

TEACHING PERSPECTIVE

Ex Ovo Omnia

Todd Pagano

Rochester Institute of Technology/ National Technical Institute for the Deaf
tepnts@rit.edu

One of history's most diverse thinkers metaphorically depicted humanity's dangerous reliance on nonrenewable energy resources as an unborn chick in an egg. American philosopher, poet, scientist, and mathematician, Buckminster Fuller, described the nutrients in an egg as the temporary and extinguishable support required for the development of an unhatched chick. Once the nutrients are depleted, the chick must break from its shell and cultivate its own mechanism for survival. Symbolically, he explained that the human population must view the use of earth's finite resources as the nutriment in an egg that can be provisionally relied upon in order to provide the necessary time and energy required for mankind to establish alternative energy sources for a sustainable future. I use Bucky's metaphor to describe my own teaching philosophy; the role of the educator as that of a facilitator, or provider of the "egg". Using this mindset and a variety of learning modalities in my classroom, I am hopeful that at the end of the educational process, my students emerge from their "shells" with the necessary skills to be renewable sources of learning unto themselves.

Teaching, like the structure of any metaphor, has a *topic* and a *vehicle*. The *topic* is the intended knowledge that the instructor wishes to disseminate. The *vehicle* is the mechanism of cultivating the intended *topic*. Both should be continually addressed in lesson planning through self-reflection and assessment.

The Topics: In concert with RIT/NTID's Mission Statement, it is imperative to foster learning in the content area without skewing the development of lifelong skills that will help students thrive in the professional community. Professors should facilitate interdisciplinary and general learning, not merely disseminate content-specific information. For example, deaf and hard-of-hearing students in RIT/NTID's Laboratory Science

Technology program not only require the crucial knowledge in the field of chemical testing (i.e. instrumentation, gravimetric/volumetric analyses, etc.), but also critical thinking proficiencies, general science literacy, ethical decision making, global community awareness, and self-advocacy/workplace survival skills.

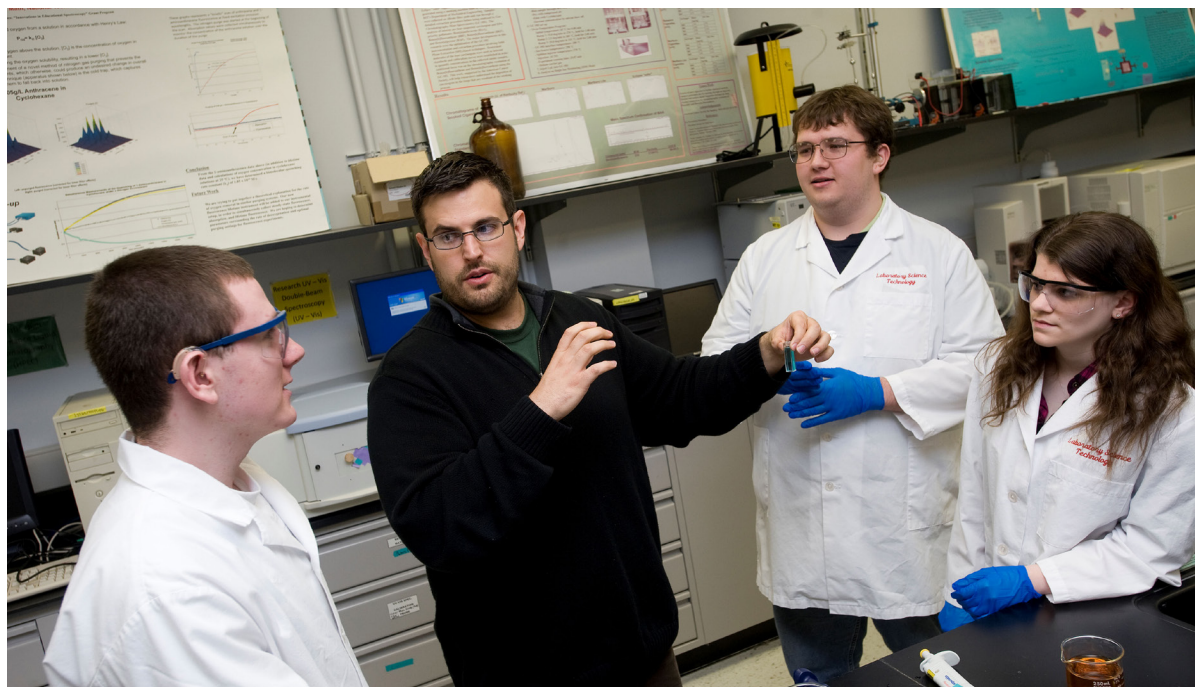
The Vehicles: Useful mechanisms for conveying information include reaching the target audience at the appropriate level while being cognizant of different learning styles, making the material interesting and relevant, and using innovative pedagogical tools. Effective teachers are versed in the scholarship of their field and also have the ability to teach the subject at a suitable level for the identified group of learners. Flexibility in one's

presentation, and an understanding of various learning modes, are paramount to stimulating students who often enter the science classroom/teaching laboratory not truly understanding the subject, how it relates to their lives/interests, or how it will benefit them beyond merely fulfilling degree requirements or prerequisites. It is imperative for instructors to break down these barriers in order to give students an appreciation for the course material, an intimate relationship to the course, and direction. By incorporating real-world/contemporary issues, historical perspectives, and interdisciplinary topics, educators can better express the importance of the course, facilitate student learning, and make the subject captivating/enjoyable/memorable. The use of a variety of pedagogical tools; like supportive technology, inquiry-based and active learning, and involvement in scholarly research can further promote student success by assisting in the transformation of abstract ideas into applicable concepts.

RIT/NTID's Mission Statement

"To provide deaf and hard-of-hearing students with outstanding state-of-the-art technical and professional programs...prepare them to live and work in the mainstream of a rapidly changing global community and enhance their lifelong learning."

Given proper nutriment, a *chick* hatches from the *eggshell* to become a reproductive chicken and a *student* develops into a knowledgeable *lifelong learner*. Keeping with this metaphor, a change in perspective on the age-old question is put forth: "*Which came first- the teacher or the student?*" I believe that teaching is reciprocal; thus, a teacher is a student. In the context of the shared mission of student success by the teacher and the student, instructors should be willing to learn, not only by keeping current in their field, but also by learning from their students. Acquiring, modifying, and improving teaching skills are



dynamic processes that can be continually self-reflection.
developed through feedback from students
and peers, as well as through comprehensive ...*ex ovo omnia* (all from the egg)...

BIOGRAPHICAL STATEMENT

Dr. Todd Pagano is an Associate Professor of Science & Mathematics at Rochester Institute of Technology and Director of the National Technical Institute for the Deaf's Laboratory Science Technology program; a one-of-kind program in the world (i.e., a postsecondary chemical technology program for deaf and hard-of-hearing students). During his career at RIT/NTID, he has led the design and implementation of the LST program, set-up a state-of-the-art instrumentation laboratory, architected the new degree program, and helped to place a large number of deaf and hard-of-hearing individuals into careers in the chemical sciences. He has been honored as a recipient of several awards, including: RIT's Richard & Virginia Eisenhart Award for Excellence in Teaching, Dawan L. Albritton Faculty Humanitarian Award, NTID's Faculty Research Scholar Award, and the American Chemical Society's (ACS) Stanley C. Israel Medal for Advancing Diversity in the Chemical Sciences. He leads several chemical and pedagogical research projects and is a Fellow of the ACS.
