Small steps on the journey to “flip”

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Abstract:

This reflective case study focuses on the implementation of the "flipped classroom" in the context of large quantitative second year module. More specifically, I propose to share a very gradual and nuanced approach, which can be of interest to those who are already convinced of the benefits of the "flipped classroom" but are concerned as to how to approach it. This intermediate solution or a "semi-flipped" approach should be particularly relevant in the context of the post-pandemic teaching environment. The key idea is to select the relatively simpler parts of the course for bitesize pre-recordings for students to engage before the lecture, while the more challenging material, requiring more comment and interpretation, is discussed in a more traditional way. The main expected benefits are two-fold: (i) students have the opportunity to familiarise themselves with the foundations and terminology at their own pace, enabling them to be better prepared for the more advanced material and (ii) there is more time and space in the lecture room for the discussion of this more advanced material.

Introduction

The aim of this case study is to describe my experience of the "flipped classroom" (FC) approach to teaching in the hope of encouraging others to consider it in different contexts, which may be felt as a particularly daunting or challenging task for large cohorts of students and in some of the technical or quantitative subjects. Using the example of a second-year undergraduate compulsory Microeconomics module with over 400 registered students I will illustrate that the FC approach can still be used, and that the teaching **does not all need to be "flipped"**.

The FC approach has been implemented in a variety of contexts since late 90' (see, for some examples: Lage et al., 2000; Mazur, 2009; Brame, 2013; Uzunboylu & Karagozlu, 2015, Schell & Mazur, 2015); its merits have been discussed and demonstrated multiple times across a variety of subjects and levels of study (Roehl, 2013; Rowley & Green, 2015, Strelan et al., 2020). A useful literature review is offered by Little (2015); and while the debate may persist on the costs of implementation vs the relative benefits for learners for specific subjects/circumstances, I will neither discuss it nor provide any evidence to address this question. Instead, I will focus on the practicalities of the implementation, taken as given that the decision to take interest in the flipped approach is already made and bearing in mind some of the

reservations colleagues may have (as, for example, discussed in Dumont (2014) or in the excellent reflective account by Towey (2015) of a failed FC design in a particular context of computer science course).

The starting point

The key idea of the proposed approach is simple and in line with the original proposal of E. Mazur: the relatively easier content of the module is provided in bite-size pre-recordings, while the more complex (and often more interesting to discuss) material is presented during the interactive session with the students. However, I argue that we are currently in an advantageous position to attempt such an approach as a considerable number of courses *already have* all / most of the material pre-recorded due to the actions taken during the Covid pandemic. This is not to say that those recordings can all be used "as is"; but they do present a wealth of material as a starting point, a draft that can be edited (which is easier than to start from scratch).

Implementation: Small and simple does it

The first interesting nuance that I propose is to carefully select the relatively simpler elements of the most fundamental material (and thus the material that is less likely to change, especially for beginners and intermediate technical courses), to edit it into "bitesize" sections, embedding, if possible interactive elements (for example, Panopto videos allow for simple embedded quizzes). This selection will constitute the "pre-recorded" part of the course. Noting that studies (e.g. Harrison, 2020) have argued in favour of bitesize videos due to the attention span and psychology of feeling "the progress" in learning, I do not propose to agree or argue with this view, which has been met, in my personal experience, with strong opposition from colleagues. Rather, I consider the merits of bitesize recordings to be for me as a teacher as well as the students: having small sections would enable the teacher to assemble and re-assemble the course, editing a small fragment rather than a long recording of a video, thus providing more flexibility. This should also enable an increase in the potential mix of teaching materials, remembering to have some/sufficient interactive elements (embedded quizzes in the VLE being the most straightforward to incorporate).

It is important to note that the selection of material should focus on the **relatively simpler parts** of the course, rather than exclusively on theory or descriptions. The division 'theory vs practice', if applied to selection of the material, is likely to (i) devalue the theory, as something secondary, that can be learned in one's own time and (ii) confuse learners where more complex theoretical concepts are presented, lessening the opportunities to ask questions and to ask for additional explanations. I do not have a theoretical underpinning for the above - it is only suggested by my own experience. The next practical question that may arise is how one is to know what is "relatively simpler"? To this, I have only one answer: experience and observation. The relatively simpler material is that which has in the past generated relatively fewer questions from students.

Discussion: Thinking before speaking

The second nuance that I propose to discuss is the engagement with students during the "flipped" lecture. When I first attempted to "flip" the classroom, I believed that I had to interact with every (or nearly so) student - which is, of course, challenging for any course with more than 50 students. I now hold a different belief: it would be sufficient to (i) give a good number of students the opportunity to interact (for example, to answer a question/problem set) and/or (ii) invite students to talk to each other for 5-10 minutes (ideally, about the lecture; this is a peer learning approach). Let us look at both types of interaction in the context of a large quantitative lecture from the perspective of a student: answering (or even asking) a question in front of one's peers is intimidating, daunting, and generally not accessible to many types of learners (those who are shy of their knowledge, accent, background, etc.) While we always encourage our learners to participate, by being both inviting and approachable, we are not, and cannot be, in control of their fears, prior experiences, etc. especially when there are 200+ peers (not to add that the lecture may be recorded, adding to the potential stress of speaking up). Additionally, and no less importantly, it takes time to process the question or presented content, to think of an answer or a suitable question, to formulate it and to gather the courage to speak up.

To summarise the arguments above, I believe that for an "interactive lecture", learners should be given time to think/process before an interaction is expected. Giving 5-10 minutes of thinking alone, or when appropriate, talking to a neighbour, enables relatively shyer learners to talk; and gives time for everyone to formulate a question or an answer. Is this time wasted? Is this a break for the lecturer? I argue, that **thinking time** is not time wasted; and that this is far from a break for the teacher. The second part of the argument is easy to defend: while students are chatting, make your way round the room (especially to the back of the room) and chat with some students, perhaps giving some hints, etc. Thus, it is not a break; rather, it is a good opportunity to give students individual time with the teacher with less pressure.

The first part of the argument – about the thinking time - requires some stepping back. The most immediate counterargument would be that students can, or even should do, the thinking in their own time, outside of the lecture room: that is what "University independent learning" is all about. My point is that the in-session thinking time is not instead, but rather *in addition* to the individual thinking time: it also fosters the habit of critical thinking, questioning and discussion. In other words, for those students who are not accustomed to do so (thinking *is* different from rote learning, which is much too common in some schools), it fosters a good habit; it enables more interactions (of different types) from a more diverse group of learners. This does not need to be to the detriment of the volume of content presented in any given course: the time in the interactive lecture is "freed up" by the pre-recordings. Given that the material discussed is more complex, it is also only natural to give learners more processing time. Given that this material is also hopefully more interesting and more enabling of a debate, it is also more satisfying to deliver for a lecturer, particularly if the course is repeated multiple times. In a post-pandemic context (and where safe), increased interactions in the lecture room are also conducive to a more cohesive and collegiate/collegial environment.

While I hope that the arguments above are convincing in terms of large lecture rooms, little has been said specifically for relatively more quantitative subjects so far. I propose two additional points specific for

such subjects: (i) the teacher needs to give suitable time for processing and asking/answering questions - this is likely to be slower than in more discursive subjects; (ii) the problem sets / questions put to learners in the room need to be of suitable difficulty and time requirement; if a complex problem needs to be processed, an intermediate result may be either asked for or given, rather than the solution to the whole problem.

Suggestions and potential for evaluation

The prospect of "flipping" your classroom can be daunting but I suggest the way to progress is trial and error. In a very risk averse HE environment, I suggest a **small steps approach**. I suggest that one does not need to "fully" commit to a flipped approach, whereby most, if not all, simple core material is pre-recorded, and only complex topics discussed in the session. On the contrary, it may be useful to choose *one sub-topic* per lecture, where *some* simple content is pre-recorded, and an interesting case study discussed in the lecture. Such an approach presents the problem of lack of habit-formation for learners: however, offering a limited flipped approach in each or every other lecture may be sufficient, as long as students are warned in advance. The aim of such a 'small steps' approach is to gradually build confidence in both the lecturer delivering and the learners attending. Learners are likely to value (or at least not resent *en masse*) the approach; the lecturer will have the possibility of improvement in this technique from one year to the next.

Anecdotal evidence suggests that some students, notably those who appeared to be the most engaged, reported in an occasional email / conversation that they valued the opportunity to have more interaction in the lecture as a result of some material being pre-recorded; some of the international students mentioned that they appreciated the opportunity to familiarise themselves with the terminology from the pre-recordings before attending the lecture. However, these evaluations have to be taken cautiously, as there was no direct comparison for the same course with a more traditional approach for the same level: all students were subject to the same treatment. Unfortunately, no formal evaluation was asked from the cohort: a questionnaire and several focus groups with semi-structured interviews would be appropriate methods to evaluate the effectiveness of this approach (as illustrated by Nguyen, 2018). Another, and perhaps under-appreciated method of evaluation, would be peer-instructor observation of several sessions, to judge students' level of engagement and progress, but also to observe whether all learners are included and feel comfortable with the approach.

Limitations and mitigations

The first and main limitation of the FC approach (which has been pointed out by several colleagues in the Birmingham Business School Education 2022 conference) concerns learners who have failed to engage with pre-recorded material, due to time constraints, environmental/access constraints, lack of organisation, or "recordings fatigue". This is, undoubtedly, a very valid limitation of the proposed approach. It is, to some extent, mitigated by the fact that *some* content, and the most interesting part of it, is delivered during the interactive session, where the lecturer can show their passion for teaching and their subject and fully engage students. Thus, students who have not engaged previously should acquire

the motivation to engage with pre-recorded materials, both past and future ones. However, this mitigates only part of the issue; therefore, a careful selection of the material and formative / summative assessments as checkpoints and motivation should be used. Students who are "falling behind" are always a concern, just like those who are much more advanced than the rest of the group. One suggestion is to split the cohort according to the level of prior study and/or provide additional help or advanced/optional materials; both of these solutions require additional and significant resources.

The second important limitation concerns resources. Delivering a "flipped" or "semi-flipped" lecture requires more time and energy (at least in the first few years of teaching a particular subject) than a traditional lecture (as highlighted by, among many others, Tu & Liu, 2016). Additional thought and preparation are required for in-session discussions; pre-recorded materials and any interactive elements need to be prepared and updated. Even more importantly, the delivery of the session and interactions require more energy and passion from the lecturer (and any assistants) during the session: more things could go wrong, more cohort-management is needed, and simply more "walking about" the room and interacting with students is expected. In a very resource and energy constrained HE environment, these are important considerations.

Conclusion

Reflecting on my own experience on the choice of approach, I recognise how much of it was driven by practical considerations of what can go wrong, which is particularly daunting in a large cohort setting. Some decisions were shaped by either a cost/resource minimisation attitude (e.g. use of existing pre-recordings) or by strong risk-aversion (e.g. "flipping" only the relatively simpler elements and "flipping" only part of the syllabus). However, while practical considerations are very important, these are also anchored in sound pedagogical approach: from the decision to adopt all or part of the FC teaching to giving learners space to engage with their learning within the lecture room setting. These principles, combining practicalities to pedagogy, are both adaptable and scalable to other disciplines and levels of study, just like the FC approach itself is versatile & beneficial for all levels of learning (Strelan et al., 2020).

[2296 words excluding references & abstract]

References:

Brame, C. (2013). Flipping the classroom. *Vanderbilt University Center for Teaching*. Retrieved [30/09/22] from http://cft.vanderbilt.edu/guides-sub-pages/flipping-the-classroom/.

Dumont, A. (2014). Implementing the flipped classrooms and Peer Instruction in a Swiss University of Applied Sciences. *Western Switzerland: University of Applied Sciences and Arts*.

Harrison T. (2020) How distance education students perceive the impact of teaching videos on their learning, *Open Learning: The Journal of Open, Distance and e-Learning*, 35:3, 260-276

Lage M.J., Platt G.J., & Treglia M. (2000). Inverting the classroom: A gateway to creating an inclusive learning environment. *The Journal of Economic Education* 31: 30-43.

Little, C. (2015). The flipped classroom in further education: literature review and case study. *Research in post-compulsory education*, 20(3), 265-279.

Mazur, E. (2009). Farewell, lecture?. *Science*, 323(5910), 50-51.

Nguyen, T. (2018). Implementation of English flipped classrooms: Students' perceptions and teacher's reflection. *International Journal of Research Studies in Language Learning*, 7(3), 87-108.

Roehl, A., Reddy, S. L., & Shannon, G. J. (2013). The flipped classroom: An opportunity to engage millennial students through active learning strategies. *Journal of Family & Consumer Sciences*, 105(2), 44-49.

Rowley, N., & Green J. (2015). Just-in-time Teaching and Peer-Instruction in the Flipped Classroom to Enhance Student Learning. *Education in Practice.* 2(1), 14-17

Schell, J., & Mazur, E. (2015). Flipping the chemistry classroom with peer instruction. *Chemistry education: Best practices, opportunities and trends*, 319-344.

Strelan, P., Osborn, A., & Palmer, E. (2020). The flipped classroom: A meta-analysis of effects on student performance across disciplines and education levels. *Educational Research Review*, 30, 100314.

Towey, D. (2015). Lessons from a failed flipped classroom: The hacked computer science teacher. In *2015 IEEE International Conference on Teaching, Assessment, and Learning for Engineering* (TALE) (pp. 11-15). IEEE.

Tu, H. W., & Liu, Y. H. (2016). Understand the flipped classroom: A reflection. *International Journal of Arts & Sciences*, 9(2), 249.

Uzunboylu, H., & Karagozlu, D. (2015). Flipped classroom: A review of recent literature. *World Journal on Educational Technology: Current Issues*, 7(2), 142–147