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The SEALLS Project: A Case of Blending in Technology to Enhance Student Engagement and Achievement in Large Lecture Settings

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The context and its challenges

Teaching hundreds of students in a large lecture setting presents some obvious challenges: capturing and holding students' attention, creating opportunities for genuine engagement and interaction with – and among – students, providing timely and effective feedback on learning, and much more. The challenges are greater still when the course has students from three campuses and requires several audio and video-feeds to tune in those students. Imagine further that this course is a compulsory one for Stage One students, most new to the University and as yet uninitiated in its ways of seeing and doing.

It is against this backdrop that I assumed the duties of director, coordinator, and primary lecturer of EDUC 119 *Development, Learning and Teaching* in 2012. At that time, the course had a history of approximately 15% of its roughly 400 students not completing or failing it. Such a rate might not seem alarmingly high, particularly in some disciplines, but for a mandatory foundations course in education – in which one only needs to earn a 50% to pass – it is somewhat disconcerting. The concern heightens when one considers that an additional 30% of students barely passed the course (earning only C's), and that these students are preparing to be teachers.

The goal and the means to achieve it

With this context and its challenges in mind, I set out to make changes to EDUC 119. The overarching goal of the changes was fairly clear: to increase student achievement. More precisely, I wanted to increase student learning and to see this reflected in a shift in the distribution of grades with fewer students failing or 'underachieving' (the C's) and more students earning A's and B's. The means of achieving this goal were less certain or definitive. From an educational psychological perspective, one of the obvious ways to increase learning and achievement is to engage them in their learning.

Conceptually, student engagement has been defined in three distinct ways:

- Behavioural (e.g., attending – or failing to attend – lectures and tutorials; participating in all course-related activities; taking notes and asking questions; studying and completing all assignments on time).
- Cognitive (e.g., psychologically investing in one's learning; being strategic and reflecting on one's learning processes; going beyond the required and seeking to master the content or skills to be learned).
- Emotional (e.g., being interested in learning and seeing it as valuable; feeling joy and/or excitement about what one is learning).

So my goal was to make changes that would increase achievement by increasing learning through greater engagement.

Two things became immediately evident. First, digital technologies offered answers to a wide range of the *how-to* questions inherent in the challenges presented in this context. EDUC 119 needed to be redesigned from a traditional large lecture structure to a 'blended learning' approach. To increase students' behavioural, cognitive, and emotional engagement with the course — its concepts and theories, requirements and assessments, lecturers and tutors, and other students — we needed to adopt and integrate digital technologies like robust learning management and classroom response systems.

The second immediate reality was that restructuring the course was a substantial undertaking and I couldn't achieve it quickly or alone. As fate would have it, Dr Steve Leichtweis, the Manager for the Centre for the Creative Application of Technology in Education (CreATE), reached out to me shortly after my first year of making changes to the course. Steve, along with two members of his staff, Nicoletta Rata and Damon Ellis, were eager to help me with transforming EDUC 119. Steve also asked Dr Kirsten Locke, who was coordinating EDUC 118 (the other large lecture course required of Stage One B.Ed teacher education students) to join the budding team along with Dr Catherine Rawlinson and Michael Willimott from the first year experience team. Each of these individuals has played an important role in the work of the SEALLS Project. Finally, the successes of the project would not have been possible without the excellent team of graduate teaching assistants, professional teaching fellows, and lecturers on EDUC 119. All were instrumental in both the redesign and delivery of course.

Blending in technology: The redesign of EDUC 119

As alluded to above, the redesign of EDUC 119 centred on transforming the course from a traditional large lecture course to a 'blended learning' experience. According to Garrison and Vaughan, "Blended learning is the thoughtful fusion of face-to-face and online learning experiences...[that] represents a restructuring of class contact hours with the goal to enhance engagement and to extend access to Internet-based learning opportunities" (p. 5). Specifically, in our redesign we fused the existing four hours of face-to-face learning experiences per week (two hours in a large lecture setting and two in small tutorial groups with 30 or fewer students per week) with a series of on-going online learning experiences throughout the semester. These experiences included participation in:

- Five short (approx. 15 minutes each) online activities related to the theories and research being discussed in the course readings or lectures.
- PeerWise, a web-based program that allows students to create questions and explain their answers as well as answer other students questions and rate them.
- Two online quizzes (20 items each with a mix of true-false, multiple choice and fill-in-the-blank questions).
- One essay assignment with peer review (note: tutors and students were encouraged to use Turnitin's PeerMark, Originality Report and GradeMark to facilitate review and marking process; they were not required to do so, and very few did so).

In addition to these required (graded) activities, students could engage in a number of other (optional but strongly encouraged) online activities. These options included downloading course resources (e.g., the course booklet, assignment guides, and lecture notes) and posting questions or observations in the student discussion forum or the 'online office' – a forum that I hosted to address any and all course-related queries and comments, conceptual or procedural. Finally, students were encouraged to bring a WiFi-enabled device to lecture so they could interact with me and each other through GoSoapBox (a Web-based classroom response system that allows students to answer polls I've created, post questions of their own, and use an anonymous 'confusion barometer' to indicate uncertainty).

From a pragmatic standpoint, perhaps the most important decision we made (and made very early) in pursuit of this goal was to adopt a robust learning management system (LMS), Moodle 2.7. It allowed us to design an inviting and easy to navigate online platform for the course. Prior to the redesign, we had used CECIL, the University of Auckland's bespoke (and now obsolete) LMS, which we used in a very limited fashion – the posting of lecture notes and a few course announcements (one-way communications to students by course staff). As detailed above, with Moodle we were able to facilitate more readily two-way communication between course staff and students, create opportunities for students to discuss amongst themselves, conduct online assessments of student learning, provide students with (more immediate) feedback on their learning and allow them to monitor their progress in the online Gradebook.

Given our interest in studying students' use of the foregoing digital affordances – 'action possibilities' as Gibson defined them – Moodle had one other strategic advantage over CECIL and most other LMSs: a strong learning analytics program. As described in the NMC *Horizon Report*, "learning analytics leverages student-related data to build better pedagogies, target at-risk student populations, and to assess whether programs designed to improve retention have been effective and should be sustained" (p. 24). Specifically, we employed the use of the Moodle Engagement Analytics Plugin (MEAP) that allowed us to readily access data on student login activity, viewing or downloading of course resources, posting of questions or comment in the discussion forums, accessing and completing of course assessments, and use the Gradebook, amongst others.

We used these learning analytics in two distinct ways: proactively (while the course was running) and retrospectively. With respect to the former, the scope of our use was very limited: we treated student login activity as a 'risk indicator' and reached out to students who hadn't logged on to the course website within the first two weeks of the semester. This modest intervention resulted in approximately half of the students we contacted initiating engagement online and the other half formally withdrawing from the course (as they were encouraged to do if they did not intend to complete the course). While we may have wished to retain more of those students, we were generally pleased with the result of this low-cost effort to engage students. However, our primary interest in the data we collected was for retrospective study. It is the results of these analyses – to which we next turn – that offer the most promise with respect to understanding students engagement with the digital affordances available and the impact of this engagement on their learning and achievement.

Questions, findings, and reflections

So, what did we discover from this redesign of EDUC 119 into a blending learning course and its implications for student engagement and achievement in large lecture settings? In this final section, I offer a brief summary of our results and what they mean as well as my reflections on the process and findings as a whole.

Here's what the data tell us: more 'clicks' = more total marks. That's oversimplifying matters, but not altogether inaccurate. More precisely, the data tells us that it is active-assessment related activity that is positively associated with total marks. In contrast, passive activity (i.e., non-active viewing or 'lurking' behavior), while correlated with achievement at the bivariate level, does not contribute any unique variance in total marks. That is, after we 'controlled' for important background and enrolment characteristics, only active-assessment activity remained a significant predictor of student achievement. This finding is not a surprising one – it makes sense that engagement with the digital affordances available would be associated with total marks earned, and that active engagement in assessment-related resources and activities would be the most powerful type of engagement.

Our findings also indicated that the final grade distribution for students in the blended offering of EDUC 119 was significantly different from the final grade distribution for students completed the course in 2012 (before the redesign was initiated). More specifically, significantly fewer students failed the course (i.e., 'Did Not Sit' or earned a D) in 2015 compared to 2012. The difference was very large difference (4.4% vs 15.6%, respectively), and one that we believe is attributable (in part) to the integration of digital affordances. Particularly important in reducing the number of course failures was our proactive use of the learning analytics related to students engagement with those affordances – allowing us to readily identify and reach out to students who weren't engaging in them.

It is also clear that there was significant (50%) increase in the number of A's earned in 2015 compared to 2012. Interestingly, there was not a significant change in the C's or B's earned. The resulting pattern suggests that the learning and achievement across the distribution of the grade range was enhanced: students who might have earned B's were able to earn A's instead and they were replaced by students

who might have earned C's but instead earned B's, and they, in turn, were replaced by those who would have earned a D or not completed the course. While we can't say with certainty that this shift was a result of the course redesign, the data presented here strongly suggest it played a role, a modest one, perhaps, but enough to lift some students out of failure and help others achieve excellence.

Finally, our data indicate that students' subjective experience in the blended course was overwhelmingly positive: 72% agreed or strongly agreed that it got them 'more actively involved' in the course and 74% agreed or strongly agreed that it made them 'feel more connected' to course lecturers. This is, of course, what we had hoped for in adopting a blended approach: that creating more opportunities for students to engage in the course would lead to more active involvement in it as well as a greater sense of connection to its lecturers.

In closing, I want to offer a few brief reflections of the redesign process and the findings just described. First and foremost, the redesign of EDUC 119 required lots of thought, time and effort. I could not have done it alone and would strongly encourage anyone considering a similar undertaking to seek the support of others (particularly the kind of dedicated and knowledgeable professional staff that I have been so fortunate to have on my team). Second, there are several key principles of instructional design and learning that not only undergirded the choices we made in our redesign but also help explain the positive findings it yielded. Chief among these principles is that learners' motivation and engagement is enhanced when they feel or experience a sense of: 1) control, choice and voice in their learning; 2) belonging and social connection to other members of the learning community; and 3) efficacy or capability with respect to achieving the learning goals and tasks to be accomplished – in a word (or three), what Deci and Ryan call *autonomy*, *relatedness*, and *competence*, respectively. From a humanist perspective, these are basic, innate psychological needs, and all three can be enhanced through blended learning. Third, and finally, while work presented here is unique in the particulars of time and circumstance, it is not especially innovative or complex. At this point in time, the use of LMS's among postsecondary educators to organise and disseminate course resources is ubiquitous (and often mandatory). Though much less so, CRS's are widely used as well. In short, the technology is in place to effectively blend learning. It needs only to be harnessed thoughtfully in a pedagogically sound and developmentally appropriate manner.

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