THE UNIVERSITY OF WARWICK

Original citation:
O'Toole, Robert (2013) Flipping the classroom : a design study of the adoption and adaption of new pedagogy in a Higher Education context. Working Paper. University of Warwick, Coventry: University of Warwick. (Unpublished)

Permanent WRAP url:
http://wrap.warwick.ac.uk/58050

http://wrap.warwick.ac.uk

Robert O'Toole FHEA, Senior Academic Technologist
ITS Academic Technology Service
http://www.warwick.ac.uk/academictechnology
academictech@warwick.ac.uk
November 2013

THE UNIVERSITY OF
WARWICK

Flipping the classroom

Aims of this paper

This is a design study of the Flipped Classroom idea as it appears at the University of Warwick in November 2013. The study has two complementary aims:

1. To identify design propositions (as ideas or implementations), based upon the Flipped Classroom idea - design propositions that are viable and appropriate for use in specific disciplinary and interdisciplinary contexts at Warwick.
2. For readers to evaluate the usefulness of the idea of the Flipped Classroom in their own contexts, and where possible, to create design propositions based on the idea.

We are looking for smart, precise, well targeted uses of the Flipped Classroom approach, rather than a blanket notion that academic technologies will improve things across the board. These precise applications are encapsulated in "design propositions", which may describe an implemented design or an idea for a new design - but always in a specific context for a clear and well stated purpose.

The first draft of this paper was presented to a mixed audience of 24 Higher Education teachers, researchers and academic technologists as part of the Teaching Grid's *Window on Teaching* series. In the session we considered three documented designs (two from Christian Smith in English and one from David Beck in History). The participants undertook a Design Thinking activity to describe design propositions that follow or resemble the Flipped Classroom pattern (either new or already implemented). The resulting designs have been added to this paper, along with a further variation from Chemistry. All of the participants in this study are listed at the end of the paper. We are deeply grateful for their contributions.

Scope of this study

This study is part of ongoing work by the Academic Technology team at Warwick, aiming to embed adaptations of the Flipped Classroom approach into practice. This is the first stage in the process, looking for viable, appropriate design propositions - where we describe an arrangement of practices (including technologies) that:

- will **fit** with the concerns, projects and practices of real people in real contexts;
- will **stick** in use for a reasonable time, within a reasonable cost (time, effort and money);
- can easily **spread** to other people and contexts, thus increasing the design's value;
- and allows us to further **grow** our capability for improvement and innovation.

Robert O'Toole FHEA, Senior Academic Technologist
ITS Academic Technology Service
http://www.warwick.ac.uk/academictechnology
academictech@warwick.ac.uk
November 2013

THE UNIVERSITY OF
WARWICK

We will be focussing primarily on the "fit" aspect of the problem: where exactly does the idea of the Flipped Classroom fit with existing concerns, projects and practices? Or alternatively, what variations of the idea fit, where? And how might concerns, projects and practices change through Flipped Classroom designs? This is the first phase (or space) of the Design Thinking method - the Inspiration Space - in which participants share stories, define and refine design challenges, and imagine possible design propositions. We will subsequently start to consider stick, spread and grow, as well as the important question of how we assess implementations of designs to evaluate their success in meeting the needs of learners and teachers, although we are still at the early stages of the design process, looking for inspirations and to form initial design challenges - to appear in follow-up sessions and papers (the Ideation and Implementation phases) as our Design Thinking develops.

This paper does not cover the technical details of how to record lectures. There are many ways in which this can be done, with a large decision-tree of considerations to go through on the way to choosing an approach. We can help Warwick staff with this in one-to-one Ideation and Implementation sessions.

The basic design proposition

The Flipped Classroom idea is simple: the students consume lecture content as videos or audios individually in their own time, freeing-up lecture time for more interactive and constructive pedagogies, with the students being more engaged and active in class. This assumes that classroom time, or in the HE context lecture time, is normally used for the transmission of content from the teacher to the students, and that a state of student inactivity can be replaced by additional opportunities for student activity. The starting point of the argument is that classrooms are insufficiently interactive and constructive, being overburdened by the need to cover lots of facts and examples. It is assumed that homework is the student's main opportunity for interacting more constructively with the material, and that this happens mostly in isolation, with little socially interactive learning. The Flipped Classroom originates in the US High School context, where this might be the case, and where the challenge is to get students more engaged and more active in their own learning - or as is often the case, to keep them in schools, productively occupied, unarmed and off the streets.

Does this fit with the Higher Education context? Specifically anywhere in Warwick? To a great extent seminars should already provide a significant opportunity for students to be more active and engaged. Furthermore, self-directed study should, for most students, deal with the problem of coverage, with lectures focussing-in on more detailed expert-led examinations of key elements of the curriculum. It might also be the case that lectures are important social learning events - this has not been established either way. Considering the existing nature of H.E.

teaching and learning, are there still times and places where the Flipped Classroom model has significant **fit**? Do we still need to make more time for active learning? Or is the lecture always an ineliminable social learning event?

Reviewing the design studies

The Flipped Classroom idea is not entirely alien to teachers at Warwick, or at least amongst those attending our workshops - even if the terminology may seem a little strange. Anecdotal evidence suggests that teaching practice is far more diverse than the tripartite default of reading-lecture-seminar. Even within those core methods there is significant variation. Lectures are not always about the transmission of content, but they are not always the best method for achieving other ends. There is already a recognition of the need to mix and blend teaching methods as required. All of the participants in the study demonstrated an active *designerly* awareness of student needs, especially as they result from the uneven epistemological landscape of their disciplines - looking for topics and challenges that stand-out as additionally troublesome, error-prone, significant or engaging. In Paul Taylor's Chemistry case, the learning designs have developed to allow teaching to continuously adapt to problems (or possible problems) as it proceeds. This happens within challenging logistical conditions caused by cohort size and students on placements. Similar logistic challenges are motivating learning design innovation in Psychology (Claire Haworth) and the Warwick Medical School (Catherine Bennett). In the cases from History (David Beck) and the Centre for Lifelong Learning (Sara Hattersley), the Flipped Classroom is used strategically to help address specific recurring challenges in the curriculum, challenges of the kind described as *threshold concepts*. Christian Smith uses variants of the approach to raise student participation in seminars and as a more effective way of helping students to engage with the most contentious *liminal concepts*. **The Flipped Classroom idea is useful as a strategy for making time and space to address difficult or important areas of the curriculum, and for enabling sophisticated learning design.** The practical challenge of covering/understanding the full academic context (and beyond) of a topic, and at the same time making focussed progress with key concepts and skills, is well recognized. **Flipped Classroom designs can help teachers and students to balance broad coverage and at the same time to focus on detail.**

The Flipped Classroom idea has arrived at Warwick into an open-minded and (to some extent) designerly environment in which similar practices are already common, with some important differences. As the design cases described in this paper illustrate (below), it fits into a wide variety of contexts (in all Faculties), with a range of smart design adaptations. We need to recognise the diversity of these cases, and most importantly, that the Flipped Classroom is a design strategy or style, or a new way of describing existing practice, rather than a single solution. There will be no single Flipped Classroom design to be implemented. There is no single

Robert O'Toole FHEA, Senior Academic Technologist
ITS Academic Technology Service
http://www.warwick.ac.uk/academictechnology
academictech@warwick.ac.uk
November 2013

THE UNIVERSITY OF
WARWICK

technology format, platform or solution required. Many specific design questions need to be developed and investigated, so that we can provide the best advice for each individual case. For example: when should audio be used? when video? with slides? of what length should the recordings be? how might they benefit from in-built interactive elements? and are there cases when it would be better to provide text as the medium into which content transmission is flipped? Text is a more familiar medium in Higher Education. There are common techniques that allow us to make the most of it (for example speed reading). Audio, video, slides, text - each has different affordances, constraints, enabling constraints and flows. We need a much more granular and empirically informed understanding of the implications of each of these design choices.

The design propositions presented in the seven design study cases listed below go some way to illustrating the diversity with which Flipped Classroom style teaching is occurring. They provide a good starting point for thinking through the design issues involved.

Design 1: students as producers (English)

John Fletcher is the convenor of the English Department undergraduate module EN335 "Literature and Psychoanalysis". It is quite a conventional optional humanities module, surveying the topic through a range of texts and perspectives. This might be taught using a combination of lectures (from the course convenor) and seminars (typically led by research students or post-docs). The students are expected to contribute to the seminars with presentations based on the lectures and their own research. Over several iterations of the module, John has moved to recording lectures as audio and providing the recordings to the students in advance (we have supported this in the English Department by providing MP3 recorders through various channels). In the past, the audio recordings have been distributed through the module website (created using Warwick's Sitebuilder system). Texts and commentaries were distributed by email. In 2013, Christian Smith (English Department teaching fellow and seminar teacher) has set up a Moodle site for the module, with texts, commentaries and audio recordings organised into weekly sections. The students can respond to each text, commentary and recording with questions and discussion.

This has some of the elements of the Flipped Classroom. However, another aspect of Christian's Moodle practice makes it especially interesting in the HE context. Each week Christian uses Moodle to assign the seminar presentation task to a student. The student is then expected to upload their presentation file in advance of the seminar to Moodle. The other students then have access to the presentation before, during and after the seminar. The Moodle is used during the seminar to establish a continuity between the online and physical spaces. Not only does this improve the logistics of the module, it also addresses a significant common concern: student participation in seminars. The use of the Moodle space to store everyone's

THE UNIVERSITY OF
WARWICK

presentation files, students and teachers, equalises the roles of all participants. The students are now visibly seen to be contributing content on more of an equal footing to the teacher. They are all responsible for making the module, as constructed in the shared space.

In this case, the Flipped Classroom fits quite neatly with the teacher's current practices, with the addition of some Moodle knowledge and skills (not a major challenge). It also fits with an important and common concern: student seminar participation. Furthermore, as Christian argues, it fits well with the project of developing the students as active disciplinary practitioners rather than mere passive consumers of lecture content.

Design 2: making time for threshold concepts (History)

David Beck teaches the 2nd year History module "Politics, Literature and Ideas in Stuart England". In Week 6 he will be looking at the political philosophy of John Locke in the context of the reformation. Unfortunately, he will not be able to do his scheduled seminar sessions in that week. So, instead, he is going to audio record his lecture in advance, and provide it to the students online, so as to free-up the lecture slot to be used in a workshop format. The role of the classroom, or rather the lecture theatre, is to be flipped.

The lecture isn't simply being replaced with additional seminars. A lesson design is to be used that aims to address a significant and common concern: how to help history students to get to grips with philosophical texts so that they can understand the role of those texts and the ideas presented in them within the historical context being examined. It is not sufficient for history students to know facts about Locke and his work. In order to understand, assess and create hypotheses, in the way that historians do, the students need to be able to know the primary sources from the inside. Getting inside primary source texts is an essential route to an active engagement with history. In fact texts of this kind represent our best opportunities to live inside the worlds and minds of the past. David's teaching aims to get the students to think and act as historians, rather than just to learn about history (in sociological terms, we could say that becoming a historian is the project with which he wants them to engage). But to do so, they have to think and act in ways that may seem alien. David's design proposition is that through this experiential learning, enabled by Flipping the Classroom, the students are supported a bit more in their becoming historians.

David is responding to a potentially disruptive logistical problem - not being able to do the scheduled seminars. But there is more to it than that. He has reflected upon a common class of problems in history teaching, which is this:

History students need to have a first-hand experience of reading and actively constructing their understanding of Locke (and other historical works of philosophy). To do this, they need to

Robert O'Toole FHEA, Senior Academic Technologist
ITS Academic Technology Service
http://www.warwick.ac.uk/academictechnology
academictech@warwick.ac.uk
November 2013

THE UNIVERSITY OF
WARWICK

master a different way of reading, more usually associated with studying philosophy. This might not be the kind of history work that they are used to and expecting. But as is often the case in the Humanities, disciplines cross into each other providing complementary perspectives. The knowledge of how to use and apply this trans-disciplinary skill constitutes an essential "threshold concept" (Meyer and Land, 2012) which may lead the student to a breakthrough in understanding and capability.[1] However, it is also often encountered by the student as "troublesome knowledge". To overcome this, confidence and capability needs to be built-up quickly and carefully, closely supported by the feedback and expertise of the teacher and by peers.

The challenges that face teachers and students in dealing with threshold concepts are well documented. In this case, the students might respond by disengaging from what they see as "alien" knowledge and practices, perhaps adopting a "compensatory mimicry" that is superficially convincing but ultimately veils a failure to engage fully (Meyer and Land, 2012: Kindle location 892). David's use of the Flipped Classroom approach brings him closer to the students as they tackle these challenges, giving him valuable additional opportunities to ensure that they pass across the knowledge threshold safely and effectively.

Will it stick and spread?

David Beck is a competent IT user and an experienced teacher. There is a good chance that, if this works (or provides the basis for an enhanced version), he will use the approach in the future when dealing with similar threshold concepts. However, there is no guarantee that he will get to teach this module again. Technology is not a barrier, audio recording is simple to do. However, we might question the value of providing an audio recording rather than simply a text of the lecture - the students might be expecting a performance, and this might be a cultural barrier that cannot be ignored. Spreading the practice to other modules and other teachers is less likely. Recording lectures in advance is not a major challenge. The additional work required for the more intensive whole-class workshop is quite an additional challenge. The point to emphasise is that this is undertaken to deal with an especially challenging aspect of the module. If the method is established as giving significant advantages in dealing with such challenges, there is a greater chance that it could spread.

Design 3: from online lecture, through individual and small group response, to whole-class learning (CLL, teacher training)

---

[1] "A threshold concept can be considered as akin to a portal, opening up a new and previously inaccessible way of thinking about something. It represents a transformed way of understanding, or interpreting, or viewing something without which the learner cannot progress. As a consequence of comprehending a threshold concept there may thus be a transformed internal view of subject matter, subject landscape, or even world view." (Meyer & Land, 2012: 435)

Robert O'Toole FHEA, Senior Academic Technologist
ITS Academic Technology Service
http://www.warwick.ac.uk/academictechnology
academictech@warwick.ac.uk
November 2013

This design has been implemented by the Centre for Lifelong Learning (Sara Hattersley, E-learning Manager), and has been found to work well in this context. It has been created to address a concern with a specific element of the training of adult literacy teachers. It has been found that "coherence in writing" is a difficult concept for the adult literacy learners and the trainee teachers to understand. Each trainee teacher needs to master this *threshold concept*, and develop strategies and techniques for helping students with it. However, there are major time pressures, with the trainees only meeting for training once a month. Flipping the classroom helps with these challenges. They begin with an online screencast created using Snagit (screen recording with narration). The screencast explains the concept. The students listen to this at home. They then have two homework tasks associated with the screencast:

1. An analysis of their own writing, which they write about and blog and get tutor feedback on the blog, and queries and questions are dealt with online, privately on the blog;
2. Analyse a real adult literacy student writer's piece of writing, bring that with them to the campus session, and discuss it in small groups to decide which areas of grammar, coherence etc they would prioritise as a teacher. They then go on to talk about methods for teaching those particular things.

They go from an individual approach at home, to a small group, to a whole group approach in the classroom. Some of the work has been transferred into the homework context, alleviating the time pressures, but also allowing for more reflection, experimentation with methods and a longer more considered learning process. This longer transition from an individual engagement with the difficult concept, through small groups, and then on to whole class, could help the students with confidence worries.

Design 4: liminal concepts in the Humanities (English)

Christian Smith and Joe Jackson (English Department) teach on the core first year undergraduate module EN123 "Modern World Literature". As a first year module, EN123 is quite a challenge for students and teachers. It is supposed to be. For each week of the module, the students read and try to make sense of a major text, ranging from Faust to contemporary fiction. And at the same time, they need to be getting to grips with the concept of "modernity". However, modernity is not a fact, or a simple term defined in a dictionary. It is highly contested and complex, as is often the case with humanities concepts. There are many ways into it, many ways out to other concepts and the non-conceptual, and new possibilities to be invented along the way. The module includes contributions from a range of academics from the English Department, using approaches grounded in a variety of disciplines (including economics, politics, psychoanalysis, history and philosophy). Each academic has their own perspective on modernity, with each new contribution destabilising the student's nascent understanding. It's even more challenging than the *threshold concepts* described by Meyer and Land. The complex

THE UNIVERSITY OF
WARWICK

and unstable nature of the concept of modernity renders all viewpoints on it contested and forever liminal. But the ability to use the concept critically and creatively, and to work with other similar concepts, is essential to becoming the kind of critical and creative scholar that is the point of studying in the Humanities.

How might academic technologies and the Flipped Classroom idea help teachers and students to successfully address such a big challenge? Christian and Joe have reflected on the "traditional" means by which the module is taught, and decided that the conveyor belt of reading that the students face right from the start does not leave enough time for students to constructively experiment with and reflect upon the concept. This is a common problem in literary studies. In her chapter in *Exploring Signature Pedagogies* (Gurung, Chick & Haynie, 2009), Nancy Chick describes the default pedagogy of literary studies: "professorial packing", where the professor presents a reading of a text pre-packed with their own reading and own agenda. This is contrasted with the signature pedagogy (the approach that fits best with the discipline) of "unpacking", where students and tutors work together to unpack a text critically and creatively (Chick, 2009: p.42-43). It is common practice for lectures to follow the "professorial packing" approach and for seminars to be expected to use a more student-led "unpacking" approach, but with a disconnect between the two.

In this module, lecture time is taken up by adding new perspectives from a wide range of voices. Seminars are occupied with helping the students to deal with the texts. Christian and Joe's response has been a sophisticated kind of Flipping. Lectures and seminars continue as before, but additional materials and activities are added within a "Modernity Clinic" based within Moodle. The additional space reduces the students' dependency on the lectures and the readings, and provides them with additional pathways into the concept of modernity. It achieves this through a range of methods. Not all methods will fit with all of the students. The important thing is that every student finds something that works for them. This builds upon Christian's use of Evernote as a shared repository for student work-in-progress, used in workshop based seminars in the Teaching Grid's Experimental Teaching Space at Warwick.

In the clinic the students are presented with a range of texts, images and videos, each of which can provoke a response from the student in which their understanding of modernity is developed and applied. The texts include key texts from theorists of modernity with conflicting views and approaches. The images are an eclectic selection, carefully chosen. The students are encouraged to post new images, suggesting how other students might respond to them, and initiating further critical discussions. Video is used in a more creative way than might be the case in conventional Flipped Classroom. Short videos have been created with Warwick academics talking about their views on modernity and the texts. This encapsulates in a single place contrasting views and styles, for example from Stephen Shapiro and Thomas Docherty. Finally,

8

Robert O'Toole FHEA, Senior Academic Technologist
ITS Academic Technology Service
http://www.warwick.ac.uk/academictechnology
academictech@warwick.ac.uk
November 2013

THE UNIVERSITY OF
WARWICK

a further technique makes this interpretation of the Flipped Classroom especially effective. Although the seminars are still linked to the long series of big texts, the Modernity Clinic is sometimes displayed on the screen in the seminars (along with the Evernote notebooks in Christian's workshop sessions), meaning that the materials within it and the responses from the students can be used to enrich the seminars and to connect them with the students' developing concept of modernity. This approach has spread amongst some of the ten seminar tutors on the module, to varying degrees (with some not adopting it at all).

Design 5: more effective use of on-campus time for distance learners (Medical Teacher Training)

This design (from Catherine Bennett) is for experienced medical practitioners learning to teach. They are from a wide variety of backgrounds, but are all new to teacher education. Some work would be needed to ensure that the students understand this new way of learning, and are clear on how they should best use the online lectures. It might be the case that some of the students have had a long gap since they last did a university course, and this could mean that they are surprised by new teaching and learning methods. The students need to understand that time is scheduled in to the module for them to listen to the recordings, but it is up to them to plan their own timetable to ensure that they do this effectively. They are distance learning students, geograpically distributed around the country, embedded in their professional working contexts, and coming to the University campus for short periods. The idea is to provide online lectures for the students to watch and to reuse before they come to the campus, and then to use their time on campus for more interactive, supported working. The students would be able to use the lectures in their own contexts, reflect on them, and bring their ideas and questions to the campus sessions. The lectures would be created as audio, video, or slides with audio, choosing the most appropriate format in each case (simple audio has the advantage of affording more flexible consumption, for example the student can listen whilst they are driving a car). The teaching team would want to see reports identifying which students had accessed which recordings, although it is not clear if they would want to know any more detail (for example, tracking progress through a video).

Design 6: flipped classroom with very large lecture cohorts in the sciences (Psychology)

This design (by Claire Haworth) might be used with a large group of 120 third year undergraduate students on-campus. The module has 120 students receiving 30 hours of teaching in total, 10 hours of which needs to be "highly interactive". Third-year psychology modules usually follow the tripartite format of independent reading, a lecture by the module convenor and a seminar led by a researcher and/or the module convenor. In this case, instead of

THE UNIVERSITY OF
WARWICK

the usual 2 hour lecture and a seminar every week, lectures will be recorded and the additional time used for working in three smaller groups. The additional group-working will be led by the module convenor. The aim is to improve interaction and to achieve a deeper understanding of the concepts. It is predicted that the students will value the opportunity for more interaction greater than the liveness of the traditional lectures.

Design 7: equitable access to lectures, FAQ of video edits from workshops (Chemistry)

Paul Taylor teaches a core module for 3rd year undergraduates. The lectures cover a lot of content and challenging ideas. Some of the students are also on work placements at the same time. There is therefore a need to make access to the lectures more equitable. Paul is replacing live lectures with recorded lectures, creating a single medium for all of the students to access. The Camtasia system is used to record the lectures. The students are given readings to do each week. This is supported by online quizzes and video clips (on Youtube) embedded into the quizzes to clarify the answers. There is also a frequently asked questions page, which includes videos. Initially, this was focussed upon covering all of the key points in the lectures. It is now used in a more focussed manner, dealing with concepts and issues that the students find difficult, and with which they make mistakes - misconceptions, as opposed to deeper more significant *threshold concepts*. Live workshop sessions are recorded using Camtasia. After the session, Paul creates shorter videos from the longer recording, edited to cover topics that the students have found to be difficult.

Texts and links

Meyer, Jan & Land, Ray (2012), *Overcoming Barriers to Student Understanding: Threshold Concepts and Troublesome Knowledge*, Routledge.

Meyer & Land's original paper from 2003 on Threshold Concepts is freely available online at:
http://www.etl.tla.ed.ac.uk//docs/ETLreport4.pdf

Gurung, Regan. Chick, Nancy. & Haynie, Aeron (2009), *Exploring Signature Pedagogies: Approaches to Teaching Disciplinary Habits of Mind*, Stylus.

Chick, Nancy (2009), "Unpacking a Signature Pedagogy in Literary Studies" in *Exploring Signature Pedagogies*, p.36-55.

For more information about academic technologies at Warwick, see:
http://www.warwick.ac.uk/academictechnologies

Robert O'Toole FHEA, Senior Academic Technologist
ITS Academic Technology Service
http://www.warwick.ac.uk/academictechnology
academictech@warwick.ac.uk
November 2013

THE UNIVERSITY OF
WARWICK

For further information on implementing the Flipped Classroom, see:
http://tinyurl.com/pdpazw9

To arrange a one-to-one design conversation with an academic technologist, email:
academictech@warwick.ac.uk

Contributors & participants

Judith Baum, Centre for Professional Education.
Catherine Bennett, Warwick Medical School
Antony Brewerton, Library.
Zhiqiong Chen, Language Centre.
Chris Coe, Academic Technology Team.
Weerahannadige Fernando, Learning and Development Centre.
Mohd Hafiz Md Hanif, Centre for Education Studies.
Michael Hammond, Centre for Education Studies.
Sara Hattersley, Centre for Lifelong Learning.
Claire Haworth, Psychology.
Sally Howard, Centre for Professional Education.
Peter Jennings, Warwick Medical School.
Jim Judges, Academic Technology Team.
Kirsty Kift, Library.
Lisa Lavender, Learning and Development Centre.
Emily Little, Learning and Development Centre.
Yi Liu, Warwick Business School.
Steve Locke-Wheaton, Library.
Katsuko Nagata, Language Centre.
Helen Neal, Warwick Manufacturing Group.
Robert O'Toole, Academic Technology Team.
Maria Do mar Pereira, Sociology.
Clemencia Rodas-Perez, Centre for Hispanic Studies.
Lauren Schrock, Warwick Business School.
Christian Smith, English and Comparative Literary Studies.
Paul Taylor, Chemistry and the Institute for Advanced Teaching and Learning.
Rebecca Woolley, Library.