Teaching Philosophy

Ángel Chávez

My duties and responsibilites as a teacher of mathematics are best captured by the following two fundamental beliefs:

1. *Student engagement is the best avenue for obtaining high-level understanding. Therefore, I must do whatever I can to encourage student engagement.*

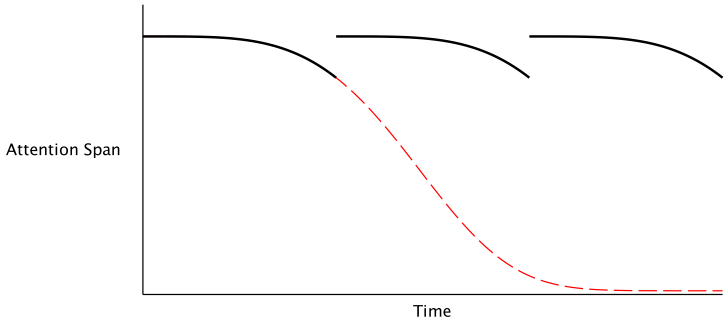
2. *I must be patient and I must be encouraging to each one of my students in order to stimulate positive and insightful communication with them.*

Student Engagement: How I Teach in the Classroom Setting

I begin every class with a review and a list of the day's learning objectives. A short and concise review at the beginning of class reactivates prior learning. A list of learning objectives provides the class with structure and facilitates the integration of new information. Reviewing and planning ahead both serve the underlying purpose of *gaining attention*. Gaining the attention of the class is essential because it prepares students for active classroom learning. Below is an example (which would be written on the whiteboard and left up for an entire class period).

Review	Differentiation satisfies $\frac{d}{dx}\big(cf(x)\big) = cf'(x)$ and $\frac{d}{dx}\big(f(x) \pm g(x)\big) = f'(x) \pm g'(x)$
Objectives	1. Learn a shortcut to compute the derivative of $f(x) = x^p$ (the *Power Rule*). 2. Develop efficiency in using the power rule. 3. Explore how the power rule is used to find the vertex of a parabola.

Research has determined that the average adult typically processes a given task for 10-20 minutes before losing focus (Sousa, 2006, pp. 45-47). I keep this in mind every time I prepare for class, reminding myself to implement multiple modes of instruction (such as traditional lecturing, worksheets and audiovisual presentations). Multiple modes of instruction enhance retention, and they allow us to circumvent the issues we encounter with limited attention span. For example, I could lecture just to the point when students begin to lose focus, and then switch to a new mode of instruction in order to *maintain attention*.



Incorporating multiple modes of instruction promotes engagement because of its effectiveness at maintaining high levels of attention. And a classroom full of attentive students who see their teacher's enthusiasm will naturally engage with the material being presented; they discuss and communicate not only with their teacher, but also with one another. This type of engagement is what leads to the high-level understanding I aim for.

Interaction with Individual Students

When it comes to my one-on-one interaction with students, I must be ever mindful that each one of them is at a different stage of mathematical maturity. As a teacher, I will never allow myself to forget this. Therefore, I always make the conscious decision to be the patient and uplifting teacher that I truly am. Whether it be through email or during office hours, I want my students to feel welcome and comfortable asking for my help. This increases the quality of my communication with students and increases my awareness of how they learn and grow throughout the course of a semester. Moreover, effective communication provides me with insight as to how my students are thinking about mathematics. And this enables me to better accommodate their needs as learners. In summary, each of my students, as individuals, can expect the following:

1. My accessibility and availibility outside of class.

2. My accommodation to their needs as learners, no matter their stage of mathematical development.

A Brief Summary of Teaching Experience

An instructor has full responsibility of a class, including holding lectures, assigning and grading homework, writing and grading exams, and holding office hours. I was (will be) an instructor for:

- MATH 129-Calculus II (Spring 2015)
- MATH 122B-Calculus I (Spring 2014, Fall 2014)
- MATH 113-Elements of Calculus (Summer II 2013)
- MATH 120R-Pre-Calculus (Spring 2012, Summer I 2012, Fall 2012, Spring 2013)
- MATH 112-College Algebra Concepts and Applications (Fall 2011)
- MATH 111-Plane Trigonometry (Spring 2009, Fall 2010, Spring 2010)

In the Super TA program a graduate student is paired with a professor of an upper-division course in order to assist them with the course. I was a Super TA for:

- MATH 323-Formal Mathematical Reasoning and Writing (Fall 2014)
  Duties: Holding office hours, grading homeworks and on occasion, holding lecture
  Instructor: Dr. Cody Patterson

A Brief Summary of Teaching Interests

My primary teaching interests lie in the areas of teacher development and teaching with technology.

Middle school and high school teacher development has very recently become an interest of mine. I ran a workshop on basic graph theory for middle school mathematics teachers through the Math Teachers' Circle, which is held in the Institute for Mathematics and Education at the University of Arizona. I could never have anticipated the sense of reward that running the workshop would give me, and I am very excited to continue working on teacher development in the future.

I am also interested in the integration of technology in my instruction. I have recently employed the use of a recording and screen casting software called *Panopto* (an example is avaliable by request). I have mostly used this as a resource for reviewing material before an exam. I have also implemented the use of interactive visuals (through *padlet.com*) for making study guides (an example is available by request). My primary interest is to find other ways to incorporate these two technologies into my instruction. I am also interested in experimenting with the use of classroom response systems (*clickers*) in the future. I believe these can be very powerful tools for assessing our students' understanding of key concepts. This technology is used extensively in undergraduate physics programs throughout the country. It should be used more in mathematics.

References

[1] D. Sousa, *How the Brain Learns*, Thousand Oaks, CA. Corwinn Press (2006).