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June 8, 2021

Teaching Reflection, Spring 2021

As we finish a third semester in the midst of a global pandemic, I am both relieved and exhausted. This semester was perhaps the most difficult for me in more than a decade of educating at the college level. The trials of hybrid teaching, increased plagiarism, waning student engagement and the constant threat of becoming infected with the virus were very difficult to bear. On top of this, I had to prepare three different classes (instead of the usual two) including a class that I not only never had to take as an undergrad, but have never taught before. My major finding is that teaching a course in a hybrid format is far worse than teaching it in a fully online structure, as it discourages both groups of students from participating in class discussion and splits my attention between the students in front of me and those on the computer.

I'll start with Precalculus. I taught this course in the previous semester, and after some tweaks I thought it went fairly well. However, this semester was a disappointment. Although I used nearly the exact same format, assignments, and exams as the previous semester (with slight alterations), I saw between a 15-20% drop on average in grades on exams. I'm not entirely sure what to attribute this to besides pandemic fatigue and lack of motivation for learning in a hybrid format. This is a very content-heavy course and there are a lot of things to remember, so if you aren't putting in a lot of work each week and staying engaged it's very easy to fall behind. In the end, I was forced to significantly curve exam grades, which I have never had to do in a precalculus class before. I can only predict that lower-level math classes will be more difficult for students who have had their education disrupted by the pandemic in subsequent semesters, so I believe I will need to fundamentally rework how this class is formatted when I teach it in the future. As for the CTEs, the scores were acceptable — I received an average median of 4.06 — but I would like to see the students perform better. On the plus side, I tried to mitigate plagiarism by addressing the issue in the first week of class and did not have to report any academic misconduct to the AGT for this class.

Next, I'll discuss my Proofs and Reasoning class. While I was interested to teach this class I was also hesitant. I never had to take the equivalent of this class. In my personal experience, proofs are best learned at the same time as novel mathematical material, while this class sort of takes the opposite tact and attempts to explain proofs with basic topics such as even/odd numbers and basic set theory at the level of essentially common sense. I learned to write proofs in the context of an abstract algebra and analysis course, and it came naturally, so it was difficult to put myself in the shoes of a person struggling with these concepts. I was warned, however, that the students would have a hard time with these straightforward topics and tried my best to accommodate them and make the process understandable. The main difficulty with teaching this class is that one essentially has to train the students to think and write logically, and if they aren't used to organizing their thoughts this way it can be very hard to show them how to do so. One of my main takeaways is that this course is essentially doomed to fail in a hybrid format. To be successful here, the students need to be engaged in class and ask questions when they become confused. With 2/3 of the class online and those in class not wanting to interrupt the live stream, very rarely did anyone ask any questions. This means that the class lecture becomes watching me write down a paragraph or so of technical language without any input from those attending remotely or in person, as no one is willing to speak up or ask questions.

I structured the proofs and reasoning class by having the students complete reading from the book and answer reading reflection questions. I am not sure how effective these were, as I frequently found that students were copying and pasting from the book to answer these questions rather than putting them in their own words. I also had some complaints that I was assigning too much reading. Really, the only way to learn to write proofs is to practice writing proofs, so I gave weekly homework assignments that regularly involved writing 3 or 4 mathematical proofs. I think students really struggled with these assignments, but very few would come to my virtual office hours. Virtual office hours also suffered from the inability to not be able to see their work, since it was handwritten. I gave detailed feedback on all of the homework assignments, but very seemed to look at my feedback and kept making the same mistakes or giving incomplete proofs repeatedly throughout the course. Most unfortunately, despite my attempts to mitigate academic misconduct at the start of the semester, I had at least seven students plagiarize their assignments so egregiously that I was forced to file reports to the AGT, and suspected that even more may have done the same. This means that more than 30% of the students taking this class attempted

to cheat their way through, which was very disheartening in a course that is supposed to be fundamental to developing mathematical minds. The course had three in-person midterm exams and a final exam, in which the scores were acceptable, with averages of an 83%, 73%, 73% and 70% respectively. I had been warned that the CTEs for this class would be generally lower than other classes, but with an overall average median of 3.39 this is probably the worst result on evaluations in my academic career. I think I can do better with this course in the future if it were in-person, but I will never voluntarily teach this course again in a remote or hybrid format.

Finally, I'll address my algebraic structures class. This class was small enough that I could have all of the students in person, except when someone was in quarantine. I implemented some new course materials this semester that I didn't or wasn't able to have in the previous two semesters. I edited my guided lecture notes and streamlined them. I was finally able to fully implement the Definition and Theorem vocabulary quizzes, and I think these helped to a certain extent, as I had less question about what certain terms meant than I had in previous semesters. Another new addition to my implementation was a "proof portfolio" in which students submitted typed proofs and I gave feedback and they resubmitted their proofs along with a reflection on the proof-writing process. I believe this was the most successful assessment throughout the semester and would like to transition to giving most or all of my assessments in this format in the future. However, for the majority of the assessments in this semester, I gave similar assignments as in the previous two semesters, but the students seemed to struggle with the material more. One again, virtual office hours suffer a lot in a class like this as I cannot see what the students are writing. I once again tried to mitigate plagiarism by having a class discussion early on, however I still had two out of my 15 students plagiarize their work from online sources and was forced to submit reports to the AGT. Overall, I think the students were not prepared for a mathematics course at this level with this amount of work. Since I had reduced the expectations a bit from earlier implementations of the course, I have to imagine that pandemic fatigue played a large role. Overall my CTE average median was 3.78 which is the lowest I have received on this particular course. I think I will be able to improve this course in the future by actually implementing group work in class, which was largely impossible due to social distancing. I also will mot definitely implement assessments that allow resubmission after receiving feedback so that the students can improve and reflect on their writing.