

Notes from the Life Sciences Carl Wieman Science Education Initiative

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It's Worth a Look: Problem Solving & Cooperative Group Learning

If you had to teach someone a new sport, what would you do? Most people would "coach the person in the sport". Coaching is a modified form of apprenticeship. Now think about teaching someone about the inner workings of the cell. Kenneth and Patricia Heller (University of Minnesota) argue that apprenticeship is a way to get students to guide their own learning process in any subject. This methodology, in conjunction with cooperative group techniques, moves students from pattern matching to a higher level in their problem solving. Their essay, found at Project Kaleidoscope (PKAL), outlines this framework using a sports coaching analogy. Their analogy (basketball) demonstrates the difference between drills (exercises/problems that can be solved using pattern matching) and the game (applying knowledge to actually solving problems). It turns out we might be giving students a lot of drills, but never really getting them into the game. Their paper is at:

<http://www.pkal.org/documents/Vol4UsingTheLearningKnowledgeBase.cfm>. It's worth a look.

The LS-CWSEI Chemistry Content Project.

A perennial question in thinking about curriculum in Biology is: what chemistry do Biology students need? To help coordinate our program with courses offered by the Chemistry Department, Jared Taylor is taking a 'Chemist's look at the content of Biology and Biochemistry courses'. Among the findings are: many Biology courses assume students have facility with interpreting molecular shapes as represented by skeletal (or Kekulae) structures. While this is covered in Organic Chemistry, it may need more emphasis. Physical Chemistry covers topics (e.g., thermodynamics, equilibria and kinetics) that appear regularly in Biology courses so using biological examples in Chemistry courses could help transfer of understanding. Some concepts, such as the specifics of electron rearrangements during chemical transformations (chemical reactions and metabolic pathways), underlie material in many Biology courses, but that chemistry may not be covered *in either* Biology or Chemistry, so program coordination might help biology students considerably. If you are interested in contributing to this project, particularly if your course has a Chemistry component that Jared should include, or you've noted important gaps in student understanding of Chemistry, please contact Jared.

Reflections by graduating students.

To learn about the experiences of students graduating from the Biology program, Harald Yurk and Gulnur Birol have been carrying out focus group interviews. Here are a few highlights from their findings. Students appreciated upper level instructors who integrated primary literature reading with structured discussion activities into their courses. However, students believed that 1st and 2nd year courses contained too much memorization, and not enough emphasis on critical thinking skills, especially considering how important these skills were in the upper level courses.

Increasing the opportunities for interactions with both faculty and fellow Biology students was a priority for improving the student experience. In addition, the students interviewed felt the Biology program was too oriented towards basic research, at the expense of skill development necessary for those wanting to go directly to jobs as biologists in government or private industry. A full report will be available in June.

Tamara's leaving.

Tamara Kelly has accepted the offer of a tenure track job at York University and we're certainly going to miss her. As our first STLF, she did the hard work of forcing us to figure out just what are we supposed to be doing. Every one else's life will be easier because of her contributions. She worked with BIOL 112 and 121 on projects that are on-going and have generated multiple abstracts for education conferences. We're hoping we can continue collaborations and spread the ideas that are central to CSWEI as she takes up new responsibilities. While it's a big loss for us, it's an equally big recognition of her talents, and we wish her all the best east of the Rockies.

We're around.

If you're interested in talking to us about your course(s), or teaching /learning, feel free to contact anyone of your LS-CWSEI team: Tamara Kelly <tjkelly@zoology.ubc.ca>, Jared Taylor <jtaylor@zoology.ubc.ca>, Harald Yurk <yurk@zoology.ubc.ca>, Gulnur Birol <Birol@science.ubc.ca>, George Spiegelman <spie@interchange.ubc.ca>. You might also check out the CWSEI website for information and resources about teaching/learning:
<http://www.cwsei.ubc.ca>.