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Flipping the classroom: Old ideas, new technologies

Ralf Becker[a,*], Alvin Birdi[b]

[a] University of Manchester, United Kingdom
[b] University of Bristol and The Economics Network, United Kingdom

ABSTRACT

The technique of classroom flipping has started to make an impact on the teaching of economics. An important element of classroom flipping is that elements of active learning (e.g. games, experiments and polling) are brought into the classroom setting and that content delivery is moved (at least partially) from the classroom to the virtual learning environment.

This paper discusses the developments that have prepared the ground for the increasing uptake of classroom flipping, namely technical innovations and a better appreciation of how students learn.

In our view the flipped classroom approach has significant promise beyond the already existing implementations, mostly by enthusiastic teaching staff. As many of the technical challenges have been solved it is now the willingness, the availability of time, and the recognition and reward of any effort to change the delivery approach that will prove to be the most significant hurdles for further adoptions.

1. Introduction

The technique of classroom flipping, by which the sequencing and nature of learning and teaching is configured in novel ways, has started to make an impact on the teaching of economics. To the extent that flipping involves a substitution of active learning methods for traditional lecture delivery, one might have expected a far earlier adoption of flipping techniques by economists. For some time, the pedagogical resources available to and being used by economists have included an array of active learning methods such as classroom games, experiments, polling software, data-based investigative work and the use of multimedia resources[1]. These are precisely the kind of methods that one can envisage supporting a flipped classroom pedagogy.

Indeed, the UK Economics Network has been advocating and training lecturers to use classroom games, polling software and multimedia in their teaching for well over a decade. Such active learning methods do not come without cost however. The real price of their adoption, and perhaps the reason for their lack of widespread use, is the freeing up of time within the traditional lecture or class. Flipping the classroom, in the sense of moving some material outside the classroom, provides an obvious complement to active learning techniques in that it is oriented towards making time available in formal teaching sessions for more active learning. If flipped learning has pedagogical benefits, economics as a discipline should be uniquely positioned to receive them.

This special issue of *IREE* collects some papers that aim to bring understanding to a method of learning and teaching whose methods and implementation, not to mention learning benefits, are not yet fully appreciated. Partly this lack of understanding arises from a sense that the teaching of economics has never been entirely didactic. It has always involved at least an element of flipping in that students have traditionally been asked to work before the tutorial, particularly on solving exercises and problems but also in

* Corresponding author.
E-mail address: ralf.becker@manchester.ac.uk (R. Becker).

[1] See for example the movie-based resources at http://dirkmateer.com/media-library.

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reading, in order to actively discuss these problems in class.

Nonetheless, many instructors will be aware that the ideal of active discussion of exercises and papers in the traditional method has often faltered either because of lack of student preparation or because of a tendency of instructors to lapse into a mini-lecture format in their classes. Many instructors report exactly these problems in the training that the Economics Network delivers in the UK each year. Indeed, a portion of the Network's training each year is devoted to addressing the challenge that teaching sessions, particularly small group sessions, remain active and student-focused.

It might therefore be said that the idea of flipping discussed in these pages differs from the traditional method only in that it makes use of video technology and other multimedia assets to motivate out of class student engagement, but that in its nature and intent it is fundamentally the same. We do not disagree that certain elements of flipping have always been part of a properly configured pedagogy because the benefits of students engaging with material in active ways has been apparent for a very long time. However, though the elements of a flipped approach were always with us, at least in principle, the resources at our disposal to enable the success of the approach are richer and more readily available than at any previous time. As a result, there is the possibility that flipping may involve a more significant transformation of economics education than at any previous time.

We understand flipping in education to be a multi-faceted approach to the activation of student learning which involves an equally important consideration of what happens before and after the face-to-face class as within it. First, unlike many traditional courses in which lectures often cover material before students are asked to engage with it actively, there may be a re-sequencing of content so that students are set to work on material before it is treated in any depth by a lecturer. Second, the material made available to students is often in the format of videos or podcasts which, when complemented with traditional reading material, may enhance the motivation of students to engage with it. Third, this material may originally have featured as part of the content of a traditional lecture but which has been removed from the lecture to create time for other activities. Fourth, there is often deliberative activity within the classroom such as peer-to-peer instruction, the use of games, directed group study or team-based learning designed to be undertaken with varying degrees of instructor direction. Fifth, there may be specific material that is left for students to work on after the face-to-face session.

These elements in themselves contribute to increased student engagement with the material that is being taught. Evidence that just changing the classroom is not what is required can be found in Green (2014) which suggests that merely changing the classroom to activate learning may not be beneficial. Equally, just moving the content delivery from the lecture to online may also be ineffective or even detrimental (Green, 2014; Cosgrove and Olitsky, 2015).

In summary, the mature approach to flipping challenges the teacher to reconsider the complete design of a course rather than simply reorient its delivery. The fuller consideration involves the appropriate nature and location of learning activities within the parameters of both time and space. It may no longer be enough to think of what content belongs where and in what order. Rather, one will need to consider which student activities will be most conducive to learning and whether such activities are better placed before, during or after the face-to-face session, and moreover what kind of interaction with the material and with others is required. In this sense, flipping necessitates a fundamentally student-focused approach to engaging with content rather than an approach which is centred on the delivery of that content by staff in a methodical and long-established sequential manner.

2. What has changed?

Lectures in which educators deliver content to students have been the mainstay of University education across centuries and continents. In some way this is astonishing as the effectiveness of lectures, even as a content delivery mechanism, has been questioned for some time. In a lecture on economics lectures John. B. Taylor (Stanford University) notes that such questioning dates back at least to the 18th century writer Samuel Johnson.

At least two changes in recent years have laid the ground for the emergence of the flipped classroom. These are technical innovations and a better appreciation of how students learn. The idea that students learn best when they are *using* and activating their knowledge is now well-accepted (see the meta-analysis by Freeman et al., 2014). As noted above, there are various aspects of the economics discipline that have for some time lent themselves to active learning and in recent years these aspects have been further supported by technological developments.

Economics is increasingly reliant on game-theoretic thinking and this aspect of the discipline lends itself uniquely to classroom games or online experiments. The subject has always been empirically oriented[2] and the increased availability of data and ease of access to suitable software has made the practice of statistical and econometric estimation and investigation within classes possible. The conceptual and technical nature of the subject lends itself to the kind of multiple choice questions that polling software (and indeed the kind of peer-instruction method discussed by Arico and Lancaster in this issue) was developed to support. The problem is not the lack of possibilities for active learning but freeing space to actually use them.

It may be the ability of individual lecturers to easily produce online videos to replace the lecture delivery of content that has facilitated the move to flipped learning more than any other change[3]. When material is delivered in this way students lose the ability

[2] This empirical aspect of economics was somewhat perhaps surprisingly, neglected in the past in favour of a more theoretical approach. This is now changing and the CORE project (www.core-econ.org) has developed a significant re-sequencing of the taught economics principles course emphasising its empirical and hands-on aspects.

[3] In most cases these videos would be delivered to students using a virtual learning environment (VLE) which is another important enabling technology for flipping. However, VLEs have for long been used to support the delivery of traditionally structured courses and it is the combination of such technology with embedded video technology that makes a flipping approach easier to develop.