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Cooperative Groups, Educational Technology & Science Teaching

A Success

I have not had the pleasure / frustration of teaching science throughout the entire span of the past few decades, but in comparison to the way, and with the methods I was taught, I would say first and foremost the success comes in the realm of interactive, group learning. In particular, I would point to the ready accessibility (from both a pedagogical and from the student standpoint) of technology that has been developed to make both the teaching and learning of difficult three-dimensional concepts (one comes back to the movement of actin-myosin cross-bridges as the archetypal example of this sort of breakthrough — every book company now is hawking version of computer-generated animations designed to make both the teaching and learning of this difficult concept a "snap." But has it?

Another modest success is the re-emergence of the notion that self-contained groups of students can work together in peer-centered learning contexts. I work in a medical school where this model has been adopted with an apparent high degree of satisfaction on the part of faculty and students alike. To the extent that this approach seems to work with our professional students, more and more of us are looking to model this cooperative learning paradigm in teaching our undergraduate science courses. But is the kind of understanding we're looking to achieve in undergraduate science courses possible through this type of learning system?

When I look out into the wash of students in my large undergraduate course, the throng of faces that greets me teems with an unruly admixture of science majors, doctor/dentist wannabes, sullen non-majors taking the course as a prerequisite, and the blithely "present, but not accounted for mentally." Of such uneven stuff are thus our learning groups composed, and often to the rebellious and angry complaints of those who get "stuck" with a group that doesn't take the same attitude about the course as they do. My personal successes have been in helping these groups over their attitudinal and cooperativity problems, and in getting them to focus on what needs to be learned or accomplished for the group to succeed as a group.

A Vexation

Everybody marvels at electrocautery machines or the body's ability to heal, when watching reality TV shows about plastic surgery. Or, as in one program I saw on the Discovery Channel, the MRI images of two people in the sex act. So, if my students are as interested in these programs as I am — and it has been students who have made me aware of the programs — why am I having such a hard time harnessing all of this free information and high-end media depictions of important anatomic concepts in service of the goal of deeper and critical understanding of the anatomy involved?

Despite students being shown a videotape of an open-heart coronary artery by-pass graft, they neglect to recall the path of bloodflow through the heart — a pathway that is spelled out in

detail by the surgeon as she narrates how the ECMO (heart/lung) device functions. It seems to me that with a better understanding of what these students actually "see" when they view the same operation as my colleagues and me, we might more effectively address the fallacies that novice learners bring to the table about our subject matter, and better prepare them to appreciate both the science and the technology they will witness as we show them anatomy in motion.

By better harnessing of the available cultural and media representations of science to our education goals of developing critical understanding in our students, we can target not only our student viewers exclusively, but the general public as well. A better job of understanding what bombards our life as "culture" will give to ourselves and our students a better understanding of the complex science that underlies the news in the doctor's report, or the newspaper headline.