Beyond sustainable labs

LAB LEADERS USE SOME CREATIVE THINKING TO BENEFIT STUDENTS AND ENVIRONMENT

The fewer chemicals used the better. In an effort to reduce waste, cut costs and help the environment, science labs at UBC's Okanagan campus are taking an innovative, sustainable approach to classes.

Biology labs have done away with real blood and urine, in favour of simulated fluids to the benefit of students and the environment.

Donna Young, lab manager in the biology department, says using real urine and blood presented a variety of hazards to the students and created environmental issues, so she and a summer student started looking at alternatives.

Young found a recipe for artificial blood and urine, not only eliminating health risk to students, but also the need to dispose of contaminated materials, such as plastic cups, that come in contact with the human fluids.

In the chemical department, Ed Neeland, associate professor of chemistry, has developed a way to re-use chemicals, drastically reducing the amount of substances requiring proper disposal.

Neeland says disposing of the chemicals after each class had used them "seemed terribly wasteful" so he devised a method to bring the chemicals back to their original state, allowing them to be used repeatedly.

"If you did it right in a circular way, you would end up with the original chemical," says Neeland. "The waste would be minimal. It's costly and it takes energy to get rid of the chemicals. We also do not have to buy more material because the students have already made it."

Natasha Murphy, environmental chemistry major, spent last summer working on the Cascade Chemical project and was pleased to discover Neeland's ideas worked well.

"My last product was what I started with in the first place. It was a complete circle. It was a really interesting learning experience and with a little more work it could work really well in labs."

Young began a quest to replace the human fluids with safer and more environmentally friendly versions while ensuring the students get the same educational value from the replacements. She found some suitable replacements, but they were expensive to purchase.

So 'recipes' were discovered online and the lab now makes their own artificial blood and urine, at a substantially lower cost.

"Up to 1,000 students (per year) were working with blood and urine," says Young. "There are many potential risks exposing that many students to bodily fluids."

Plus, a huge amount of waste was generated that was classified as a biohazard that needed proper disposal.

"Of course, we have to pay to get rid of those materials," says Young. "Anything that came in direct contact with bodily fluids must go in the biohazard waste, creating lots of additional costs."

By creating the simulated urine in bulk, the need for hundreds of small, plastic containers is eliminated. The students used to supply the urine samples themselves and once those tiny cups were used, they had to be treated as a biohazard.

"It means less material that will go into the landfill," says Young.

But Young was not done there. She noticed stacks of disposable purple rubber gloves were piled up at the end of the day, creating more chemically contaminated waste.

The solution was simple, cost effective and good for the environment: Young simply purchased reusable rubber gloves from a local dollar store.

At the end of the class, students merely wash the gloves, hang them to dry and the same pair can be reused many times.