

Statement of Teaching Philosophy

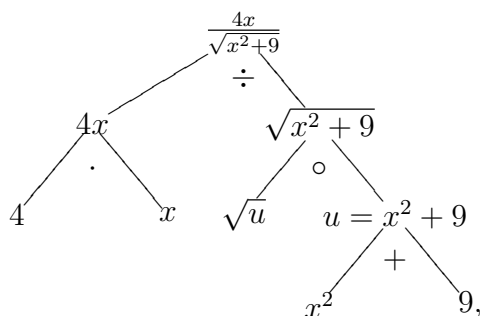
James B. Wilson

In the classroom I believe math should be enlightening and applicable. To get the most out of my students, I encourage them to make use of office hours and I run an interactive classroom. Calling students by name is a simple way to let them know I notice them and care about their learning.

As I teach mathematics I address three critical questions: why is the concept needed, what does the concept mean formally and intuitively, and how can it be used?

For instance, to help a student reach beyond that familiar “vertical-line-test” description of a function, I might challenge him/her to explain why, or why not, $f(a/b) = a+b$ is a function. A student can easily experiment with such examples and uncover faulty assumptions. This prepares the student to accept a new perspective, definition, or theory.

To make use of the new concepts, students should also be equipped with useful tools and scenarios to apply their knowledge. Continuing with the example of functions, to prove that that $g(x) = \frac{4x}{\sqrt{x^2+9}}$ is a function I have the student first factor the expression:



and then I help him/her explore how complex functions can be built out of simpler components using common operations.

I intentionally introduce examples that hint at future settings. In a future lesson, this decomposition helps a student visually organize the many steps involved in computing the derivative of $g(x)$.

Over the past six years I have authored hundreds of pages of lectures on undergraduate math classes, a similar quantity of solutions sets to graduate level algebra problems, and over 90 articles on various mathematical topics through an educational website.¹ These represent techniques I have uncovered to help students understand concepts behind computational problems. I believe these are effective tools because they worked in my own education and I see the effect with my students. Indeed, I receive weekly e-mails from around the world, asking for help with problems, further solutions and articles, etc. How to use new technology and on-line learning is still under scrutiny, but I feel it is important to practice with early prototypes so that we are equipped to respond to future needs of our schools, universities, and employers. I have already experienced this shift in my current institution, which has recently adopted an on-line homework system.

As I continue to teach, I encounter and absorb a steady flow of new ideas such as these. This is my opportunity to learn with my students. Each term brings new students, and I look forward to their insights and problems.

¹Visit: <http://www.uoregon.edu/~jwilson7/> and PlanetMath.org.