Faculty Showcase ’08

Michael Berger

College of Arts and Sciences

Goals

- Increase student understanding through step-by-step multimedia explanations of homework problems.
- Provide detailed solutions to quantitative homework sets in a video format so that students may view them asynchronously outside of the classroom.
- Decrease the overall time spent discussing problem sets in class by focusing on the material that is least understood by the class as a whole.
- Build up a portfolio of video solutions that will both save preparation time and reduce the demand for tutoring.

Sponsored by Academic Technology at Simmons College

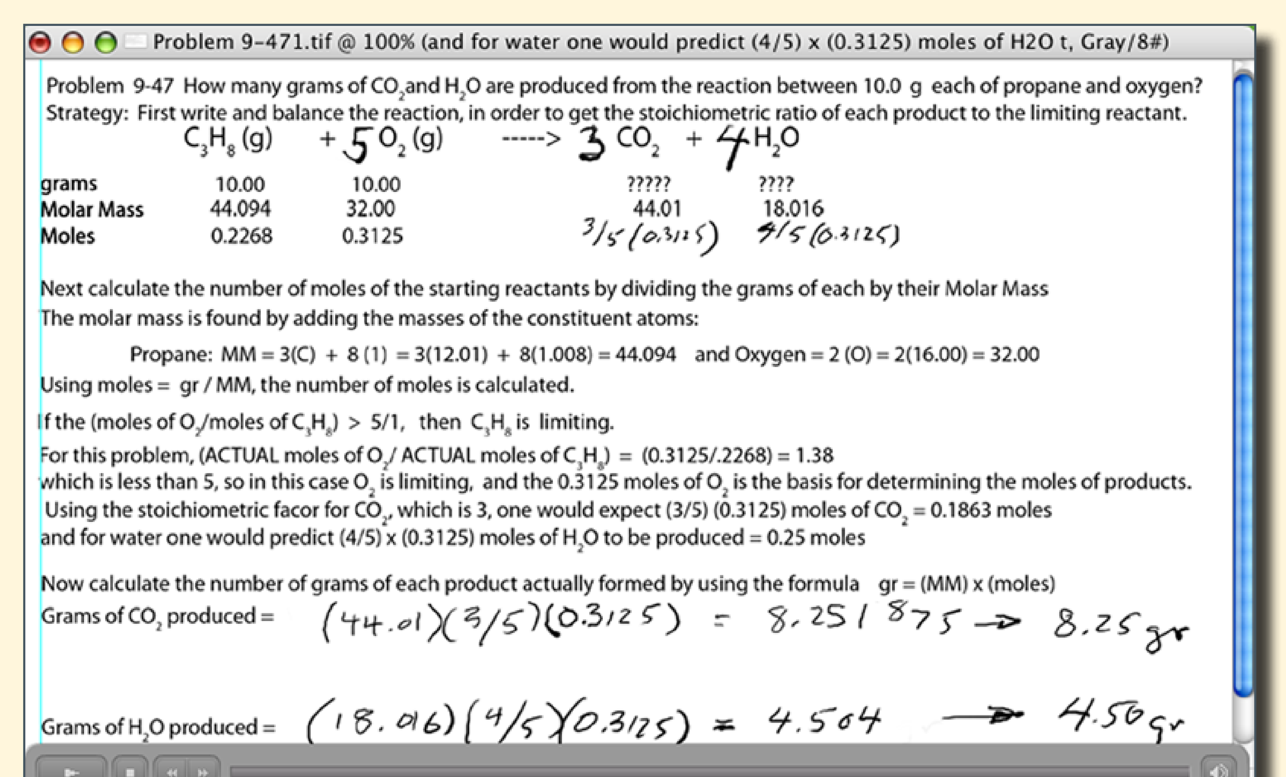
Video Instruction for Chemistry Problem Sets

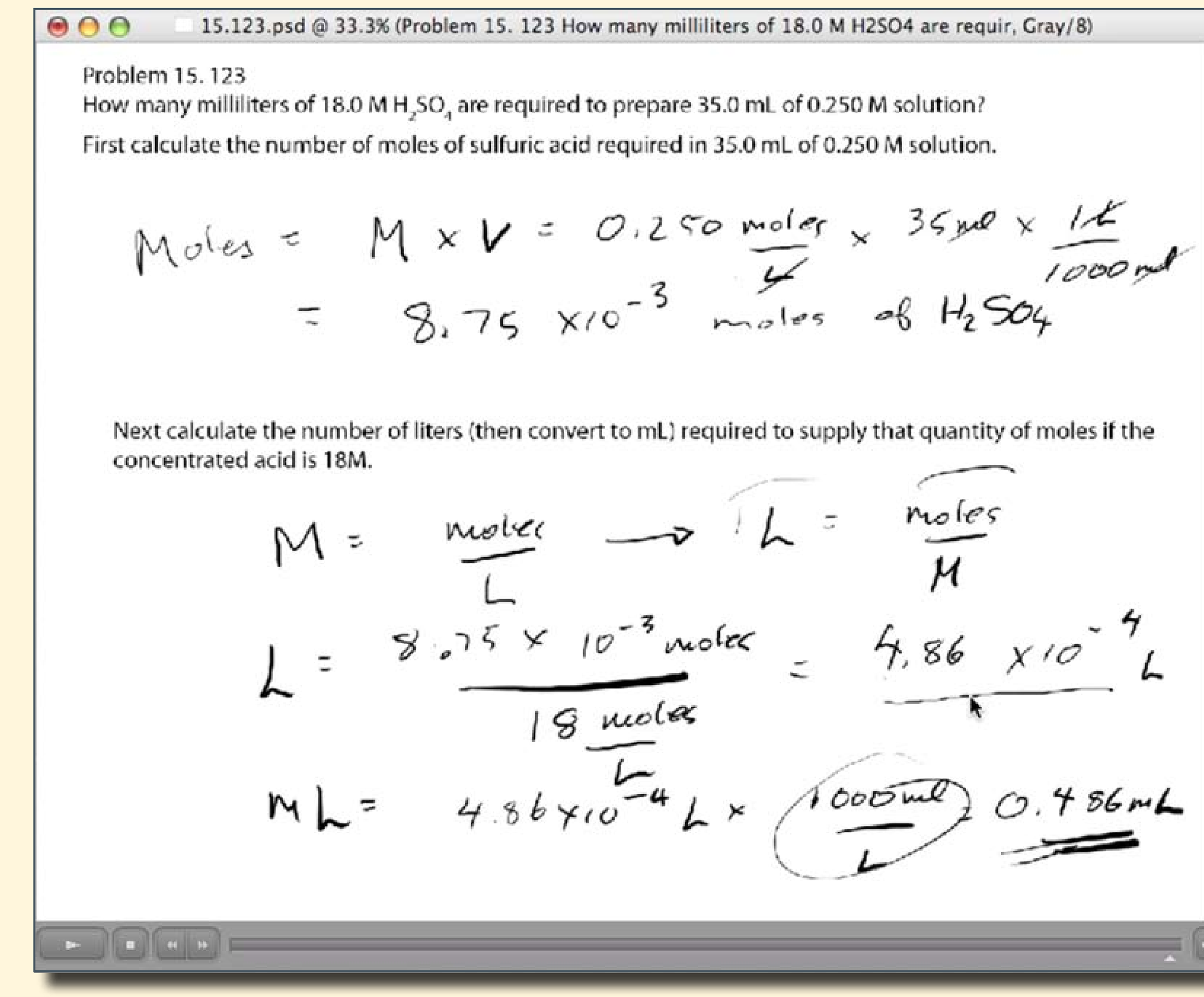
Project Overview

Using funds and support obtained through a grant from the Pottruck Technology Resource Center (PTRC), I have established the process and technology needed to create and post video solutions for homework problems in Chemistry 226, “Quantitative Analysis.” These video solutions use technology to improve student outcomes by providing instruction through the use of multiple media types, and by increasing accessibility to specific problem-solving skills. In the recent Shared Academic Technology Vision (SATV) process, the use of technology to support discipline-specific concerns was a top priority. My goals for this project are aligned with this priority.

Solving quantitative homework problems is critical to understanding in the sciences. While many students need to review homework problems in a step-by-step manner, doing so requires extensive class time and often results in deferring the introduction of new material. Also, not every student requires a step-by-step explanation for every problem. These video solutions allow me to limit review to material that was broadly misunderstood and to spend more class time covering new material. My use of the technology has, in effect, expanded the total time for instruction (which now includes class time plus the video solutions) and may actually decrease the large demand for tutoring. The technology allows the students to access what they need at the pace with which they are comfortable and to make the best use of their time.

After working with me to evaluate a range of software tools and workflow processes that seemed to offer simplicity and low cost, Academic Technology recommended an easy-to-use screen capture program called Jing. This program allows me to record voice audio and screencast video while viewing or manipulating the content within an active window. In a typical solution using Jing, scanned image files of homework solutions are visible as I offer audio comments and tips on how to solve the problems. In addition, use of a digital pen tablet allows me to hand-write chemical equations into the active window while simultaneously annotating them with audio commentary. Some of these videos demonstrate real-time problem solutions within Excel with my spoken comments added in as I develop a spreadsheet. Finally, I upload the video file produced by Jing into eLearning in order to make it available to students.





Applications Beyond

The project addresses the need for a hands-on homework problem review and offers a demonstration of how to solve the numerical problems typically encountered in chemistry and other sciences. The availability of video solutions extends the time and nature of the class to create a technology-enhanced model that features classroom lectures and demonstrations, laboratory hands-on experience, and web-based video solutions. Since many students taking science classes are overbooked with labs and classes, the web-based video solutions library allows the student to access problem-solving help via eLearning on her own schedule.

Developed with/Funded by P·T·R·C partners in learning