The End of the Beginning

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The turmoil of the 2020-2021 academic year brought me back full-circle to the beginning of my craft as a Professor of Mathematics. My first tenure-track position was teaching and developing fully online asynchronous courses for adult learners at a state university. I learned a tremendous amount of online pedagogy on the job when I was there. I found it especially gratifying to develop and engage with students in asynchronous discussions on various topics in upper-level mathematics. I also enjoyed developing interesting final projects for the students to do in lieu of a traditional final exam. I enjoyed taking an interdisciplinary approach to learning, allowing students to explore and make connections. I enjoyed guiding students through a wilderness of knowledge, rather than lecturing at them in a traditional setting. My role in online teaching was mentoring students through the learning process and encouraging them to find connections between mathematics and other areas of their interest.

I loved the freedom online teaching afforded me to work on my own schedule, which is especially important for me as a person living with multiple disabilities. However, online teaching was not without its challenges: it was more work than teaching face-to-face, more challenging to explain complex ideas from a distance, and impossible to implement traditional testing. Sitting for hours hunched over a computer makes my chronic neck pain worse. I missed the interactions of seeing students face-to-face. I missed the simplicity of being able to hand students an assessment and to watch them working on it. How much more difficult it is to interject with helpful tips (or to catch cheating) when the students are doing their work remotely! I missed simply being able to walk around a classroom and get out of the chair at my desk.

After five years of developing innovative online math curricula, I made the difficult decision to leave that position before tenure and to start all over again. I spent another several years developing my craft as a face-to-face teacher. This was in some ways more challenging for me than learning to teach online. I began using mostly traditional methods, but that just didn't resonate with who I am or my experience teaching non-traditional learners online. I invested a lot of time and effort into learning and implementing innovative teaching strategies, such as IBL (Inquiry-Based Learning) or games-based learning.

Just when I was feeling more confident than ever in my abilities to teach in-person, we shut down. Just like that, we were all online.

Part of me wanted to shake my fist and curse Destiny, but the wiser part of me knew to be grateful for my experience and to do what it took to help the students. The shutdown was exactly what I needed at the time to continue to be there for my students, as I was very ill for three weeks with a nasty virus (I would have had to call out sick). Despite being sick, I made an emergency effort to convert the last half of my Spring 2020 semester courses into an asynchronous online modality.

The courses were already in an inquiry-based mode of learning, so that made the transition to a non-traditional asynchronous online modality easier. I created asynchronous discussion spaces to replace in-class discussions about the problems the students needed to solve. Students made their initial posts blind to what the other students had tried and posted. After sharing what they tried, students could view everybody else's work and discuss the ideas. They built knowledge as a community and wrote up their best solutions in a final portfolio.

Although the transition was abrupt, I managed to keep things rolling. I wanted my students in Fall 2020 to have the best possible experience, so I spent the summer attending numerous workshops and working on my course design. My Fall 2020 iteration of asynchronous online learning was much more robust and featured several learning activities and innovations that I will bring with me moving forward, regardless of the modality.

The most successful innovation--which I will include in all of my future courses—is the "Mistakes I Learned From…" blog. This is a course blog in the LMS, where students are required to share at least two learning mistakes during the semester. This is a concept I learned about in IBL workshops and tried several times to implement in face-to-face courses. Many students are afraid to speak up about a mistake in a classroom setting, yet I have observed none of the same trepidation in writing about mistakes in a blog post. I find the assignment very valuable in terms of encouraging metacognition and embracing the willingness to try.

The types of mistakes reported by the students are colorful and varied. Examples include: explaining technical details they originally overlooked, but were needed to solve challenging problems, conceptual revelations that grew from an original misunderstanding, and personal reflections on time-management or study habits. I find that the metacognitive processes of getting the students to think about their learning and learn about their thinking to be transformative and invaluable. Students who may struggle with organization or technical details find comradery with their peers in sharing with each other how they overcame challenges in the course and learned from their mistakes. The students are learning to see mistakes as a natural, healthy, necessary part of the learning process. They are learning not to be ashamed of themselves for not necessarily getting all the math completely right immediately and the first time. This process has been especially beautiful to see unfold in my Math for Elementary Educators class. The students who engage with these metacognitive activities show great potential for supporting their own students as they learn basic mathematics through experimentation and play.

I also included a "Final Reflections" blog in each course, which was inspired by a recent professional development workshop. Students close out the semester with a reflective blog post about their participation, what they learned, where they can improve, and what they will be taking with them as they move forward. This assignment is currently evolving into an Ungrading practice, where students reflect on their learning and suggest a grade for themselves. I find movement in this direction to be incredibly helpful in redirecting student focus from an obsession with grades to a curiosity and love of learning. My intention is to plant the seeds for lifelong learning and inquiry. My hope is that the lifelong-learning experience for the students is just beginning when they receive their grade in my class.

I will continue to use the asynchronous discussion spaces in my IBL courses as part of a flipped-classroom approach. In my experience, there is always a certain set of students that is very resistant to speaking up in class and sharing their work at the board. These are not always the struggling students; sometimes students with a lot to contribute are simply shy. In the asynchronous online format, it is much easier for the shy students to share their work and discuss it without standing in front of the class or speaking. I will continue to ask students to post their first attempts online to an asynchronous discussion space before meeting in class to explore the work further. I will prefer to take a hybrid approach in the future, where students may interact in whatever combination of in-person and online discussion that works best for them. Although this year has been challenging, I appreciate the opportunity it has given me to revisit my pedagogy in order to create robust and engaging courses for the students.

Indeed, the progression of two complete cycles--from teaching in-person, to fully online, back to in-person, and returning again to fully online-- has given me ample opportunity to reflect on the evolution of my pedagogical strategies over the course of my career as a whole. I love the creative process of designing robust, rich, self-directed online learning environments for the students. I also love being able to connect directly with my students, celebrate their successes, and help them overcome their challenges in person.

As the future looms with uncertainty, I will continuously strive to evolve in my approach to teaching. In the traditional setting, it is often too easy to slide into a path of least resistance involving traditional timed exams and perhaps a few too many lectures. I will make sure not to fall into this trap again, whenever I do have the opportunity to return to a classroom setting. Moreover, I am continuously striving to improve my courses in terms of helping students view the process of learning. My current focus is on helping students carefully write up their mathematical solutions, and to help them view writing mathematics as a valuable opportunity to think through complicated and challenging ideas.