

TEACHING PHILOSOPHY STATEMENT

PEDRO FERNANDO MORALES-ALMAZÁN, PHD

Mathematics has always been classified as a tough and unattractive study topic. Many young students begin college with the idea that mathematics is a hard subject and that it mainly deals with numbers and equations. One of my teaching goals is to show my students that mathematics is not simply restricted to the study of numbers and equations. Rather, mathematics is a language through which one can precisely describe real life phenomena. Additionally, mathematics constitutes a broad area of study in and of itself.

I believe that an indispensable concept in the study of mathematics is to be able to have different points of view, as making connections between these different views is of great importance for problem solving and critical thinking. These two are key components in an effective mathematical education that goes beyond mechanical skills and memorization. My methodology involves the develop of these and other critical abilities by focusing on the students' context. This context encompasses both their academic and their cultural background. One helps define the depth of the class material, while the other focuses on its delivery.

By using experiential learning and inquiry-based learning, I explore different ways to achieve student engagement and develop their thinking and mathematical skills.

METHODOLOGY

One of the biggest challenges of modern education is to connect with the student in a meaningful and effective way. This has mainly to do with two important questions: *what* and *how*.

The question regarding *what* has to do with the content that we intend to cover, and how wide and deep we intend to explore the subject mater. This requires a good assessment of the background that the student population has, its needs, and their expectations from the material. This inclusivity considers students' past, present, and future in order to better incorporate the material into the their profile. In this way, it is the material that gets adjusted to the students, and not the other way around. Considering this, the students see the personal relevance of the study subject, and their motivation and engagement improve. It is also important to contemplate these key aspects not only in a global class level, but also in an individual student level. That is, different students might have different academic backgrounds and it is very important to meet them were they are. I have found that using inquiry-based learning techniques for this purposes is a great tool in both meeting students at different levels and challenging them at different difficulties.

On the other hand, *how* deals with the delivery method best suited for an audience. This has to do with an appropriate context that enables students to connect with the material and to better understand the relevance of it. Here, the idea is to approach students from their cultural point of view. By considering this, it is possible to guide the goals and the methodology in class in such a way that students can see the relevance of the topics and that they can connect in a more efficient way to the content. The use of technology, real-life examples and experiential learning are a very effective ways to apply this methodology. By doing this I have discovered that students' engagement improves and their approach to their learning experience gets transformed.

The ideas of Experiential Learning and Inquiry-Based Learning are well suited with inclusivity in the classroom and placing the learning experience centered on the student rather than on the professor. Promoting student inquiry enables a more effective way to assess student engagement and learning, as well as to promote critical and effective thinking in the classroom.

The teaching and learning methodology can be used not only to develop mathematical skills, but also to cultivate learning and thinking habits in students. On top of the mathematical abilities proper to the course, using a more inclusive approach through inquiry-based and experiential learning makes students to

develop general learning, social, and thinking skills. Some of these are the ability to work in groups, to face challenges and failure, to question themselves and their resources, to correctly present an idea or argument, and to explore the reach of a problem or result, among others.

I find great advantages of using blended teaching methodologies. I think that these give the advantage of having a more personal experience with the students and enables the instructor to share problem solving and learning experiences. These blended methodologies provide a way for teachers to make a deeper impact on the learning process and to connect more with the students.

COMPUTATIONAL AND EDUCATIONAL RESOURCES

I believe that using technology is essential for mathematical education. I have experience using applications like Wolfram Alpha, Mathematica, Geogebra, R, among others, for in-class activities and group projects. The use of these tools can redirect the focus to the underlying mathematical theory and make the students realize that computation can be left to a secondary role. Also, with the help of computational software, it is possible to achieve more realistic descriptions, to obtain better images, calculations, and approximations of the described phenomena.

Online educational tools are fundamental for improving the educational experience. From communication to class videos and online assignments, these tools can greatly enlarge the capabilities of a teacher and the success of the learning process. I have used great tools like Piazza, Blackboard, Canvas, Quest, and MyMathLab that improve class management, communication with students, and enhance assignment assessment.

MENTORING

Another way of motivating development in mathematics is made by mathematical challenges. Mathematics finds motivations in real life problems by developing tools for other sciences, but also mathematics is a rich area of study in itself. I believe that mathematical olympiads share the same spirit as many areas of pure mathematics, being made just for the sake of mathematics development. For these reasons, I find mathematical competitions and math circles to be really motivating for developing mathematics, even more at young ages. This can be a good way to engage undergraduate and graduate students into mathematical research. I have been part of the training team for several international mathematical competitions in my home country, and I have seen how motivating it can be for developing skills as a mathematician, being myself attracted to mathematics in the first place when participating in such competitions.

ASSESSMENT

A very important component of the teaching process is to assess the difference between what is being expressed to the students and what is being perceived by them. This is one of the key aspects of a teacher, as it is possible to readjust the content delivery in order to more effectively reach the student.

Nowadays, the teacher has a more interactive role, as the facilitator and enabler of knowledge, more than a mere content deliverer. Effectively assessing the students perception is crucial to improve the learning experience.

Assessment can be made not only through evaluation, but also constantly while interacting with students. This provides a way to adjust both the content difficulty and the delivery method in order to effectively meet the student context. Actively pursuing this assessment makes both the teaching and learning experiences more lively and dynamic.

As my faculty evaluations show, students feel comfortable asking questions and reviewing material, not only in class, but also during office hours and review sessions. Having above average results in the faculty evaluations tells me that my teaching philosophy and aptitude towards students is in a good direction.

DEPARTMENT OF MATHEMATICS, THE UNIVERSITY OF TEXAS AT AUSTIN, 2515 SPEEDWAY, AUSTIN, TX 78712
E-mail address: pmorales@math.utexas.edu