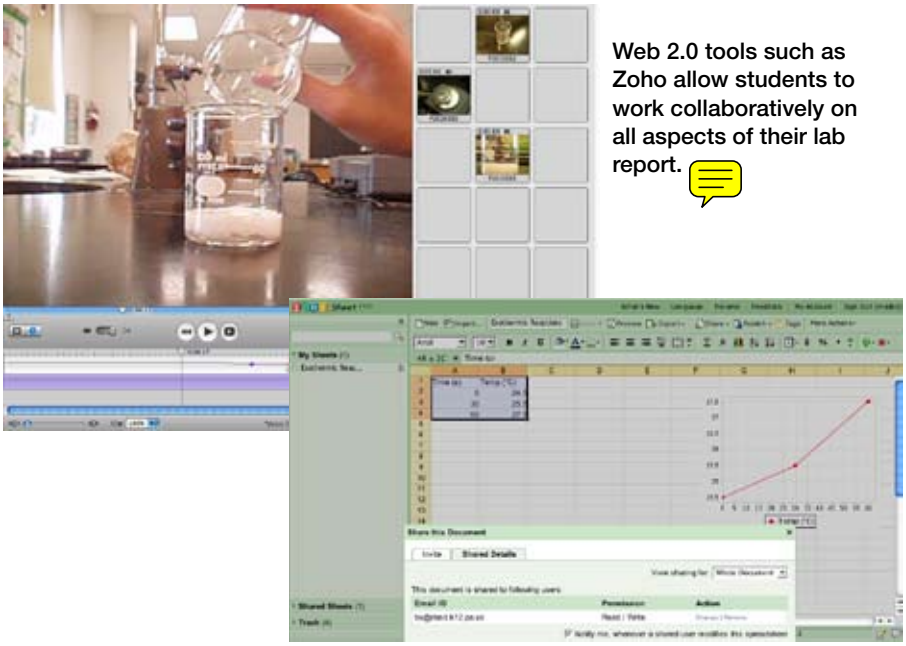
Changing the Face of the Traditional Lab Report



Web 2.0 tools such as Zoho allow students to work collaboratively on all aspects of their lab report.

The role of the lab in science education is expanding. A National Science Teachers Association position paper on the role of lab experiences stresses that students should improve their ability to collaborate effectively with others in carrying out complex tasks, sharing the work of the task, assuming different roles at different times, and contributing and responding to ideas.

Technologies currently exist that allow teachers to provide students with opportunities to develop into modern scientists. It is important to note that the specific technology should not be the focus of the laboratory activities, but rather a support system to achieve curricular objectives.

By Jared Mader and Ben Smith

Collaboration in Science Activities

In a typical science class students might work together to collect and analyze their data. Excel provides an excellent way for students to both organize their work and perform multiple calculations. The difficulty comes when students leave the classroom without finishing their work. As veteran teachers we would often hear students claim that their partner has the data as an excuse for not completing the work.

Recent developments in Web 2.0 tools now allow students to work collaboratively on all aspects of their lab report, offering the power of spreadsheets and word processing to their online work environment. Zoho and Google Docs, bearing a remarkable resemblance to the Microsoft Office suite, are two examples of products that allow students to work synchronously through the Internet. One student logs in with an e-mail address and creates a file. That student then shares that document with the e-mail addresses of the remaining members of the group. Once shared, the group can now edit that document synchronously or asynchronously. This type of collaborative work ensures that all members of the group contribute equally to the product.

Another way that students can leverage these tools is through online course management systems. We currently use Blackboard and SchoolCenter to host our discussion boards. However, Gaggle and Moodle offer free solutions to creating online learning environments for students. In the traditional mold of the laboratory experience, completing the lab write-up marks closure to the lab, leaving little time or opportunity for group discussion relating to the actual results. Through specific prompts and directed questioning, online discussion forums can extend the learning of the lab, relating the material directly to the curricular objectives.

Communication in Science Activities

Another important piece of the lab experience is the ability of the students to communicate their findings. Providing students with instructions to explain what they did, what they found, and how they know what they found, students become responsible for finding ways to communicate what they have learned. We use iMovie, Inspiration, and PowerPoint to allow students to communicate their work in non-traditional ways.

Each piece of software requires a new skill set in order to publish work. In the beginning, students learn how to use these applications through individual assignments throughout the school year. The use of templates is important to help students learn the potential uses of an application. Teacher-designed templates include properly positioned text boxes and image files. Students edit the files by adding their own graphs, text, and images, replacing those from the original template.

Many labs already make use of sci-

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entific probeware and software such as Pasco's DataStudio or Vernier's Logger Pro. Students can use screen shots of data collection and copies of their graphs to supplement their new laboratory write-ups. Additionally, students are given access to digital cameras and camcorders so that they can emphasize their analyses through referral to actual footage from the experiment. Students can easily narrate their video or work using the recording tools that come with iMovie or MovieMaker (both free software). They can also use Audacity, a cross-platform audio recording and editing software that is commonly used to create podcasts, tapping into the great power of requiring students to verbalize their findings.

Conclusion

There was a time when scientists worked in their labs with the only help coming from a trusty assistant. Today's modern science requires collaboration along with an ability to communicate the completed work. We can leverage technology to make this happen for our students. Students are accustomed to being able to communicate with their peers through technological means. As teachers we want to harness this ability and make use of new tools to further their science education.

Resources

Audacity: http://www.audacity.sourceforge.net
DataStudio: http://www.pasco.com/datastudio/
Gaggle: http://www.gaggle.net
Google Docs: http://docs.google.com
The Integral Role of Laboratory Investigations in Science Instruction: http://www.nsta.org/about/positions/laboratory.aspx
Logger Pro: http://www.vernier.com/soft/lp.html
Moodle: http://moodle.org
National Science Teachers Association: http://www.nsta.org
Zoho: http://www.zoho.com

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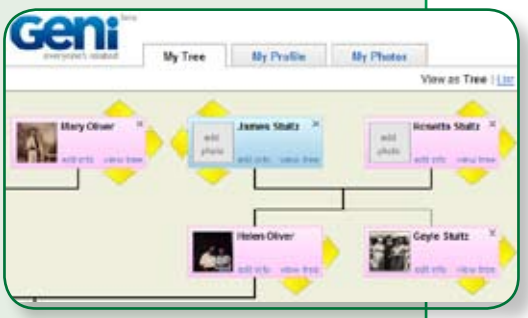
Student Collaboration with Trees and Trails

Geni is a family tree tool that allows users to define and organize individuals, marriages, and children in a visual display. For each individual in the tree, personal information such as dates of birth and death can be entered, digital pictures can be uploaded, biographies written, and memories shared. In the Web 2.0 spirit, the tool is collaborative, allowing the creator to enter e-mail addresses of family members, inviting them to co-create the shared space.



Geni: http://www.geni.com

In the classroom, Geni could be used by individual students to research their own family history, and as the trees fork backward, reflect with other students on the topic of immigration and immigrants in each of our families. Teachers could also set up mock trees and assign each student one person to research (e.g., the descendants of George Washington). Students would then be responsible for collecting and writing the demographic and biographical information for their assigned person, with the whole class contributing to a shared tree.

TrailFire is a Web collection and annotation tool that allows trail blazers to string together a set of existing Web resources and mark-up or annotate the pages for trail users who follow their path. A unique URL is generated for each path that can be shared with others. TrailFire includes collaboration features, including the ability for trail users to add comments at any stop along a trail, or the ability to create a "wikitrail" where users can add new stops to a trail started by someone else. This tool could enable students conducting research in digital archives to capture evidence supportive of a theory they are trying to prove (e.g., the eight documents I've marked on this trail provide evidence of racism in the U.S. Supreme Court).

Trailfire: http://trailfire.com

—Kevin Oliver
[Need author bio.]

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