Teaching Philosophy

Sayantani Bhattacharya

Abstract

My ultimate goal as an educator is to inspire students to appreciate mathematics not just as a practical tool but as a profound and interconnected discipline. So far in Auburn University, I have played the role of a Grader for Linear Differential Equations and Calculus I and an Instructor of Record for the MATH 1000 College Algebra class and I will build this essay mainly revolving around that experience. My teaching philosophy emphasizes inclusivity, engagement, and a deep appreciation for mathematics. Teaching mathematics is not only about equations and problem-solving, it is about building confidence, fostering curiosity, and inspiring a lifelong appreciation for learning.

Teaching Approach

Encouraging Mathematical Curiosity

Teaching College Algebra to freshman students is both a responsibility and a privilege. Most of my students come to class with minimal prior knowledge or confidence in math. My primary goal is to help them realize that learning math is not about innate ability but about persistence, practice, and understanding. In addition to covering course material, I often go beyond the textbook to explore deeper concepts and connections. For instance, in the chapter on complex numbers, I explain the necessity of $i^2 = -1$ and its implications for extending the number system. Similarly, while teaching linear equations, pointing out the equivalence of the different forms of straight lines or while doing linear inequality shuffling between less than and greater than symbols help students not just memorize but connect the strings by themselves. To further spark curiosity, I provide additional online resources, and pose thought-provoking questions outside the bookish material. My teaching is shaped by the methods and values I learned from my Indian educators, who emphasized clarity, patience, and a step-by-step approach to problem-solving. For instance, when teaching rational expressions problems or solving long linear equations, I break down those problems into smaller components, ensuring that each step builds on the last. This method not only prevents confusion but also mirrors the logical progression that mathematics embodies.

Creating an Inclusive Environment

Inclusivity is central to my teaching philosophy. Being prepared for every class is my top priority. I use own handmade notes, with carefully chosen examples, and timely updates to ensure that each session is well-structured and purposeful, besides encouraging them to study the CNAVAS videos and book beforehand. I always assume they are starting from square zero

and scaffold concepts step by step. In my classroom, students are encouraged to ask questions, share their ideas, and learn from one-another in a respectful and supportive setting. Group activities, such as collaborative problem-solving sessions, allow students to contribute their unique perspectives and build confidence in their abilities. I make it a point to accommodate individual needs, whether by providing extra time on homeworks, quizzes and tests for the students with permissions from the Office of Accessibility. Attendance is taken, but students are given grace for legitimate absences as long as they email me valid medical excuses, creating a balance between accountability and flexibility. Kindness and encouragement are central to my teaching philosophy. I don't punish classroom mistakes or late arrivals, rather I reward participation. If students need a break due to illness or other issues, they can leave the class without penalty. I frequently remind students about office hours and encourage them to reach out for help. My approach to communication is proactive: I send regular Canvas notifications, upload class notes, respond quickly to emails, and offer gentle reminders whenever necessary.

Strategies for Student Success

Interactive Learning and Engagement

Holding the attention of a class of 32 students, many of whom may feel disconnected from mathematics, requires creativity and energy. My classroom is equipped with a laptop, projector, and whiteboard, which helps me create a collaborative and welcoming atmosphere. Round tables encourage group work, and I prioritize active participation by involving students in discussions, often groups of 6, by giving them time to formulate answers by discussing within themselves. I leverage my dynamic speaking style and enthusiasm to create an engaging classroom atmosphere. Lectures are interactive, with frequent opportunities for students to participate, ask questions, and collaborate on problem-solving activities. For example, I use a chain-work approach, where one student solves the first step of a problem, and another continues it. This not only reinforces teamwork but also keeps students focused and actively involved. Additionally, I incorporate real-time feedback to ensure that students remain on track and understand each step of the process.

Revision and Iterative Learning

A key aspect of my teaching strategy is revisiting foundational concepts and integrating them into new material to reinforce learning and address common gaps in understanding. For instance, many students struggle with fractions, so I frequently incorporate fraction-based problems into various chapters, ensuring they practice and build confidence. Similarly, while teaching linear equations or rational expressions, I revisit concepts like GCD and LCM, emphasizing their practical applications. Factoring, being a recurring tool in algebra, is another skill I continually reinforce across different topics. Encouraging students to actively engage, I often have them solve problems on the board, help solidify their understanding and connect prior knowledge with new material.

Mistakes as Learning Opportunities

One of the most powerful aspects of learning mathematics is the opportunity to grow through mistakes as science is fundamentally based on trials and error. In my classroom, errors are

not stigmatized but are instead used as tools for deeper understanding. For example, when a student provides an incorrect solution, I guide them to identify the error and reflect on why it occurred. I may give them an innocent problem with clever mistake hidden in it and ask them to figure out the issues. This approach encourages critical thinking and reinforces the idea that mistakes are a natural and necessary part of the learning process. After each test, I conduct a session to address common errors and provide opportunities for students to improve their understanding.

Assessment and Feedback

My assessments prioritize conceptual understanding over rote memorization. My tests are concept-focused, while being sufficient to evaluate their procedural skills, rather than direct replications of their ALEKS homework assignments, encouraging students to truly grasp the material. I allow plenty space for partial credits in tests to appreciate every small effort. After each test, I analyze common mistakes and address them in class, providing students with a clear path to improvement. In addition to weekly ALEKS homework and quizzes, I conduct notebook checks after each test to encourage consistent practice.

Conclusion

Teaching Math 1000 College Algebra at Auburn University has been a transformative journey that has shaped my teaching philosophy and approach. I have transitioned from prioritizing strictness to fostering an inclusive, supportive, and engaging environment where students feel respected and encouraged to explore their potential. Looking ahead, I aim to further integrate innovative teaching strategies, such as flipped classrooms and gamified learning activities, to make math even more engaging. My long-term goal is to align my teaching practices with Auburn University's mission of fostering critical thinking and lifelong learning.