LBL - learn before lecture, Moravec et al. 2010

Many teaching environments in the United States and abroad, are still very teacher-centered. To some degree, this has been changing due to a more student-centered model, mirroring the multiple shifting paradigms in the teaching landscape surrounding technology and creation of meaning as well as in the marketplace, where changes involving the democratization of production and of funding are the order of the day. I would leave this sentence out, it’s somewhat vague.

Teachers in many countries are aware of and interested in the concept of the flipped classroom and/or student-centered learning. When invited, I provide professional development for such professors focusing on these concepts. Professors have expressed concerns to me about whether their students will complete this type of assigned work before class and whether the student-centered methodology will be effective. Educators may also be reticent to try something vastly different because of the fact that they are lecturing in English, which is not their L1.

The following is a lesson plan for a professional development unit for L2 English speaking university professors from a multicultural university environment where the language of instruction is English. The background reading for the unit would be conducted in English as would the PD session and all assigned work for the professor-students.

Following Moravec, et al. (2010), actively engaging students in lecture has been shown to increase learning gains. In this study, the results demonstrated a statistically significant improvement in assessment scores when students were actively engaged in learning before attending lectures that focused on course material similar to that treated by their assignments. I would re-word this sentence, slightly confusing.

Course time: 09:00-10:50 daily Student:Instructor ratio 7:1
Day 1 - Introductions and initial discussion of flipped classroom concepts.

09:00 Syllabus/course plan overview
-A syllabus is a top-down, never bottom-up, process that nonetheless entails student involvement. The professor-students, by accepting the syllabus, are agreeing to a social contract whose domain is the classroom. Syllabi differ from university to university and from country to country, so there may be a good amount of material that the professor-
students are unfamiliar with. This will also be an opportunity for teachers to introduce themselves and each other to the class.

09:30 **Brief Introduction to student-centered learning**

- **Overview of Moravec, et al. (2010)** (teachers assigned to read before class)

**Abstract:** To create time for active learning without displacing content we used two strategies for introducing material before class in a large introductory biology course. Four to five slides from 2007/8 were removed from each of three lectures in 2009 and the information introduced in pre-class worksheets or narrated PowerPoint videos. In class, time created by shifting lecture material to learn before lecture (LBL) assignments was used to engage students in application of their new knowledge. Learning was evaluated by comparing student performance in 2009 versus 2007/8 on LBL-related question pairs, matched by level and format. The percentage of students who correctly answered five of six LBL-related exam questions was significantly higher ($p < 0.001$) in 2009 versus 2007/8. The mean increase in performance was 21% across the six LBL-related questions compared with <3% on all non-LBL exam questions. The worksheet and video LBL formats were equally effective based on a cross-over experimental design. These results demonstrate that LBLs combined with interactive exercises can be implemented incrementally and result in significant increases in learning gains in large introductory biology classes. Interesting!

Main points of the article:

There is a relevant increase in student scores on posttests when they are required to do LBL activities. Importantly, this work was done in a biology classroom, as all of the professors in this PD are science teachers. 80% of students in the study thought that LBL helped them learn the material. The LBL activities in Moravec's study included student completion of slideshow presentations initiated by the professor.

- **Overview of student-centered teaching practices in the programs in our IEP**

I have taught many spelling of these professors' students over the years and have been steadily moving toward an increasingly student-centric approach. We have a course entitled *Hot Topics in Science and Technology*, which is in essence a vocabulary acquisition class. In this class, students watch informational talks from TED.com and build their science-centric vocabulary through a bottom-up practice of co-creation of term definitions. Over the years this has proven effective to me in helping students to acquire and retain the meanings of complex words that are not easily analyzed without a reading knowledge of Latin and Greek, which very few people have in the 21st century.

Through the use of past students' work, including homework and performance on assessments, I will highlight the procedure of a distributed, student-centered epistemological process. Showing student work to the professors will give them an enhanced picture of both how their
students are performing in general and what tools they can experiment with to elicit such performance from them.

10:00 **Demonstration of past student work**  
  - Co-creation of vocabulary term definitions

For the Hot Topics course, I ask students to learn vocabulary terms before lecture. They are instructed to develop their own definitions of the terms using resources including dictionaries and the internet. A dictionary will provide a citation version of the term, whereas the corpus that an internet search returns provides the term in-use. In other words, dictionary definitions are assumed to be authoritative and unimpeachable by many, but constitute the most stilted and possibly least memorable definition of terms. Definitions extrapolated by observing them in use in a familiar forum may have a longer-term recall than the alienating, decontextualized definitions found in reference books.

Students in Hot Topics come to class armed with their definitions. They are picked at random to write them on the board, at about three students per term. The class then chooses the definition that they think fits the term best. This definition becomes the answer for the unit assessment. In this way, students, as co-creators of knowledge, are stewards of their own progress while pedagogy is still taking place within the traditional setting of classroom, teacher, and students. It is this methodology that I wish to pass on to the professors so they can employ it in their home university.

**Lesson**: show the teachers what the students do in the course and get them to provide definitions in their own words for a handful of them before revealing what the students came up with.

**-Students’ final projects**

In Hot Topics, students from different linguistic backgrounds are assigned a final presentation project to be completed as a group. They must select a video on the internet and from it create a lesson on the Ed.TED.com website. Their presentation explains the video and gives the participants in the audience the information they need to answer the questions in the presenters’ TED lessons. This is another way in which the students take ownership of their learning process. To guarantee that the student audience will participate, every member of the class who is not a part of the presentation group must complete the TED lesson created by the presenters, who in turn must write a short report on the other students’ responses.

For the professors’ PD, I will be encouraging them to make such requirements for their own students. Professors don’t need a lot of encouragement to prepare lectures as lecturing is par
for the course for them. However, professors from this particular university have indicated to me that they are either unfamiliar with or barely familiar with the flipped classroom.

**Lesson objective:** to show professor-students that this is a way in which their graduate students can have a demonstrable learning outcome and to detail the ways in which students have reached such outcomes in the recent past.

10:30 **Group assignment - final**

At this point the instructor will introduce the final task for the PD course: the group assignment to develop a syllabus incorporating student-centered teaching. Professors will be grouped by department or specialization and instructed to create a syllabus for a first-year graduate course incorporating flipped classroom methodology. On the final day of the course, each group will introduce their syllabus, describing where the course requires learn-before-lecture efforts on the part of the students.

**Lesson objective:** To introduce the final assignment and to reintroduce LBL.