Furman Magazine

Volume 52
Issue 1 *Spring 2009*

Article 19

4-1-2009

Technology meets vision with chemistry textbook

Josie Sawyer '09

Technology meets vision with chemistry textbook

Not many college students can say they have written their own textbook, but for Mac Felmy '11 and other Furman chemistry students, it's all in a day's work.

Felmy is a student editor for Furman's ChemWiki project, an on-line textbook that allows students in organic and bio-organic chemistry to write and edit the text for what they're learning in class.

Chemistry professor Brian Goess came up with the concept during the 2006-07 academic year, his first at Furman. When a student asked him to share her lecture notes with the class, he found that the notes contained incorrect information. Although he thought the idea had merit, he wanted to prevent the spread of inaccurate information and give students an effective way of helping one another learn.

"I guess the question that arose was: How do we allow students to share information with each other and also give them the tools to do so successfully?" says Goess.

Fellow chemistry professor Greg Springsteen saw a similar need for student collaboration among research students. "It's hard to transfer information between generations of researchers," he says. "We needed a way for researchers to talk to each other and post information on-line."

With the rising popularity of user-editable Web pages such as Wikipedia, Goess and Springsteen saw the potential to create what Springsteen calls a "student data repository." They envisioned a site where students could talk to each other on-line, share data, and edit and correct each other's work.

"The students are the project," says Felmy. "Everything on the site is written by students. This is about students speaking their own language — a language that other students understand."

Felmy says the ChemWiki project encourages students to explore difficult concepts outside of a textbook. "When you are posting a page on the Wiki, you have to explain things in your own words. You're not just memorizing the material and spitting it out on a test."

Once the concept was in place, Goess and Springsteen turned to Mike Winiski in Furman's Center for Technology and Engaged Learning (CTEL) to design the Web site.

"My job was to make the technology meet the vision," says Winiski. "I didn't do a whole lot of custom development. It was mostly taking the requirements that the professors came up with and surveying the landscape to see what technology was out there that could do what they needed to be done." The result is a site that serves as an on-line text for organic and bio-organic chemistry courses. To see how it works, visit www.engagefurman.com/mag/wiki.

The bio-organic course is unique to Furman and is based on the assumption that most chemistry students who take organic chemistry plan to enter health-related fields. Because this course is not taught anywhere else in the country, there is no formal textbook.

Goess and Springsteen saw the ChemWiki site as a better alternative to a traditional textbook. "We saw a flaw in textbooks. They are written by people who already know the material very well," says Goess. "Because the teachers and textbooks are so far removed from the learning process, we've forgotten a lot about what it's like to learn this complicated material. It's the students going through the course who have insights we have lost over time."

Each student is assigned a lecture and must create a file on the site that documents the material covered in class that day. Students use a program called ChemDraw to create and manipulate complex chemical structures on their computer screen. They can add these structures to their ChemWiki pages as further explanation of a particular concept.

JEREMY FLEMING

Student editor Mac Felmy works on an entry with Greg Springsteen (left), Brian Goess and Mike Winiski.

"We believe that 10 years from now we will have the single best textbook document for this [bio-organic chemistry] course, because it will have been created, modified and improved upon by generations of Furman students," says Goess.

Adds Winiski, "We are studying what types of students benefit most from the Wiki so that we can keep developing and improving the project. This is just the beginning."

The project was honored last fall at the Innovision Awards, a competition recognizing technical innovations in Upstate South Carolina. The Furman team received the Innovation in Education award.

Goess says, "The long-term plan is to communicate this technology broadly. We hope to share what we have learned with the rest of the academic world and to help them avoid the hurdles we've encountered along the way."

— JOSIE SAWYER '09

Reprinted from Engage *magazine (Volume 5, No. 1), a publication of the Furman Admissions Office. The author is an English major from Raleigh, N.C.*