

Sometimes to Maximize Learning, Less is Actually More

Emily Nowicki

Curry College

Professors have the tendency to squeeze in as much content as possible into their courses, which stems from a difficulty in putting themselves in the shoes of their novice students and considering students' much more limited knowledge base. And for me with all my expertise, *everything* feels so important. So rather than trying to pick apart each topic, I keep adding more. I have seen firsthand that by packing my courses with too much information, students feel overwhelmed and confused. The student evaluations after my first semester as a full-time Biology professor reflected this. Many students commented that what I expected them to know or what I was trying to cover was "too much".

The challenge for me, however, has always been in the execution of this idea. HOW do I *effectively* distill the content while still teaching my students the necessary skills and information they need to be successful in the field? Despite course revisions after each iteration and countless trainings in Active Learning and Universal Design, I still sometimes find myself defaulting to rambling about overly specific details or adding another topic the next semester because the current version just didn't seem like it was "enough".

The complete shift to a Hyflex course modality during the COVID-19 pandemic forced me to heavily reflect on not only *what* was most important for my students to learn, but *how* they would engage with the material to learn it best, given the challenges we were faced with. I knew that due to the constant uncertainty as to how many students would show up in person any given day and the possibility of campus shutting down entirely for in-person learning, I had to flip my classes for my own peace of mind. Since there always seemed to be issues with remote students being able to clearly hear or see what was happening in the classroom, I needed a way to deliver the content in an engaging and high-quality way that allowed everyone to have a similar experience. I moved the majority of my course content to a video format integrated with our learning management system that enabled me to track views and even embed notes and questions into the pre-class videos. Class time was now spent working on projects, question sets, case studies, or activities (either in person or Zoom breakout rooms). Although I did everything within my control to optimize learning in the Hyflex modality, I observed that it was difficult for remote students to engage with both me and with other students, and even more difficult for students new to the college or without friends in the class to feel comfortable sharing ideas. On my end, having to check-in with students both in and out of the room meant constantly running back and forth from the computer to pop in and out of Zoom breakout rooms, conducting regular sound checks to make sure I could be heard clearly, and shifting to slide sharing in Zoom as

opposed to writing or drawing on the board so that all could see what was being discussed. Frankly it was exhausting—each day, I felt as though I was on a hamster wheel just trying to keep up with everything!

Interestingly, the biggest change to come from pandemic teaching actually had nothing to do with use of technology or flipping my classes. It turned out to be my more careful, deliberate consideration of the amount of content I tried to cover in each class. I quickly realized that if I was going to commit to lecturing as little as possible during class time, I needed to hone in on only the most essential information, and embrace the idea that students can research and explore more details themselves through class activities. It was important for me that pre-class “lecture” videos were not too long (20 minutes maximum) and kept as lighthearted and interesting as possible with lots of animations and illustrations. For many topics in my specific field of Microbiology, short and engaging videos covering important course topics simply do not exist. Therefore, I made my own videos highlighting exactly what I wanted my students to learn. Since I was also a new mother with no guarantee of when I would have time available to prepare for classes, I spent a large portion of my maternity leave in July and August 2020 preparing these videos and hired a nanny to care for my newborn son so that I could alleviate the anticipated extra workload during the semester.

Adapting my laboratory courses to fit our new social distancing requirements was another hurdle entirely. At my institution, labs during the pandemic were taught entirely in person with distancing measures in place. This meant that in order to spread out the required 6-foot distance, labs had to occur in two rooms at the same time, and students couldn’t work together in groups like they used to. Each student needed their own set of reagents and materials. The labs that had taken me years to develop and perfect had to be completely re-imagined. I approached this challenge by making a list of skills that are indispensable for students to learn and worked backwards from there. As with my lecture classes, I pared down the content of each lab session to only what was most important. Once I had this list, I then thought of how students could do each activity in the most interesting way possible, while keeping in mind our limitations (i.e. working individually, cost, set-up). I was still able to keep what to me are the most important aspects of the Microbiology lab such as teaching basic usage of microscopes, microbial staining, aseptic technique, and molecular biology techniques like PCR and DNA sequencing. I still included a semester-long research project in which students isolated and then characterized antibiotic properties of a bacterial specimen.

Some experiments that required lots of group work and materials in previous years made more sense to complete in a virtual format. Initially, I felt certain that my students would be getting “the short end of the stick” by performing a virtual experiment as opposed to the real thing. To my surprise, however, this was not the case. I learned that they could still be actively engaged. Without having to worry about completing all of the tasks in the actual experiment, we could pace ourselves, and I could clarify misconceptions as they arose. We had the time to talk through the concepts, experimental design, and data analysis together as a group. I realized that sometimes in a highly technical laboratory course, physically doing an entire experiment with

novice learners does not necessarily enhance their understanding of the concepts. Upon reflection, I noted that, in the past, students seemed to be just going through the motions and simply checking off all of the boxes in order to finish the experiment so they could leave. I had not provided adequate class time for reflection, critical thinking and discussion. My revised version of each lab allowed for just this—time to think it through together when I can be there to help them. And after all, this is exactly the point of active learning!

Even though the plan for the upcoming academic year is full in-person learning with no distancing, I am still modeling my courses after this past year's. I am keeping the videos and flipped classroom format in my lecture courses—not only did they help student learning and retention on assessments, but they were also well-received. While students will once again work in groups for the laboratory course, I have revised the course schedule to cut out unnecessary “doing without thinking” and allow extra time during each laboratory session for group discussion. Teaching during the COVID-19 pandemic has taught me that less can be more. I am better serving my students by giving them the opportunity and time to work through problems themselves and discuss together rather than cramming too much information or too many tasks into each class period.