

Using a blog to flip the classroom
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Abstract: Just in Time Teaching is a technique where students read the material before class and respond to a few questions via an online interface. The instructor will then develop the class for that material around the students' responses. In a first year seminar course, *The Chemistry of Food*, students were assigned to maintain blogs for the entire 16-day term. In order to create an online learning community, the instructor's blog in lieu of a quiz was utilized as a forum to assign the readings and pose questions about the readings. The comments on the instructor blog, as well as individual student posts, were utilized to develop the classroom discussion; moreover, many of the readings were not discussed in class but entirely online. Many students who would not normally participate in class were more than willing to participate online; thus, providing the class discussion with more variety and greater input from the students.

Learning how to learn is one of the most challenging tasks that students have throughout their college career, and yet, it is the essence of an education. While the knowledge learned in the classroom may not be retained past the 13-week semester, the process skills acquired will last a lifetime. In order to develop these process skills in students, my courses integrate Just in Time Teaching methods as first described by Mazur (1996). Utilizing Just in time teaching techniques, reading assignments are made prior to the next class meeting, and in a typical course, few reading questions are posed in a quiz format on the learning management software, Moodle (Mazur, 1996; Novak *et al.* 1999). In CentreTerm, a three-week intense intellectual experience, all first-year students at Centre College take a first-year seminar course. One of the courses offered in the chemistry program is *The Chemistry of Food*. In a previous rendition of the course, I utilized my typical Just in Time Teaching reading quizzes, but these were not as effective as in the 13-week term. While still employing similar pedagogical strategies, social media was an alternative to the typical method of interacting online with students (Higdon and Topaz, 2000). The most obvious choice was a blog. Having never written a blog before, it was important for me to model the product I wanted the students to create. However, the instructor's blog (<http://fys158.edublogs.org>) was utilized more for assignments, reading questions, and as a "home base" for the class blogs. In addition, other media and assignments typical of a flipped classroom were posted on the blog (Bergmann and Sams, 2012). For example, short video clips from YouTube and other sites were also assigned on the blog. Reading assignments for this course were made in one-week intervals. Reading was assigned both on a weekly assignment sheet and on the instructor's blog. Questions to focus a student's reading were sometimes posted on the blog or at the end of the previous class. Focus questions were utilized primarily in the beginning of the course, as the course progressed, within a few days for the 3-week term, I expected to students to be able to focus their own reading. The last question or after the first few days the only questions was always "what topics did you find the most confusing or interesting?" Students posted questions and interesting information in the comments section of the blog. Students, on occasion, answered the questions other students has posed.

The Chemistry of Food courses allows us to discuss a topic we are all familiar with—food. Therefore, students have opinions about a variety of the topics discussed: organic food, high fructose corn syrup, etc. A typical class would begin by projecting the instructor's blog with

student comments about what was the most confusing or interesting from the reading. We would then discuss the student concerns and interests. In other words, the student reading and understand (or lack thereof) guides the class discussion and learning for that lecture period. For example, one student commented, “A side note the in chapter of *Culinary Reactions* talked specifically about Hydrogen Bonding and referred to them as “weak.” If I remember correctly, last semester in chemistry we learned that hydrogen bonding was among the strongest of the intramolecular forces.” While only half of the students in the class took General Chemistry I at Centre College prior to taking The Chemistry of Food, this type of confusion is important to our discussion of molecules in food. Addressing confusion and misconceptions in class is an important aspect of the Just in Time Teaching learning environment. Since less time is spent defining terms and basic ideas, there is more time to discuss these important ideas. A first-year studies course lends itself to this type of pedagogy because content is a secondary goal of the course; however, in my more traditional courses, time could not be spent on addressing the misconceptions to any degree without Just in Time Teaching methods.

Another benefit of utilizing the blog as a Just in Time Teaching method that is typical of more traditional Just in Time Teaching methods is how quickly the rapport between the instructor and students is built. The additional benefit to utilizing the blogs is how quickly the individuals in the classroom became a learning community both in and out of the classroom. I attribute the lack of anonymity to one of these; many students were logged into the blog site when he or she posted a comment; therefore, it was attributed to that student. This type of personal education is necessary in a first-year studies course but often takes the entire term to create. In addition to developing skills typically seen in Just in Time Teaching, the student blogs chronicles a transformation that occurs in the course. This transformation was not only in the student’s view of the worlds, but also in the student’s ability to form an opinion with supporting evidence and post a well-written blog that was focused and informative.

Alternatively to viewing the blog comments at the beginning of class, students were assigned to answer questions at the beginning of class in a short 5-minutes writing, and then we used the answer to foster class discussion. The short in-class writing assignment countered one of the disadvantages of the blog comments. Because as described earlier, the blog posts were not anonymous, many of the more difficult concepts were not addressed in the comments. This allowed for me to communicate with the students that these are common misconceptions and difficult concepts. In addition, some of these assignments stemmed from their individual blog posts, which aided in fostering an online community. The development of this learning community is something that is almost impossible to create but essential to creating a successful learning environment for our students. If students can discuss concepts and material with each other, then oftentimes the classroom discussion is enriched.

While utilizing a blog for delivery of the reading questions was the initial goal of the project, the most beneficial part of the blogs was not this atypical delivery format for reading questions, but instead the discussion of the readings that happened on the students individual blogs. As eluded to previously, students maintained blogs for the entire term. Students wrote 16 blog posts and commented on their peers blog throughout the term. The grade was based on quality of the individuals posts as well as the quality and quantity of the comments posted to other student blogs. The students received assigned blog prompts at the beginning of each week;

at least five prompts were assigned per week. After about the first week, an online learning community developed which I also attribute to aiding in developing our classroom learning community. For example, students were posing questions and answering them on their individual blogs. Many of these students were writing well written and thoughtful comments about their opinions from the readings. Many of these discussions were so fruitful that the texts were not discussed during our class time. In class, I would often comment on students' blogs, but I did not comment on a individual student blog. I wanted to students to develop opinions and skepticism apart from my participation. The key to this rich online discussion was required students to make comments on their peer's pages. Therefore, it was not only the professor who was posing questions on the instructor's blog but also the individual student blogs fostering online discussion between their peers. In addition, the blogs are in the public domain, which is one of the high-impact practice associated with increased student learning gains. While I purposely did not comment on the student blogs, student parents and another professor did read and comment on a few of blogs, which increased the quality of the writing.

All of the blogs were hosted by edublogs.org and maintained throughout the semester. The student blogs were linked automatically to the instructor blogs. In a subsequent assignment in a different course, Wordpress was utilized for blog hosting. There are advantages and disadvantages to each service; however, the prevailing advantage to Wordpress is that it is free for the instructor to utilize as a class blog. However, the advantage to edublogs.org was that it utilized the WordPress algorithms and much of the initial set-up was pre-formatted. It also allowed the instructor to be able to solve any formatting problems in the student blogs as the student and the instructor have administrative access to the student blogs. A simple rubric developed by Mark Sample (2010) was utilized to grade the blogs. Students were reminded that even though the writing was in an online format, proper spelling, grammar, organization, etc. is necessary.

In short, the addition of blogs to *The Chemistry of Food* course had many more benefits than I first expected. Student writing gains and creating an online community were the most significant. While Just in Time Teaching is a preferred pedagogical approach as opposed to a tradition lecture, the method by which the instructor and student communicate has little effect on how the information is utilized. In short, I would recommend any type of Just in Time Teaching to an instructor of a variety of courses; however, blogs are specifically well fitted to a course that is writing intensive. They not only foster a learning community online and in the classroom, but blogs encourage students to produce a superior product.

Bibliography

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