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January 10, 2020

Teaching Reflection, Fall 2019

I have taken some time to mull over the courses and their evaluations from my first semester teaching at SUNY Cortland in the Fall of 2019. There were some things that translated from my previous experiences efficiently, and some things that I need to alter and improve in the future.

First, I will discuss my two Linear Algebra sections. There were a lot of aspects in the class that worked here, and some unforeseen issues that can be adjusted for in the upcoming semester. It was my first time teaching the course, and the most advanced mathematics course I have taught to date. The students were largely motivated and sometimes enthusiastic to learn the material, and the evaluations results support that they were "effectively challenged" with a result of a 5 overall median. Students were very vocal about what they didn't understand, so something that worked well was being able to answer questions and pivot the lecture and reiterate important topics and results. The best days, and in my opinion, when the most learning occurred, were the days that I prepared a worksheet or practice problems to do in class, with the students working in small groups. Unfortunately, I did not get to implement these activities as much as I wanted to. The lectures I prepared simply took too much time, and writing large matrices for examples eats away precious minutes. I also had several students complain that I gave them "too many notes" and insist that their hands hurt from writing by the end of class. I have never encountered this before, and it was somewhat baffling as I was writing all of the same things at the board (the first hour in chalk, the second in marker). This attitude is reflected in the evaluations skewing lower in "effective style of presentation." I think I can help save time and hand endurance by preparing some sort of structured notes that students can follow along with and fill in the gaps during the lecture. This would also allow me to sprinkle in practice problems for the students to complete in class more easily. The conceptual topics covered in the course were more challenging than I had anticipated, particularly for those who had not yet taken our Proofs and Reasoning course. However, this prompted many people to come to my office hours and discuss these concepts,

which I feel was largely helpful. I think I will need to be a bit more patient and spend more class time on these topics next semester.

The combination of written and online homework went very well. As I had expected, many people excelled at the online homework but had problems with the written portion, particularly explaining more abstract components of the course. I had warned that I was a tough grader and expected polished work in the style of a lab report, and for the most part got what I expected. This did lead to some issues with plagiarism (at least 10 students copied answers from online sources at some point in the semester) but this seemed to stop once I addressed the class about academic misconduct.

Something I would like to improve next semester is the retention of the proper terms, rigorous definitions, and accurate statements of theorems. Students could perform the more procedural aspects of the course but didn't know the names of certain objects, or could not produce the definition of a fundamental term when prompted. I think I could combat this by requiring students to read the textbook in advance and emphasizing the importance of rigorous definitions and proper statement of theorems in mathematics by having some sort of weekly "vocabulary" style quiz. Success in mathematics is definitely not gained by rote memorization, but to discuss math rigorously one must have the definitions of fundamental objects close at hand.

The last subject I want to touch upon is the exams. While the class averages were largely acceptable, within the 68-78% range, very very few students were able to score above 90%, and the standard deviations were remarkably low. This further reinforced the gap between mastery of procedural and conceptual topics covered in the class, and I think this lead the evaluations reflecting a lower score with "[satisfaction] with my accomplishments in this course." I think the implementations above could help this, but perhaps the exams should focus a bit less on conceptual topics, or at least have questions that are more straightforward in this area. Overall I think the class was a success, and with guided notes, reinforced learning of terms, and more time spent for mastery of the abstract components, I believe it would be operating optimally.

Now for Calculus A, it's a bit more difficult to point out exactly what worked and didn't work here. I was surprised to find my evaluations below what I expected. I will focus first on tangible aspects of the course. First and foremost, the classroom only had a very small whiteboard to write on and in retrospect I should have tried to use the document cam instead —

a couple of students mentioned this in their evaluation comments and I think the lower numbers in "effective style of presentation" reflect this. Next, I overestimated the basic algebra skills of the students and the demographic of students that enroll in this course. I had assumed incorrectly that many students would be going on to take Calculus B, and would have a strong background in high school algebra but that did not seem the case. As such, many seemed largely disinterested in the course overall and several students made that clear in class. Also, many students had some poor habits that should have been corrected in previous math courses, (e.g, inability to properly simplify fractions, improper distribution and factoring, ignorance of exponent rules, etc.) and as such didn't fully meet the prerequisites to succeed in calculus. To combat this in such a class in the future, I should spend more time doing "step-by-step" style solutions and slowed down what I would consider basic arithmetic to a calculus student and point out common mistakes.

I structured the course in a way that has been successful for other lower level mathematics courses in the past. First a short 15 - 25 minute lecture presenting a new concept, followed by small groups getting practice on the material through practice problems, and a wrap-up at the end. Attendance wasn't great, but with the exception of one group, people would make it through most of the practice problems each day. Exam scores were exactly what I would have predicted with averages between 70 and 80 percent. Again, a combination of online homework and written homework seemed successful, however many students took great issue with the fact that I wanted them to treat the written homework seriously and not turn in quickly scribbled down scratch work. I treat the written homework as an assignment in any other class, so just because it is mathematics doesn't mean it shouldn't be polished, legible, and written in complete sentences where appropriate. I received a few comments to the tune of "this is a math class, why do we have to write?" which is a sentiment with which I strongly disagree.

I think the major issues in this class were not in the implementation as much as not garnering buy-in at the beginning of the course. Many people seemed to have bad attitudes about being there in the first place, and I should have done a better job at explaining my philosophy of learning at the outset. My evaluations contained several comments about my personal demeanor that, although I think are exaggerated, probably resulted from overestimation of their basic arithmetic skills. This, however, is in direct opposition to the result of a median of a 4.5 out of 5 in the question that addresses "[maintaining] rapport with this class". In this level

of course in the future, I need to be more patient when students ask about the material they theoretically should already know in order to not make some students feel inadequate. Overall, I think those that passed the course learned the material well, but didn't really have a particularly good time doing it. For a course like this, with students who likely don't consider themselves mathematically inclined, I need to do a better job of team-building and generating buy-in at the outset.

Overall, I am slightly disappointed in the results of the evaluations, particularly in Calculus A. While the scores are not abysmal and the overall average class medians were 3.83 for Calculus A and 4.22 and 4.33 for Linear Algebra out of a possible 5, they are lower than I have received on average in the past. The overall mean being .3-.4 points below the overall median in each class suggests that, though largely the majority of students were satisfied, those that were not had strong negative feelings about the courses. However, I am confident with some changes to implementation of the coursework in Linear Algebra that will greatly improve next semester. I am not teaching a lower level course next semester, but the next time I do, I intend to be more patient with the students, and not overestimate the arithmetic skills that I have relied to students to come in with in past courses and do my best not to alienate students that may need some extra attention. I also think a frank discussion of my teaching philosophy that mathematics should be discussed with others when learning, and then written down formally, legibly, and in complete sentences should occur at the beginning of the course.