Designing a Course as a New Instructor During a Pandemic

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I was hired as a tenure-track faculty member at the beginning of the pandemic. Though this was a new position, I was not new to the University or College – I had been a staff member for the previous 8 years. In many ways, this gave me a (false?) sense of comfort. I was working in the same department, in the same building, with the same coworkers. I just had a new title and new responsibilities. So, I thought I felt comfortable going into the Fall 2020 semester, even though it would be my first time teaching a full load. But even though we finished Spring 2020 remotely, I never thought it would extend into fall, and I would have to teach classes online.

Coming from a background in tutoring, I knew students learned best when they are engaged in doing the work themselves, with guidance from the instructor. Some faculty members in the Chemistry department have utilized a flipped classroom previously, with varying levels of student acceptance to this style of instruction. I had previously incorporated elements of active learning in the classroom, but I had no intention or plans to "flip" any of my courses. As the fall semester approached, it became clear that it would not be a normal fall semester; projections indicated COVID cases would rise in the fall, and I needed a contingency plan if students would have to miss classes because of illness or taking care of household members who fell ill. Or what would happen/how would I manage my courses if I or someone in my household became ill? With so many unknowns, I decided to do a version of a flipped classroom.

I recorded short PowerPoint-based videos that students could watch lecture videos on their own schedule. The recording of the videos was a new experience for me, particularly the logistics of sharing the PowerPoint slides and my written additions. Many of my first few videos took three or four attempts to get a video I was comfortable with sharing with my classes; there were false-starts, dogs barking, kids yelling, and general muddling of a description of a topic, all which meant hitting "delete" and starting the video over. The videos were available a few days before our class session, where we met synchronously to review that day's material and work on problem solving If a student was unable to attend a class or two, the materials were available to work through on their own. Working on the in-class material outside of class was not an optimal situation, and when possible, I wanted the students to be able to have the guidance and scaffolding provided by the synchronous sessions.

Another out-of-class work I asked of my students was completion of fill-in notes based on sections of the textbook. Material presented in science textbooks may be complex and difficult to understand upon first reading, and many are more focused on content delivery rather than

readability, so in my experience that means students are not comfortable reading them. I designed the fill-in notes with questions based on the text, with the questions following the order of the book, and students answering in their own words. The goal of the fill-in notes isn't complete comprehension of the material, but rather a low-stakes introduction to the material. I had used these type of fill-in notes before in another class, and they were well received by those students. With that knowledge, and because five points of completion credit were associated with turning in the notes, I expected the students to complete these.

Both watching of the video and the completion of the fill-in notes were to be completed prior to our class meeting, wherein we would apply the content covered. In practice, the students completed and submitted their fill-in notes before each class; the videos, however, were often watched only by a small subset of students prior to class. The goal of our class time was to "pull it all together" – to take the ideas read about and the concepts listened to and explore how we can apply those to meet our learning objectives. To achieve this goal, we would start with a brief review/overview of that day's material, then spend the bulk of the class period on in-class "worksheets", which were a series of application-based practice problems where the students utilized the content covered in the notes and videos. I would ask students to work on a problem, or part of a problem, then have them talk me through it as I wrote (I used an iPad and stylus, and wrote on the Word documents, so the students could see my work real-time) on a worksheet shared with the class. With small classes of about 20, it was fairly easy to work on these practice problems as a class in an online environment. Both audio and written answers, comments, and questions from the students during classes indicated the students were engaged and working on the practice material, and not simply waiting for me to show them how to do it. Chemistry is best learned actively – meaning the student, not the instructor, is doing the work. For this reason, I will likely use these worksheets as small group activities, or as part of "think, pair, share" activities in my future in-person classes.

One of the first things I think about when reflecting on my year teaching remotely is I learned how much I rely on the nonverbal cues from seeing my students. Not being able to see them (as most of my students left their cameras off during class) made it difficult for me to recognize if and where the students were comfortable with the material and ready to move on, or whether additional time was needed. Fortunately, many students were willing to add comments to the chat – sometimes that was just yes/no answer or a numeric value to a calculation, but even those brief comments were appreciated.

Feedback from my students indicated that they liked the way the class was set up, because, in their description, it essentially "taught" them a concept three times. The question now is, will I use this type of class in the future? The fill-in notes were extensively singled out by my students in their course evaluations as something that helped them learn, so I will keep these in my future courses. I also plan to use the in-class worksheets as small group activities when we are in an in-person setting. I'm concerned how much (or if) students will watch videos for class when we are "back to normal" and honestly, I'm not so sure they watched them in the first place,

particularly before class. My initial attempt at creating the videos were unfortunately a bit long for my liking - I would limit these to 10 – 15-minute videos in the future. In spring I gave random pop-quizzes for extra credit based specifically on the video material to encourage students to watch the videos prior to class. In the future, I would like to find other ways to encourage students to view the videos.

Conversion of Chem 1030 to a flipped online course taught me I couldn't simply have it ready by the time our class met – I needed to make sure the materials were available days before the day we would be covering the topic in class. And I learned that I could do it ("it" represents a lot here – teaching a full load, teaching online, and productively working from home, just to name a few things). I look forward to having students back in the classroom and to have the students work together in small groups, and to have interactions with students again, even if it is just facial expressions.