

Engaging Nutrition and Dietetic students with food science – Using PebblePad to deliver a flipped course

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The Context

This case study describes the process taken to transition a traditional didactic food science course to a fully flipped course delivered in PebblePad.

NUT201 Food Studies is a required course for students in both the Bachelor of Nutrition (BNut), and Bachelor of Nutrition and Dietetics (BN&D) at the University of the Sunshine Coast (USC). The aim of this course is to introduce students to food science; particularly how processing influences the sensory, biological, nutritional and chemical properties of food, with Australian food law woven throughout as a key theme. The course is usually taken in the first semester of second year and requires a pre-requisite of chemistry. The NUT201 cohort typically includes between 90 and 100 students, who range in age from school leavers to mature age and are predominately female.

The Problem – engaging students in the learning experience

This course has traditionally been taught in a didactic manner with students expected to attend a 2-hour lecture and 2-hour kitchen workshop (held in the teaching kitchen) each week, over the course of the semester (13 weeks in total). The lecture has traditionally been designed to provide and discuss information related to the weekly learning outcomes, while the kitchen workshop allowed students to participate in related practical experiences (e.g. seeing a chemical reaction take place while cooking a food).

While students have always been provided with pre-class activities (i.e. readings), over the period of 2014/2015 it became apparent that students had limited engagement with these activities prior to the lecture. Consequently, their first exposure to most of the content was in the weekly lecture, leading to most of this time being devoted to explaining food science concepts, with

minimal discussion of the application of this knowledge. Attendance at both the lecture and the kitchen workshop also decreased over the course of the semester, which had implications not only for student engagement and learning, but also for resourcing (e.g. food items, equipment). Several reasons for this lack of engagement and attendance were identified through discussion with the cohort.

The varied background of our students, including the number with family commitments and those who are required to work, means our students are busy. At the beginning of second year students also report a noticeable increase in study workload. Additionally, many of the students enrolled in NUT201 have returned to study after a break of some kind, and approach science, in particular chemistry, with some trepidation. For these students, more time was required to process the background chemistry required for this subject. Simply introducing food science in the lecture was not providing students with enough time to think about and discuss these key concepts. Students also experience difficulty in understanding food law, a language in itself.

Given these factors, it was decided that several strategies could be implemented in an attempt to get students more engaged with this course. These included using the flipped classroom approach and integrating a task using PebblePad. Hence, it was decided that the NUT201 course would be taught with a partial flipped classroom approach in 2016, and fully flipped in 2017. This enabled students to undertake part of the learning process at their own pace, and encouraged the use of technology.

Part 1: The Flipped Classroom Approach

In 2016, the NUT201 course was partially flipped. A 2hr lecture and 2hr workshop were still provided each week, however the lecture was considered an interactive activity. The course was delivered with the following structure: *Prepare* – pre-class activities undertaken in the students' own time (i.e. narrated PowerPoints, credible videos sourced online); *Participate* – an interactive lecture where students and the teacher undertake a range of activities together (i.e. welcome, recap on previous week, Quick Quiz using an online platform, recap on last week's case study, weekly learning outcomes and three activities) and the kitchen workshop (practical activities); and *Recap* – A case study designed to apply knowledge acquired from the weekly activities. This was delivered on Blackboard, the platform used at USC.

To attempt to engage students with food law, an assessment using PebblePad was incorporated into the course. Task 2: The Food Studies Portfolio was a PebblePad workbook that contained 12 pages (one for each week). Students were expected to undertake 3 – 4 tasks each week that linked the weekly content to relevant food law. For example, students were asked to access the Food Standards Australia New Zealand (FSANZ) website and find food law relevant to food labels, or were expected to identify products in their local shop and describe how food law was applied in this case. Students were required to attach evidence of their activities by uploading images (photos) in the PebblePad workbook.

Students provided overwhelmingly positive feedback on the structure of the course and resources provided (particularly the PebblePad Food Studies Portfolio). A survey of the class found that 87% felt engaged with the course, 78% felt that the way that the course was delivered had improved their non-academic skills (e.g. collaboration, communication). Additionally, over 70% of the class agreed or strongly agreed that having a PebblePad Portfolio assisted their learning in this course, while 100% of the class agreed or strongly agreed that they had become more confident that they could locate information on the FSANZ website; had increased their food knowledge, understanding of food production and processing; had become more critical of nutrition information and more confident in searching for sources of nutrition information. This example of PebblePad use also earned the author a USC Advance Award for Learning and Teaching (Advancing the Blended Learning Environment, 2016).

While the course was received positively, there was still a decrease in attendance, particularly in the lecture over the course of the semester. Due to the interactive nature of the lecture design, this disadvantaged those students who attended. This promoted teaching staff to fully flip the course in 2017, removing the lecture.

Part 2: Scaling Up - Using PebblePad to deliver NUT201 Food Studies

In 2017, NUT201 was fully flipped. The course continued to follow the structure of prepare, participate and recap, however the 2hr lecture was removed, while the kitchen workshop was increased to 3 hours in duration. The first hour of the kitchen workshop was devoted to discussion of the weekly learning outcomes and clarifying information from the pre-class tasks, while the final 2 hours were used for practical cooking activities.

As the course was fully flipped it appeared to be an ideal time to look at how students accessed learning materials and resources. While USC uses Blackboard as a learning delivery platform, it can be difficult to make this look visually appealing to engage students. As such, the original Task 2 Food Studies Portfolio was scaled up to a workbook to deliver the full NUT201 course.

The new workbook contained a series of 14 tabs, one as a welcome, and one per week. Each of the weekly tabs included a drop-down menu with 6 pages:

1. Weekly overview – a list of the weekly learning outcomes with tick boxes to record progress.
2. Pre-class activities – a page with embedded narrated PowerPoint presentations/videos, list of readings with check boxes to record progress.
3. Class activities – a page with the weekly workshop activities, the recipes used and space to record findings/answers in class.
4. Post-class tasks to integrate food law - the Food Studies Portfolio used in 2016.
5. Recap – a nutrition specific case study to practice application of key learning.
6. Extra notes – a page for attaching extra information, i.e. photos of food prepared in the workshop.

Each week was opened automatically 7 days before the next workshop so that students had time to complete the previous week, and prepare for the upcoming week. All learning resources, i.e. notes used in class, were uploaded into the workbook by staff, minimising the number of areas students needed to access.

The assessment task used in 2016 (Task 2: Food Studies Portfolio), was expanded so that the workshop activity and post class tasks tabs were marked. Students were expected to complete these pages every week, and at three points across the semester one of these weeks was chosen at random for marking (3 weeks in total). This resulted in better attendance throughout the entire semester.

Using the workbook to deliver the course allowed students to collate all the course materials and work in one space. This allowed for creation of an artefact that could be used in future study, or as evidence of learning in this area which was viewed positively by students. Using the workbook across the entire semester also meant that students became more familiar with technology (a graduate attribute at USC), and less paper was used as the traditional kitchen manual was no longer required.

While the 2017 use of PebblePad is yet to be formally evaluated, the Student Evaluation of Teaching and Courses (SETAC) received positive feedback. While some students noted the amount of time and commitment required to complete a flipped classroom course, there were positive comments regarding the delivery of this course, i.e. [what I most appreciated about this course was...] *the way that PebblePad had been set out each week with the preparation, workshop, and self-directed tasks.*

From a teaching perspective, delivering the course within a PebblePad workbook also had many advantages. Previously, unless a student provided information on how much work they had completed, it was impossible to know how many students had recently accessed the learning materials. ATLAS made it possible to check student progress and engagement, and mark within the workbook, resulting in more efficient use of time. Better attendance rates were seen when the course was fully flipped. This example of using PebblePad has been shared with USC colleagues, and has also formed the basis of other workbooks used in the N&D discipline at USC.

Lessons Learnt

This approach requires a significant amount of time, both for the development of resources (i.e. short videos) and in developing the PebblePad workbook. However, once the workbook is developed it can be used in subsequent years with small updates as required. One of the main learnings was that the entire course needed to be mapped out based on the weekly tab structure before starting to develop the workbook.

The students in this course had used PebblePad for a blogging task in the previous semester, so had some experience in using this platform. However, there was no formal process for directing students to support, which made it difficult for both teachers and students when trying to address problems. A small number of students quickly became disillusioned with the workbook if a solution to their issue was not identified in a prompt manner. In future, having a formal and structured process for directing students to the appropriate support would be useful. This is also important for teaching staff, particularly in cases where sessional staff have not used PebblePad. It is important to encourage and allow students time to use the workbook and PebblePad more widely so that they feel familiar with this platform for learning and can pre-empt issues.

As students were expected to use the PebblePad workbook in class time, and submit assessment in this form, several electronic devices were able to be purchased and left in the teaching kitchen for use when required. This was a major consideration in the decision to use PebblePad to deliver the course as it was important that no student would be disadvantaged.

Take home messages about 'Scaling up'

- If a course has a different content focus each week, a workbook with weekly tabs can provide students with a structured resource for recording and storing valuable information. It is also an engaging and visually appealing method of delivering a course
- Scale up progressively – it takes far more time than anticipated!
- Students need time and assistance to learn how to make the most of PebblePad

To view further case studies from PebbleBash 2018 please visit <https://bit.ly/PB18PUBS>