A brief consideration of the correlation of pre- and post-testing as an indicator of student success in geology classes

Joanna Scheffler, Adjunct faculty in geology, Mesa Community College

In the last two years my classes have been part of the GARNET (Geoscience Affective Research Network) project, with which some of the participants in this SAGE workshop are familiar. In this project, students were asked to fill out an MSLQ (Motivated Strategies for Learning Questionnaire) at the beginning and toward the end of the semesters. In addition, the students took a pre-test and post-test of general concept geologic questions. I am by no means a statistician, but MSLQ surveys have not shown much movement between the first and second runs. I had hoped the general concepts pre/post –tests would show big differences, particularly since many students missed half or more of the questions in the pre-test. With few exceptions scores did improve in post-tests, but not as much as I had hoped. This held true in the second year (2012-2013 academic year) of the study, even though I have been addressing some learning strategies directly in my classes. Primarily I have asked my students to reflect on what their goals are for the class and how they intend to achieve those, followed by later assessments of where they stand on those goals. I have discovered that even for this low stakes concepts assessment I have to resist "teaching to the test". I have also been working on making my lecture classes more inquiry-based and less lecture-based.

I believe that the numbers from the GARNET work are not the only standard of student success in my classes, although much of my basis for this is anecdotal. For instance, I have a reasonably high retention rate (80+% by my informal calculations; I have found a few statistics of retention in the geosciences at individual schools but not for two-year schools in general) of students who finish the class. Students tell me "they always look at rocks now when they go for walks or trips" or "this class made rocks interesting and I didn't think it would" (quotes mine). Very few of my students say at the beginning of the term they plan on majoring in geosciences, but occasionally one will tell me they've decided to switch to geosciences. These outcomes are not so easily quantified.

My strategies for achieving student success in my geology classes are tempered by the fact that my formal background is strictly geologic and my teaching is experience based. I am only cursorily familiar with many education concepts (for instance, I have never been completely comfortable with the term "metacognition").Therefore, much of what I try to accomplish with my students is based on my own observations of what seems to work. I will experiment with different activities that may be class-based or out- of- class based; however, I need to be more consistent in gathering feedback (both assessed or as student opinion) to determine what the students retain from such activities. Among the impediments I find in my continuing attempts to improve the outcomes of my classes is the time and schedule demands. Having to meet the schedule of lab topics or meet a list of competencies can challenge the implementation of what I consider meaningful activities; I need to learn to better balance these factors and perhaps to design more encompassing activities. However, my strengths lie in my passion for teaching a subject I love and my philosophy that teachers need to respect the student. Every student is capable of absorbing knowledge if encouraged to do so in a way that connects with them.

For more information on the GARNET project: http://serc.carleton.edu/garnet/index.html