

Educator's Mission

Preparation, dedication, reflection, and correction (PDRC) carry my mission to use academic privilege and mathematical expertise to support students—to connect groups to appropriate resources and planning, to establish people within professional networks, and to uplift a classroom in mathematical fortitude. In my vision to value each student, especially the “othered” of society, I consider the power of my actions and words to influence educational transformation through care-filled mathematics. That is, I work to engage students in their learning of mathematics in a way which emphasizes their personhood and makes space for them in the mathematical community (of our classroom and beyond). My students and I refer to this method as SHOWERing:

Speak
 Hear
 Observe
 Write
 Explain
 Read

mathematics in its challenging wonders and connective insights.

Student feedback 1: “Which attributes of the course and/or the professor helped you learn the material?”

I was able to learn new concepts through SHOWER, which I haven't heard of before this course.

I liked his SHOWER methodology (Speak linear algebra, hear linear algebra, observe linear algebra, write linear algebra,...). He also was a great help during his office hours.

Here I present experiences in traversing the axes of preparation wrapped in dedication and correction based on reflection, permitting my growth as an educator and making concrete the SHOWER method.

Preparation & Dedication

The first day of class is never the first day of teaching! My preparation is a culmination of my previous responsibilities and continued dedication to the craft of teaching. As an adjunct instructor with a 3:2 teaching assignment—my first time being an instructor of record—I called upon my tutoring experience to relate the daily lives of students in Intermediate Algebra and in Business Calculus with the algebraic manipulation emphasized in the topics of each course. This is how the SHOWER method kicks in! We spoke to the mathematics of our lives through dialogues in class on protecting ourselves from exploitative economics, linking the unit prices of products with solving equations of a single variable. Some classes featured pictures from my own shopping escapades that belied the consumer adage of bulk buying for total savings: A four-pack of lip balm was more expensive than four individual items of the same brand. Students explained how they understood the pricing matter and how either merchants or consumers would see the price difference.

Then I shared confessions of store employees stating that customers regularly paid more than the optimal amount since many shoppers tended not to display a use of their quantitative reasoning. I brought home that I expected my students to wield mathematical skills to combat financial and informational traps within our communities and throughout society at-large.

But none of the above would have mattered if I had not prepared to know my students. I studied my attendance rolls, paying attention to the listed majors, and made class time for them to introduce dreams, career plans, and curricula requirements. Many of my Intermediate Algebra students would later take statistics, so I displayed graphs from news reports to tie algebra to data presentation. What followed was a fruitful discussion on the the communicative importance of labeling axes, the convention to denote the direction of increase, and a non-example found in a news article showing an increase in fatalities using the downward direction.

During my PhD program, my first five semesters teaching were always in a new course. Preparation heavily involved researching past courses through online resources and learning from other instructors. And in dedication to welcoming students to my class, I began courses with an email assignment for the purposes of gauging digital access and learning about the community I was to guide. Each email told me about a mathematical hope, mathematical fear, and a goal for the semester. Students often dropped the mathematical part, but any response was information about the person I was teaching and interacting with.

Readiness through planning is not the only aspect of preparation. Operating with a sense of flexibility is key. What would I do if my Linear Algebra enrollment would double from 35 to 70 students? What would I do if the room limited the viewing perspective of students but contained several boards? Or how would I respond to a student wanting an example of a zero vector that is neither the number/constant zero nor a column of zeros? All these questions set the stage for my second time teaching Linear Algebra. I adapted tests and homework assignments so that I could grade with growth in mind; I highlighted key examples using small groups to personalize the learning experience; and, I brought non-book examples to the table for exploration using the ample board space.

Transforming learning spaces with an example: Given the odd geometry of the physical classroom, I was extra intentional in developing an environment for my Linear Algebra class to use board space. They were in overwhelming agreement to write out 35 sums (up to commutativity) on the power set of $\{\blacksquare, \blacktriangle, \bullet\}$ with symmetric difference as addition, leaving me to compute $\emptyset + \emptyset$. Then we formed a vector space over the field $\{0, 1\}$ by using an already-explored example of a set with associative binary operations. In this example and throughout the semester, definitions became more concrete through guided student explorations. It worked well for some students (especially individuals I knew would be adversely affected by an overload of stimuli) to contribute from their desks, while rotations provided opportunities for students to observe and explain to each other our collective results. Students explained that the empty set matched the description of the zero vector of a vector space. More generally, an introduction to finite vector spaces, not just finite-dimensional ones, gave background to applications of linear algebra in the design of algorithms, coding theory, scheduling, and encryption. My attention and dedication to my students, my research in algebraic structures, and my time preparing the example gave me the confidence to explore appropriately with a larger class.

Reflection & Correction

In line with preparation and dedication is the need for reflection and correction. As a postdoc, I signed a contract that did not have a teaching assignment. But to hone in on my skills in the classroom, I took on assignments outside the classroom. I led K-20 STEM educators in statewide and national webinars on equity, and as an active learner, I attended professional development sessions with K-12 teachers from across the country. I also took time to mentor undergraduates, postbacs, and graduate students through seminars and in research. All these accounts continue to provide reflective moments on teaching in the classroom. Even before my postdoc position, I engaged my limitations and re-considered the poorer evaluations of my teaching. Students

mentioned a need for more examples, and I found senior colleagues in mathematics and in mathematics education to evaluate my in-class teaching. I have learned to vet student feedback in order to improve the quantity and quality of examples as an instructor and researcher.

Student feedback 2: “Which attributes of the course and/or the professor helped you learn the material?”

<p>He makes sure everyone understands a topic and does his best to get everyone involved. Very passionate about math which makes class interesting.</p>	<p>Although at first a little skeptical, the teaching style used in this course did help me learn in this course. The use of examples in class helped immensely.</p>
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Now I use both my work in research mathematics and in mathematics education to refine the SHOWER method. My research on equity provides a deeper understanding of the needs of Black and Brown mathematics majors beyond my own story, particularly when intersecting math journeys with learning differences or the need for sustained mentoring. Being a researcher both in mathematics and in equity has forced me to speak, hear, observe, write, explain, and read even more!

All in all, I have taught undergraduates at an HBCU in the South, instructed undergraduates (and graduate students) at an HSI in the Southwest, led seminars in the Midwest for postbacs and graduate students, and engaged mathematicians and STEM educators around the globe. These relationships help me prepare in new ways, further my dedication, expose opportunities for reflection, and open me to correction for the sake of centering students.