Teaching Statement

Robert Schweller
Department of Electrical Engineering and Computer Science
Northwestern University, Evanston, IL 60208, USA.
Email: schwellerr@cs.northwestern.edu
http://www.cs.northwestern.edu/~schwellerr/JobMaterial.html

My teaching philosophy consists of many different ideas that stem from my experience as a student, teacher, and researcher. It is best summed up by a quote from the Irish poet Yeats, “Education is not the filling of a pail, but the lighting of a fire.” I use a variety of means to motivate my students but in this statement I will focus on a single powerful method - that of providing entertainment in the classroom. I have chosen this idea because I feel it is important yet underappreciated by many educators. A description of this aspect of my teaching philosophy along with some of my experiences is described below.

As a fundamental aspect of a teaching philosophy, providing entertainment in the classroom may seem a little odd. But I think a teacher who is able to effectively land an occasional joke or tell an interesting story wields a powerful tool with great potential to enhance the classroom experience. One benefit of an entertaining teacher is the ability to keep students awake and paying attention. As a former college student, I know first hand that they don’t get much sleep. And, as a result, a few well placed jokes may make the difference between another one hour nap and academic enlightenment. But beyond this, entertainment can have a significant impact in two ways: It can aid in the retention of course material and it can help alleviate some of the unapproachable aspects of Computer Science.

**Improved Retention**

I believe entertainment in the classroom can substantially aid in improving retention of information in the classroom. The occasional incorporation of an interesting side story during a lecture can often change a technical concept from just another item in a laundry list of dry information into a concept that sticks out and is retained well beyond the extent of the course. The following is an example of a situation that occurred during a lecture I gave to a Mathematical Foundations of Computer Science class. In this lecture I was introducing the concept of recursion and was using the Towers of Hanoi problem as an introductory example. Rather than simply introduce the abstract formulation of the problem, followed by the recursive solution, I opted to give a little history/legend behind the problem, as well as it’s inclusion in works of science fiction.

This approach was a success. First, it got students’ attention. Instead of passively listening to the lecture, I began getting feedback in the form of nods, laughs, snide comments (these can be good…). But more importantly, I believe that by associating recursion and analysis of recursive functions to an interesting and relevant story, the
students achieved better retention of the points in the lecture. For example, when students think about my recursion lecture, I hope they ask themselves “Now why would it take so long for the priests of the Hanoi temple to finish the puzzle?” And from this they may recall the recursive nature of the solution and the principles behind analyzing the corresponding run time.

**Alleviating Computer Science Anxiety**

The other benefit from entertainment is that it can help humanize the teacher and make a very technical and potentially foreboding subject, such as computer science, much more approachable for students. From my experience in Computer Science, I’ve found there are many unfair stereotypes associated with the typical Computer Scientist. These stereotypes portray the Computer Scientist as a male with few interests beyond programming, hacking, pizza, and computer games. I think this stereotype can be detrimental by making the field less approachable to many bright students. Such students may turn away due to a lack of interest in joining such a culture, or by the anxiety of feeling like an outsider in a Computer Science class.

As an instructor I try to draw from my experiences to challenge these stereotypes and alleviate this anxiety. I’ve found that an effective technique is to annex standard lecture materials with interesting side stories and jokes. First, such stories create a more relaxed environment in the classroom which inherently reduces anxiety. Second, a story or a joke can help to relate to students of varying backgrounds. A good side story can show that the instructor, and computer scientists in general, have interests in things like history, popular culture, music, etc. For example, the Towers of Hanoi story is an excellent opportunity to convey interests in history, religion, and science fiction. In other lectures, I have taken advantage of the many eclectic applications of computer science concepts (such as dynamic programming applied to musical database queries, fast fourier transforms applied to nano-technology, network flow problems applied to road construction) to convey interests in music, sports, culture, etc. Displaying these interests helps remove harmful stereotypes and makes Computer Science culture more approachable.