Poster Presentation

Flipping the ESP Classroom

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Flipping the classroom is a recent trend in education that involves reversing the traditional instructional approach. In the traditional classroom, information is presented in class via teacher lectures, and practical application is done through homework. In the flipped classroom, information is presented through readings or videos that students study at home, and then the practical application is done in the classroom, in groups to facilitate peer instruction, and with concurrent feedback and assistance from the teacher. In this paper, we will show how this has been applied to an EFL writing course at the University of Tokyo, which is focused on the writing of scientific research papers. In particular, we will discuss the use of videos created to present material that would traditionally be explained in class by the teacher, and examples of the kinds of activities that can be done in class with time freed up by the use of the videos.

What Is Flipped Learning?

Over the last several years, flipping the classroom has become a trending topic in education discussions. While many teachers have heard the term, it is often not well understood, and its application to English language teaching has not yet been explored in depth (Başal, 2012; Zhang & Chen, 2014). In this paper, we will describe how flipped learning can be applied to an English for Specific Purposes (ESP) writing class, and how this can result in much more effective and efficient use of the limited class time available for teacher-student interaction.

The term *flipped classroom* (and later, *flipped learning*) was coined by high school chemistry teachers Jonathan Bergman and Aaron Sams (Bergmann &

Sams, 2012). In the traditional classroom, new material is presented to students in class through lectures by the teacher. Students then apply what they have learned in homework exercises done at home. In the flipped-learning approach, students first watch videos or read material covering the content of the lectures at home and then apply that material in exercises in class (Tucker, 2012). The 'flipping' is essentially that the lecture is done at home and the homework is done in class. The video or screencast format allows students to take in new material at their leisure and at their own pace. If there are parts of the material that they do not understand, they can clarify these points in the following class with the teacher or their classmates, or online, for example, through classroom forums.

Although the videos are the most visible and well-known aspect of flipped learning, the most important innovations are in the activities that can be done in the classroom with the time freed up by off-loading lectures to videos (Sams & Bergmann, 2013). This increases the time for face-to-face interaction between students and allows the teacher to provide individualized support to students while they attempt to apply the material covered by the videos to exercises that would traditionally be given as homework.

Flipped learning is most readily applicable to classes that contain large amounts of information that needs to be transmitted, such as high school or undergraduate science courses (Sams & Bergmann, 2013). Language courses, particularly in the communicative language teaching paradigm, tend to be more focused on practice and already incorporate active elements such as group work. However, in the case of second-language academic writing, there remain limitations that can be addressed through flipped learning. One is that students are unable to get assistance from the teacher during the actual writing, which is done at home. Another is that they may not understand the explanations of scientific writing conventions given by the teacher in class. Another very important limitation is that teacher feedback comes late in the process after the writing assignment has been completed by the student and often with no opportunity to immediately apply the feedback. The flipped learning approach can address these limitations by utilizing the limited class time for face-to-face student-student and teacher-student interactions more effectively.

Flipping a Scientific Writing Course

In the next section, we will demonstrate the application of flipped learning to a first-year academic writing course for science students, taught by the authors at the University of Tokyo. The objective of this course is to learn how to write scientific research papers in the typical IMRaD (Introduction, Method, Results, and Discussion) format, based on a small-scale experiment of their own design, which is conducted as homework during the first half of the semester. There are typically 15 students in one class, which is composed of weekly sessions of 90 minutes over one semester. As frequently occurs in Japan, most of the students have had six years of English study in secondary education, but they have never written anything in English beyond the length of a single sentence or paragraph, so the task of writing what tends to become a paper of about 8-14 pages, is quite daunting. To illustrate the nature of the differences between a more traditional approach and a flipped approach, we will contrast the examples of lessons on the writing of the Method section of a scientific research paper.

Traditional Teaching Approach

In the traditional approach, the teacher presents the material through lecture and teacher-centered discussion. For this topic, this includes the structure of the method section and the rules of academic writing which are relevant to this section—for example, the use of active and passive voice, the avoidance of first- and second-person pronouns. This is done through awareness-raising activities and analyses of examples from authentic research papers. At home, students write their own method section for their experiment. In the following class, students do peer review, followed by a rewrite of their draft for submission to the teacher. After the teacher reads and comments on the drafts, students receive feedback from the teacher and are able to use that to improve their writing, if they are so inclined, and if they understand the feedback.

Flipped Learning Approach

In the flipped learning approach, new material, which would have traditionally been presented by the teacher in class, is presented at home through materials

such as screeencasts, videos of lectures, or even readings (Bergmann & Sams, 2012). A short quiz is given either online or at the beginning of the following class to check comprehension of the video and to ensure that students watch it. In this particular example of learning to write the Method, the homework consists of two videos, one on the organization and content of the Method (Figure 1) and one on the language of the Method (Figure 2)—each under 10 minutes. Depending on teacher's lesson plan, each video may be assigned for a separate class or both may be assigned for the same class. In the following class, students apply what they have learned in the videos through activities leading to the collaborative writing of a Method section in groups based on a mock lab notebook page based on a Method section of a published research paper (Mickens & Wheeler, 2012; Figure 3). During this time, students can help each other with aspects of the videos that they did not fully understand, and ask the teacher questions as they come up. The teacher can observe the groups' efforts and correct problems and explain issues that arise. For example, one difficult aspect of the Method section for learners of English is the use of the passive voice. As they write the Method, they can discuss together whether to use passive

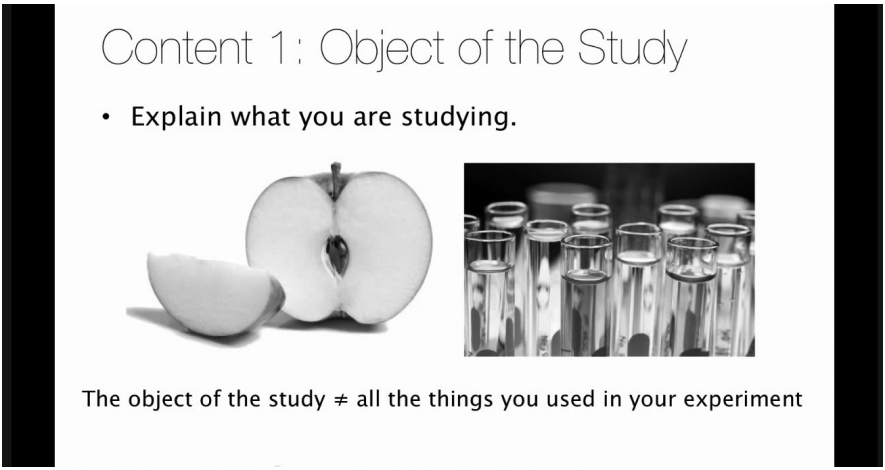

Figure 1. Screenshot from video "How to write the Method section, Part 1: Organization and content". Videos are posted online for students to access easily. The image shown is accompanied by verbal explanation by the instructor—in this case, explaining the content that comprises the first part of the Method section.

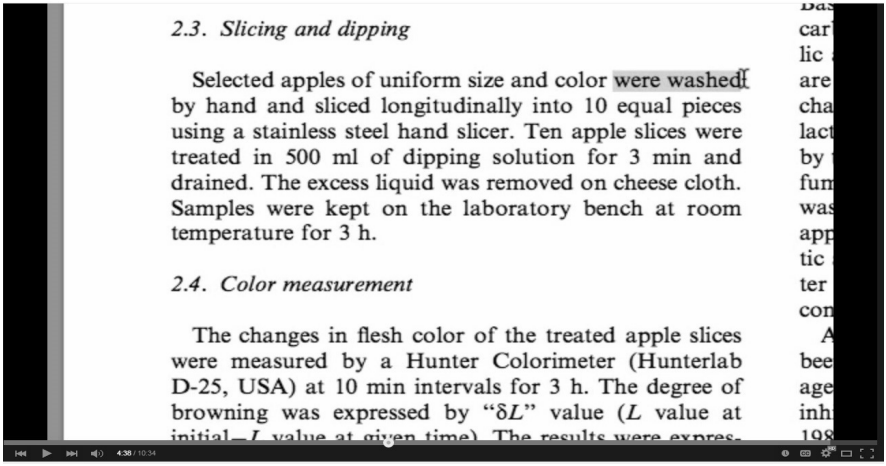

Figure 2. Screenshot from video "How to write the Method section, Part 2: Language and scientific writing style". In this particular section of the video, the instructor is explaining the use of passive voice with examples from a published research paper on the effects of different chemicals on the browning of apple slices (Son, Moon, & Lee, 2001). The particular construction being discussed is highlighted in the screencast while being explained in the audio.

or not in each case, and the teacher can look at what they have written and give immediate feedback.

After completing their collaborative Method section, they compare what they wrote with the published Method section that comes from the paper that inspired the lab notebook (in this case, Mickens & Wheeler, 2012) to guide them toward noticing gaps in their own production. After this class, students write a Method section for their own experiment alone at home as in the traditional approach, but it is the second Method that they have written, rather than the first.

In the following class, pairs of students review each other's writing for both content and the language points specific to the Method section, following a checklist provided by the teacher. After or during the review, they also talk with their partner about their paper. While this is going on, the teacher can talk to students individually about their writing, giving feedback and answering questions. This allows the feedback to be more interactive, where the teacher can discuss the feedback directly with the student, and focused on just those

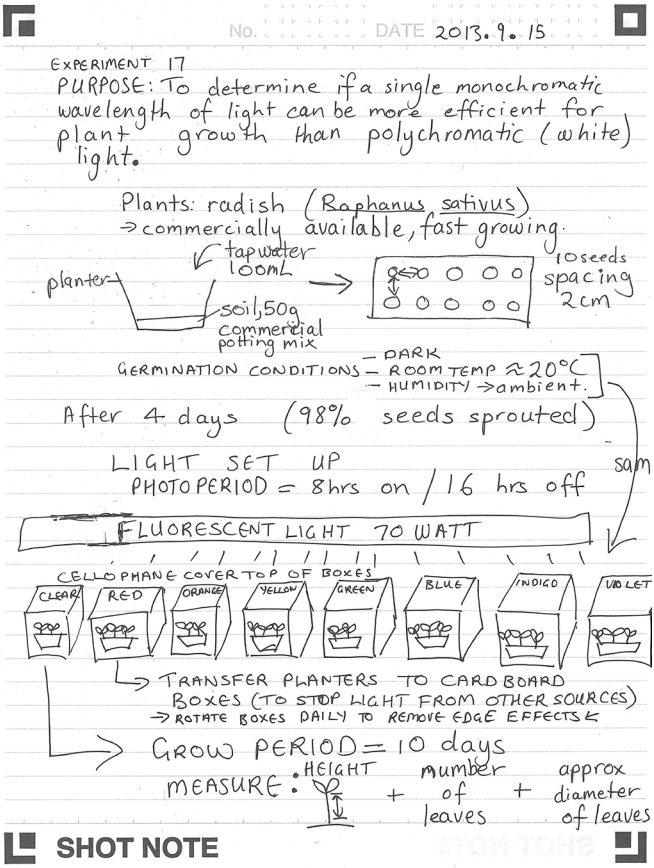

Figure 3. Sample lab notebook page describing the set-up for an experiment to be used by students to collaboratively write a practice method section of a research paper in class. Thanks to Jillian Healy for this activity and lab notebook page.

aspects that the students cannot resolve with peer assistance—something that is much more difficult for a teacher to do when giving only written feedback on writing outside of class. Overall, the flipped learning approach results in more efficient use of class time for more writing practice and for more timely, effective feedback.

Conclusions

The key point that must be emphasized is that although flipped learning is generally associated with the use of videos, it is what is done with class time,

rather than the videos themselves, that is the most important aspect of the approach. Even though the multimodal format may have advantages in terms of being less daunting and more entertaining than a reading assignment, the material could be presented just as well through readings or a combination of both. However, if the content of the video materials assigned as background homework is presented again in class, the classroom has not been flipped, and the limited time that the teacher has with the students has not been used most effectively and efficiently.

Of course, there are some disadvantages and challenges with this approach. A significant amount of time is needed to make the videos. Once videos are made, however, they can be reused, and after some time, a library of videos for a course can be created. This approach has been criticized in that it may lead to a kind of 'professional suicide' (Rees, 2015), where teachers are replaced by Massive Open Online Courses (MOOCs) using videos of their own lectures (Rees, 2015). However, this misses the most important point of the flipped learning approach: the teacher's feedback and assistance in the application done in the classroom is crucial and not trivial. It is this increased time for teacher-student interaction with the material, rather than one-way transmission of information, that is a core concept of the flipped learning approach.

In conclusion, flipping the ESP classroom can help to increase students' engagement in class activities, free up time for more application with teacher supervision, and provide the students with more timely and personalized feedback. We have noticed that the quality of students' papers have improved since the implementation of this approach, and particular problems that used to be very common have become rare. Taking the method section above as an example, students tend to overuse the first-person pronouns, rather than using the passive voice, making their writing sound more like a diary than a science paper. The flipped learning approach provides students with more time to digest the rules of passive usage, more practice with using them, and more exposure to examples in real research papers, which helps them to really assimilate this material and avoid this problem. It also minimizes the amount of time that students spend sitting and passively listening in classes, which is typically a large

proportion of a student's day (Strauss, 2014).

Although there is extensive empirical support for active learning pedagogical practices more generally (see Bonwell & Eison, 1991), flipped learning, as a relatively new methodology, has not been well investigated in the context of ESP writing. However, recent research with a pharmacy program has found that students' performance significantly improved with a flipped classroom over the traditional lecture method (Pierce & Fox, 2012). Also, Japanese students in an EFL setting found flipped classrooms to be a positive experience where they had more opportunities to communicate with the language (Mehring, 2015). Future research is needed to provide more empirical evidence to support the effectiveness of this approach. However, the potential for more practice and teacher-student interaction, and the more effective use of class time, would be a valuable addition to any class, not only ESP academic writing, and flipped learning has bright prospects for student outcomes.

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