essays corresponding to a prompt similar to the question students would get on the exam. One essay was a strong essay; the other was a weak essay. Students had to determine which was strong and which was weak and explain why. The web board discussions increased interaction among students, created an atmosphere of active learning, and developed students' critical thinking skills. -In addition to quizzes and other approaches were used in this case study
Implications for you	Hve to set up discussion forum and develop sample essays and criteria.
References & Resources	http://www.thencat.org/PCR/R3/FGCU/FGCU_Overview.htm

Case Study 5

Title/ Author	Students Web-based self and peer assessment of group work
Institution	<i>Jonathan McNulty, Radiography in UCD & Robert Galavan and Marian Crowley Henry, Business in NUI Maynooth</i>
Student No's	50 in UCD
Key Changes & Gains	<p>SPARK^{PLUS} is a web-based self and peer assessment kit. It enables students to confidentially rate their own and their peers' contributions to a team task or individual submissions. SPARK^{PLUS} not only enables students to confidentially rate their own and their peers' contributions to a team project, but also allows students to self and peer assess individual work and improve their judgment through benchmarking exercises. Being a criteria-based tool SPARK^{PLUS} allows academics the flexibility to choose or create specifically targeted criteria to allow any task or attribute development to be assessed. In addition, SPARK^{PLUS} facilitates the use of common categories, to which academics link their chosen criteria, providing a means for both academics and students to track students' development as they progress through their degree. SPARK^{PLUS} automates data collection, collation, calculation and distribution of feedback and results.</p> <p>This software was used to good effect in both UCD Radiography and Business School in Maynooth. It encouraged students to take responsibility for group work in large class contexts and helped to monitor their individual engagement in the group process.</p>
On-line component	On-line Self and Peer Assessment (used outside of Bb but can be linked from Bb)
Implications for you	This software has to be bought, but if considering 'fairness' in group projects in large classes it may be worth the investment.
References & Resources	http://spark.uts.edu.au jonathan.mculty@ucd.ie

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Case Study No 6

Title/ Author	Introductory Biology <i>Randy Phillis</i>
Discipline/ Institution	<i>Biology /University of Massachusetts Amherst</i>
Student No's	700 , 1 st Year students
Key Changes & Gains	The course redesign had five components: 1) online class-preparation pages; 2) online quizzes to motivate students to use the preparation pages and help students assess their own learning; 3) expanded use of interactive classroom technology; 4) supplemental instruction and peer tutoring; and 5) an instructor apprenticeship program to prepare new instructors to efficiently use the online and interactive technologies.
On-line component	The on-line quizzes were particularly successful.
Implications for you	Materials are required to put up on-line, however they used free resources from the web.
References & Resources	For full details on the project see cat.org/PCR/R2/UMA/UMA_Overview.htm

Case Study 7

Title/ Author	Australian Learning & Teaching Council (2013a) <i>Using online environments for teaching large classes</i> , Professor Alan Crosky.
Discipline/ Institution	<i>Engineering & Chemistry / The University of New South Wales,</i>
Student No's	700
Key Changes & Gains	When teaching larger classes, an online environment can provide many opportunities for increased student engagement, group work and self testing. In this case study Professor Alan Crosky, from The University of New South Wales, explains how he uses a blended learning approach in his Engineering Materials and Chemistry class with 700 first year students. He highlights the importance of providing student orientation and support when first introducing an online component, and discusses the benefits of integrating online tutorials and resources, group work, peer assessment and self-testing into the class.
On-line component	On-line discussions, animations on-line. Self-test questions. iPeer.
Implications for you	Monitoring on-line needed. This case has developed some animations which would require expertise, however the self testing aspects is worth seeing. Good example of group contract and group project.
References & Resources	Australian Learning & Teaching Council (2013a) <i>Using online environments for teaching large classes - Case study</i> (Engineering & Chemistry) http://online.cofa.unsw.edu.au/learning-to-teach-online/lto-episodes?view=video&video=271

Case Study 8

Title/ Author	<i>Using wikis for student collaboration</i> Debbie Weaver & Craig McIntosh.
Discipline/ Institution	<i>Learning & Communication/ Swinburn University of Technology . Australia</i>
Student No's	100
Key Changes & Gains	This case study examines how the use of a wiki can help a teacher effectively facilitate student collaboration with on-campus or distance students. It discusses the importance of providing technical support for both staff and students, planning clearly defined collaborative learning activities, and designing relevant assessment strategies to help support students develop effective teamwork skills.
On-line component	wikis
Implications for you	Need to learn how to set up a wiki and provide guidance to students on the same.
References & Resources	Australian Learning & Teaching Council (2013c) Using wikis for student collaboration - Case study http://online.cofa.unsw.edu.au/learning-to-teach-online/lto-episodes?view=video&video=245 Wikis in Plain English http://www.youtube.com/watch?v=-dnL00TdmLY

Case Study 9

Title/ Author	Successful use of 'paid' Undergraduate Learning Assistants Contact: Doug Duncan
Discipline/ Institution	<i>Introductory Astronomy/ University of Colorado at Boulder</i>
Student No's	The course enrolls 1,040 students per semester (or 2,080 students per year) in two different section configurations: four large lectures (approximately 220 students each) and two moderate-sized sections (approximately 80 students each).
Key Changes & Gains	The University of Colorado at Boulder redesigned a two-semester sequence of Introductory Astronomy to make the course more interactive and thus increase student attendance and engagement with the material. The course redesign replaced the traditional large lecture hall format with learning teams of nine students coached by undergraduate assistants in a banquet style classroom furnished with round tables and networked laptop computers. In the completed redesign, course content was delivered through an on-line astronomy text rich in graphics, animations, simulations, and links to current research activities in astronomy. Web-based materials and software were used to facilitate individual and team-based active learning

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On-line component	The Undergraduate learning assistant (senior student who received a high mark in previous year(s)) were used in the face to face component in this case study, but could have been used to monitor online discussion.
Implications for you	Are you in a position to use (paid) or develop a credited module for these senior students to assist?
References & Resources	http://www.thencat.org/PCR/R1/UCB/UCB_Overview.htm

Case Study 10

Title/ Author	Peer-Assisted Tutoring in a Chemical Engineering Curriculum (a credit bearing module) <i>Patricia Kieran, Geraldine O'Neill, Dermot Malone, UCD</i>
Discipline/ Institution	<i>Chemical Engineering/ University College Dublin.</i>
Student No's	A system of peer-assisted tutoring was introduced to the curriculum for a 4-year, professionally-accredited degree programme in Chemical Engineering. The system involves small-group, peer-assisted tutorials (PATs) associated with specific modules. PATs were initially developed to support a core 3rd Year module in Unit Operations. For the initial pilot series of PATs, Tutors (4th Year Chemical Engineering students) were remunerated for their efforts. The PATs provided Tutees (3rd Year students) with structured opportunities to work together, solving lecturer-defined, course-related problems, facilitated by slightly senior (4th Year) students. Tutors received training in directed-questioning and group facilitation and were supported with the relevant course material. The pilot series of PATs was positively received by Tutors and Tutees, with definable benefits for both groups. Based on the success of the initiative, a 5-credit elective module (CHEN40430: 'Peer-Assisted Tutoring in Chemical Engineering') has been developed for 4th Year Chemical Engineering students. For this module, the PATs system has been expanded to include another core, 3rd Year module, in Computational Methods, where PATs are implemented as computer-based sessions. This paper reports on the development and initial implementation of the Peer Tutoring module, with specific reference to Tutor-based elements and to Tutor experiences. Tutors reported improved understanding of the relevant engineering principles, increased confidence in group facilitation and a sense of satisfaction in supporting others in their learning. There is potential for implementation of the system in other Engineering curricula
Key Changes & Gains	
On-line component	
Implications for you	
References & Resources	Kieran, P., O'Neill, G. (2009) Peer-Assisted Tutoring in a Chemical Engineering Curriculum: Tutee and Tutor Experiences, <i>Australasian Journal of Peer Learning</i> : 2 (1) 4. Available at: http://ro.uow.edu.au/ajpl/vol2/iss1/4 Kieran, P, Malone D., O'Neill G (2010) Peer-assisted Tutoring in Chemical Engineering- Development of a Tutor-oriented module, <i>3rd International Symposium for Engineering Education</i> , 2010, University College Cork, Ireland.

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Additional Cases

Title/ Author	PEW Project: The Supplemental Model
Institution	<ul style="list-style-type: none"> • <u>Carnegie Mellon University</u>: Statistics • <u>Fairfield University</u>: General Biology • <u>Indiana University-Purdue University at Indianapolis (IUPUI)</u>: Introduction to Sociology • <u>University of Massachusetts Amherst</u>: Introductory Biology • <u>The University of New Mexico</u>: General Psychology • <u>University of Southern Maine</u>: Introductory Psychology
Key Changes & Gains	The supplemental model retains the basic structure of the traditional course and a) supplements lectures and textbooks with technology-based, out-of-class activities, or b) also changes what goes on in the class by creating an active learning environment within a large lecture hall setting. The following links, sorted by redesign model, include contact information, one-page project abstracts, full academic plans, full cost savings plans, ongoing progress reports and final outcome reports for each institution.
On-line component	mixed
References & Resources	http://www.thencat.org/PCR/model_supp.htm

Title/ Author	PEW Project : The Replacement Model
Institution	<ul style="list-style-type: none"> • <u>Brigham Young University</u>: English Composition • <u>California State Polytechnic University, Pomona</u>: General Psychology • <u>Drexel University</u>: Computer Programming • <u>Penn State University</u>: Elementary Statistics • <u>Portland State University</u>: Introductory Spanish • <u>Riverside Community College</u>: Elementary Algebra • <u>Tallahassee Community College</u>: College Composition • <u>University at Buffalo (SUNY)</u>: Computer Literacy • <u>University of Central Florida</u>: American National Government • <u>University of Colorado at Boulder</u>: Introductory Astronomy • <u>University of Illinois at Urbana-Champaign</u>: Economic Statistics • <u>University of Iowa</u>: General Chemistry • <u>The University of Tennessee, Knoxville</u>: Intermediate Spanish Transition • <u>University of Wisconsin-Madison</u>: General Chemistry

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Key Changes & Gains	The replacement model reduces the number of in-class meetings and a) replaces some in-class time with out-of-class, online, interactive learning activities, or b) also makes significant changes in remaining in-class meetings. The following links, sorted by redesign model, include contact information, one-page project abstracts, full academic plans, full cost savings plans, ongoing progress reports and final outcome reports for each institution.
On-line component	Mixed
References & Resources	http://www.thencat.org/PCR/model_replace.htm

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