

## A quick introduction to the flipped teaching method.

### Introduction

Essentially 'flipping' means that we turn (flip) Bloom's taxonomy (classification) of learning objectives [1] on its head so that the lower level learning objective such as acquiring information/knowledge are moved out of the timetabled slot<sup>1</sup> where they are traditionally covered, to *guided independent study*<sup>2</sup> and use the timetabled slot for higher learn objectives such as application and analysis, where it is normally much better to have help at hand (see figure 1). Whilst there is a certainly lot of discussion in the pedagogical literature about its merits and shortcomings, there is published evidence that a flipped approach will improve understanding and examination marks [2]. The traditional lecture format is around 1000 years old and necessary when printed information was extremely uncommon, i.e. the lecture was used to convey information which was not otherwise accessible. There is now essentially no barrier to access to information.

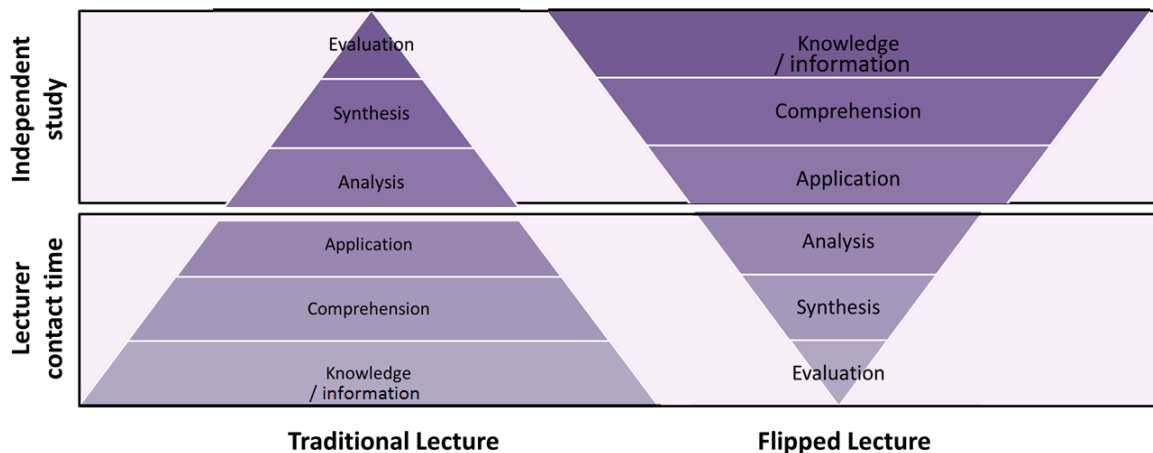


Figure 1: Bloom's taxonomy of learning objectives in pyramid form showing lower level learning objectives delivered in a traditional lecture format vs. higher level learning objective addressed during the contact time in a flipped lecture. Note that the pyramid representation of the taxonomy has recently been receiving significant criticism (in fact Bloom did not propose this representation) and the taxonomy has been revised recently. For those interested see David Krathwohl's [3] article: <https://www.depauw.edu/files/resources/krathwohl.pdf>.

<sup>1</sup>A generic term, normally meaning meaning a 'lecture'.

<sup>2</sup>The time you spend on independent learning. Note all modules have a proportion of guided independent study - in the case of 18MPB206, this is 72 hours! You can find the module specification here.

## What do I have to do?

In practice this means going to the Learn module page in advance of the timetabled slot and watching one or two short videos and reading accompanying material. The videos are generally less than 10 minutes long and the text material is normally one or two pages. The videos are designed to be bite-sized, self-explanatory and self-contained. The reading material expands on the content in the video and will help to give you a deeper understanding of the underlying concepts and principles introduced in the video. Along with this, there are sometimes a few review questions for each video in the form of a Learn quiz (generally multiple choice questions) to allow you to gain some feedback on your understanding.

The timetabled slot is used to work through examples of application and analysis of the material in the 'pre-watching' and pre-reading. This will usually be in the form of short problem questions along with in-class polling. This allows for 'peer-instruction' [4], which means you work through and collaborate and discuss the problems with a colleague or colleagues. The advantage of this approach is that it promotes active engagement in the subject allowing you to focus on the concepts and discuss them. The tutorial session then allow for much more in-depth and application and analysis to really hammer-home the concepts introduced previously.

## Independent study and asking questions

A quick note about *independent study* in general. Each 10 credit module specifies 100 hours of student effort<sup>3</sup>, which means around two thirds of your learning is done 'independently', i.e. outside any timetabled contact time. However, this does not mean you have to do it alone or without any help from friends, colleagues, the module lectures or your personal tutor etc. Lecturers are *genuinely* happy when asked questions as often if you don't understand something, it means others probably don't too and we can improve the explanation in the next lecture. I recommend asking questions in person rather than electronically wherever possible, as questions asked via (say) email can be ambiguous and/or may require an extended response which may be so much more effective to answer in person.

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<sup>3</sup>Assuming you do 60 credits in a semester, this means 600 hours of effort. Spread over 15 weeks this is an average of 40 hours per week of study.

## Summary

To give yourself the best chance of developing a good understanding the material as well as getting a good mark in the module, what you need to do is:

### **Before the timetabled slot:**

1. Put aside around 30 minutes to 1 hour in the week *before* the lecture to watch/read the learning materials in Learn. Plan in advance where and when you will do this around your other (academic/social/sport) commitments. It is not important when you do this, but leave enough time to do so.
2. Make your own notes based on the content of the video and the text material.
3. Attempt the questions associated with each block of learning material to self-assess your level of understanding.
4. Discuss this with your friends. Explaining something to someone is a very good way to ensure you understand it.

### **In the timetabled slot:**

1. Ask questions, discuss the problems with you fellow class mates and attempt the questions. You may want to initially attempt the questions on your own and then discuss your answer. You may need to occasionally quickly refer to the notes. This is fine, but there will not be time to watch and read everything for the first time.

### **After the timetabled slot:**

1. You may need to go back to the videos and clarify you thoughts and refine your notes. These notes will be invaluable for revision.
2. Attempt the questions again and if there are still points you do not understand make sure they are explained to you, either by your colleagues or the lecturer.

## References

- [1] Bloom, B., Englehart, M., Furst, E., Hill, W. & Krathwohl, D., *Taxonomy of educational objectives: The classification of educational goals. Handbook I: Cognitive domain*, Longmans, Green and Co. Ltd. London, 1956.
- [2] Weaver G.C. & Sturtevant, H.G., *Design, Implementation, and Evaluation of a Flipped Format General Chemistry Course*, J. Chem. Educ., 2015, 92, pp. 1437-1448
- [3] David R. Krathwohl, *A Revision of Bloom's Taxonomy: An Overview*, Theory Into Practice, 2002, 41:4, pp. 212-218
- [4] Mazur E., *Farewell, Lecture?*, Science, 2009, 323, pp. 50-51