Case study title: Flipping the Classroom

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Summary
This case study is focused on 'Flipped Classroom' approaches to learning, which enhance active learning and engagement in the classroom. In flipped classes, core material is delivered before the class, e.g. by video. Face-to-face class time then is used to reinforce and develop those concepts.

Background
I felt that lectures were too passive an experience and did not support learning. Lectures are an effective means of information delivery, but most students do not learn effectively from them. I therefore wanted a process which engaged students more in active learning and inquiry.

Approach
When I first tried the flipped approach, there was no existing practice, it was entirely new in Cardiff. I therefore developed the approach using trial and error. The approach I have taken (which is common for flipped classrooms) is to record the core information content on a video. This means that students watch the video in their own time and can make notes on it at their own pace – pausing and rewinding if they need to. I surveyed the students when I first tried the approach, and in subsequent years, and they were overwhelmingly enthusiastic. In particular students with reading/writing/learning disabilities and international students benefitted from the process.

- *Alternative solutions considered and their relative merits;*

Alternative approaches could be:

Standard Lectures: These are limited in interaction between learners and between learners and staff. The content retained by the students is likely to be minimal.

Small Group Teaching/Tutorials: These have the potential to enhance active learning (used to good effect in the Medic C21 programme), but are a significant investment in staff time and resources. Small groups may mean that there is not a subject specialist facilitating the learning activity, and are better geared towards problem-based or case-based learning approaches which are student-led.

Online Learning Platform: This could encourage active learning, but would miss the benefit of having a subject specialist there in the room to facilitate and support the learning.

Blended Learning (enhancing lectures with technology): A meta-analysis of research into technology-enanced education approaches, undertaken in the USA, has shown that flipped classrooms have proportionately more reports of beneficial outcomes to learning than any other blended learning methodology.

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- *Resources put into the solution;*

There is a significant outlay of time initially in setting up the pre-class information delivery medium (e.g. preparing materials or recording videos). However, once these are created they are possible to keep on a long-term basis, with only minor updating. Therefore there is only really the initial outlay of time.

Initially I used Camtasia as a video-recording tool, which is very powerful for editing material. However, the new Panopto system invested in by the University is much easier to use, and very fast to get to grips with. The outlay of time is therefore pretty much only the time it takes to physically record the video.

There is also a small outlay of time in preparing worksheets or activities for the face-to-face class, but this is minor.

- *Communication of change to students/colleagues.*

Communication to Students: This is **absolutely essential** for the approach to work. You **must** :

    a) Tell the students what you are doing and what is expected of them (e.g. do pre-reading or watch the videos)

    b) Explain to the students *why* you are doing this, and why it is beneficial to their learning to engage in active learning.

    c) Explain to the students that they will not get as much out of the live classes if they don't watch the videos before-hand.

    d) Explain to the students that the intention of the flipped approach is to save them time reinforcing material after the class. So you are not adding to their workload by getting them to do the pre-class work, you are merely shifting their workload.

Communication to Colleagues:

a) Let colleagues (especially module leaders) know that you are doing this.

b) Encouraged people to get involved and give it a go.

Outcomes

Students **loved** it. I have had many enthusiastic responses from students (especially dyslexic students), and the approach is regularly praised in module evaluations, personal evaluations and student-staff panels.

Some students did not engage with the approach, and I particularly noticed that if other big coursework deadlines were looming around at the time, then the flipped videos were seen as a low priority by some students.

I noticed a definite spike in video usage before the lecture and before the exams, suggesting the videos are a useful revision tool.

One student complained that watching the video took longer than a lecture would normally take, as she was pausing, rewinding and going over things again. When I explained to her that this was a *benefit*, as that was something you could not do in a lecture, she realised what she was saying and changed her opinion!

Learning points and insights

Some things to ABSOLUTELY AVOID:

1) **Don't** use this as a reason not to deliver the live class (i.e. don't just record a lecture and put it up).

2) **Don't** go over exactly the same material in the "Live" class that you did in the pre-learning. Otherwise students will stop doing the pre-learning. Develop ideas, reinforce information, test the students' understanding and then answer any problems. Don't just give the lecture again!

3) **Don't** use the "Live" Lecture to *add more core content*. There is a temptation to just see the pre-learning as a chance to increase the overall content. No! Keep the same content, but reinforce it and develop the students' understanding.

4) **Don't** make the "Live" Lecture a worthless exercise by either not doing anything that enhances the learning experience or just abandoning the live discussion.

Things to be prepared for:

1) Be prepared for silence. Most students are not used to talking or discussing in class, or answering questions. If they don't volunteer an answer, wait for them to do so.
2) Be prepared for noise in the classroom and have a method for gaining control of the situation again once everyone is talking.
3) Be prepared to think on your feet. This is the fun part of the approach, where you can shape the live class as the situation or the needs of the class dictate. It is more fun for the lecturer as well as the students.
4) Have an idea of the activities you want to do in the class before the class begins.

Tips:

- I tend to give quizzes to the students during the live sessions. Initially I had this as a 'pub quiz' at the start, but it is better to do small quizzes of a few questions several times.
- You can use quizzes and questions to direct the content of the live lecture. Audience response systems work well for this: Ask a question, obtain students' answers, get the students to discuss the answer, ask the question again, and discuss the answer.
- Get the students working together. You can do this in large classes of several hundred people. Get them to stand up and turn around, sit on the desks, or talk to people next to them. Tell them to make noise!
- Several short videos are better than one big one.
- Don't worry about making videos perfect professional quality. Just record it and don't worry about umms and ahhs….
- Try to have some active activity the students do whilst watching the videos. Something to engage them in the process.
- Explain to the students what you are doing, and why, and what is expected of them.

- Don't do this as a one-off. It works best when used as an activity in a series of classes (4+)

Activites that work well in the live class:

- Asking quizzes and discussing the answers as a group;
- Going over areas the students traditionally find difficult to understand. You can help find these out either by your own experience, exam results, by asking students to nominate things they want to go over, or by looking at the 'viewer statistics' on Panopto for your video. These will show you areas of the video the students have watched more than the others;
- Planning an exam essay answer to a question;
- Asking students to pair up and explain a process/concept to their partner;
- Setting an applied question (e.g. "You want to devise a drug against this organism, which of the following cellular pathways would you target?…");
- Discussing the research that led to the discovery of the information;
- Telling a story from your own experience;
- Role playing acitivity to reinforce a concept;
- Get the students to write an exam question on the subject;
- Problems for students to work out in groups
- Get students to research gaps in the pre-class information using books, phones, computers and tablets;
- Get a series of students to explain aspects of a concept to the rest of the class;
- Get students to work together to argue against an idea or disprove a theory.