

Project Year

2009

Project Title

Animations and Real-Time Graphs for General Chemistry

Project Team

Kit Bowen, Professor, Chemistry, Krieger School of Arts & Sciences; Zishan Mohammed, Graduate Student, Biotechnology, Krieger School of Arts & Sciences; Junaid Afzal Graduate Student, Biotechnology, Krieger School of Arts & Sciences; Salman Mohammed, Undergraduate Student, Psychology, Krieger School of Arts & Sciences

Audience

Students in the Introductory Chemistry class

Pedagogical Issue

The pedagogical issue that will be explored through the Technology Fellowship addresses the learning preferences of students, specifically students who are visual learners. Currently, students are shown static overhead projector slides with examples of what different pressures, volumes, and temperatures changes have on an object. Students need a real-time example of what changes look like in the ideal gas law and in galvanic, concentration, and electrolytic cells.

Solution

Specific concepts students have been struggling with in electrochemistry and the ideal gas law will be targeted by the technology fellows who will create the animations needed to make these concepts easier for students to learn.

Technologies Used

Adobe PDF, WebCT, Flash, Java

Project Abstract

The pedagogical issue that will be explored through the Technology Fellowship addresses the learning preferences of students, specifically students who are visual learners. By incorporating animations into basic chemistry concepts of electrochemistry and the ideal gas law, students will have the opportunity to enhance their understanding of these important topics. Students will have the advantage of supplementing what they have learned in class with a more visual and interactive tool. Flash and Java will be used in creating the animations. Flash is able to handle advanced animations and it has a high compression quality. Java will be used to provide the interactive solution for the ideal gas law $PV=nRT$. Java will also provide the visual accommodation of changing variables of this equation. This project will help students truly understand the theories behind electrochemistry, including the galvanic cell, concentration cell, and electrolytic cell and the ideal gas law equation $PV=nRT$, and will allow students to move

away from simply memorizing formulas and concepts into actually understanding their inherent theories.

I will measure the impact of the fellows' work by seeing how well students answer questions on tests relating to electrochemistry and the ideal gas law. Further, I will create two surveys on WebCT to see if students actually have a better understanding of the concepts after working with the animations. I plan to keep the animations on the class WebCT site and make them available for other chemistry classes.