Teaching and Learning:
Web Engagement – Are We at the Next Level?

By Cheryl A. Lindeman, Ed.D., Central Virginia Governor's School for Science and Technology

When I am looking for new web resources for my students, I often sit down at the computer, use my favorite search engine, sip a cup of coffee, and then become totally immersed into the information highway. Recently, however, I discovered new web resources by attending a workshop and by reading an alumni magazine. I introduced both web resources to my senior classes and immediately received very favorable responses. Both resources were being used just days after my introduction. I think they passed the "beyond the casual visitor" test!

I am excited about sharing these resources with you. During our 2011 Professional Conference in Austin, I will have a session talking about these resources related to teaching interdisciplinary environmental lessons. If you already have been using them in your classes, please email me about your experiences.

First Resource: Gapminder
If you are interested in world population data it is possible you've heard of Hans Rosling's *TedTalk* about the world. When you search for him on the web, you will find a wealth of information at Gapminder.org. According to their homepage, "Gapminder is a non-profit foundation based in Stockholm. Our goal is to replace devastating myths with a fact-based world-view. Our method is to make data easy to understand. We are dedicated to innovate and spread new methods to make global development understandable, free of charge, without advertising. We want to let teachers, journalists and everyone else continue to freely use our tools, videos and presentations."

The Gapminder website has all the tools both teachers and students need to start a class lesson or an individual project. The presentation and web design create a learning platform that can be used by a class or individual learner, in an online course, or for a demonstration. The teacher section is in the beta version, providing quick access to resources relating to Gapminder World, as well as for looking at the world population over 200 years, life expectancy, and global development.

Be cautious when you see the words "for your lectures" because the Gapminder resources can easily be accessed by students as they develop their own understandings. And if you are looking for data sets, go to http://www.gapminder.org/data/. You can streamline your lesson plans by accessing this up-to-date information that has been screened by scientists and statisticians.

More importantly, the design of the site allows learners to grasp information in a shorter time than usually possible with the included visualizations. For example, it is possible to track changes in agriculture across the biosphere and figure out the trends in over 50 countries in one dynamic graph! Then, it is possible to manipulate the data in log-based 10 and linear formats with a mouse click.

Recently, I introduced our Senior Science Scenario problem about modeling the biosphere in 2050. I used the GapMinder *CO_2 Emissions Since 1820* visualization to introduce the problem. My seniors were amazed to see all the data being processed across the screen. Later I watched some of them enjoying the opportunity to say what if and then letting the graphs unfold data before their eyes. "Gosh, this is so cool," responded one young lady who was visiting Gapminder for over 30 minutes on her own time.

Second Resource: N-Print
N-Print was highlighted in a short column in the Summer 2011 *University of Virginia Magazine*.

Cheryl A. Lindeman, Ed.D. is the biology instructor/partnership coordinator at Central Virginia Governor's School for Science and Technology. She can be reached at clindeman@cvgs.k12.va.us.

Dr. James Galloway, Associate Dean for the Sciences in the College and Graduate School of Arts and Sciences (my former environmental science professor) and graduate student Allison Leach were listed as two of the collaborators on the "nitrogen footprint" web-based calculator. Their web site, www.n-print.org, is part of the International Nitrogen Initiative, whose goal is to educate people to realize that monitoring nitrogen is just as important at carbon. Launched at the February, 2011 AAAS meeting in Washington, DC, their press release (http://www.n-print.org/node/40) highlights the need to think on a global perspective about nitrogen rather than only looking at data sets about the Chesapeake Bay and the Gulf of Mexico.

I was able to immediately incorporate this web tool to help us answer questions about the impact of nitrogen and how to use best management practices and education to address problems. They were able to make connections with reliable resources and understand why scientists are calling us to action.

"There are more untold stories about nitrogen" according to Dr. Galloway. N-Print allows us to bridge the gap with our students as they ask their own questions. Based on personal communication with him, N-Print expects to have lesson plans available in the near future.

Summary

The challenge for all of us working with talented STEM students is to engage them with like-minded science leaders through direct contact and by using meaningful web resources. I believe that we should intentionally embed web resources into our teaching and learning activities. GapMinder and N-Print are candidates for taking students to another level of web engagement. The challenge for teachers is to introduce and model web engagement as another tool for students to be effective learners so they can analyze data sets and make better and more informed decisions "for" our biosphere.

References

Gapminder Foundation. www.Gapminder.org accessed May 15, 2011.

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