Report On “Technology and Assessment in Chemistry”

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The workshop “Technology and Assessment in Chemistry” discussed a University of California at Los Angeles based and National Science Foundation funded project that is heavily invested in new instructional technology. Issues related to the convergence of technology and student learning and assessment were examined. The workshop was run by Bob Kozma of the Stanford Research Institute. Kozma first outlined the goals of the UCLA project entitled the “Molecular Science Project” developed by Arlene Russell and Orville Chapman. Unlike other curriculum-reform projects, assessment is an integral part of the innovation. Kozma proceeded to describe his efforts to develop new assessment tools.

"Technology and Assessment in Chemistry" by Bob Kozma was presented at the "Day 2 to 40" workshop symposium held May 10–11, 1997. The two-day event was held in the Willard H. Dow Chemical Sciences laboratory building on the central campus of The University of Michigan in Ann Arbor, Michigan. Each of the articles that comprise this issue was written by one of the group of reporters whom I asked to attend each session to take field notes and then follow up with the session leader and participants afterwards.

—Brian P. Coppola, Proceedings Editor
Report

The UCLA program is unique in the fact that it is a totally digital curriculum. The program instructional goals listed below were provided to workshop participants in the form of a handout.

*Molecular Science Project Instructional Goals*


1. Students will demonstrate an understanding of key concepts and principles related to chemical properties, structure, reactivity, and theory.

2. Students will be able to use the tools of modern science, including general productivity tools, such as word processors, spreadsheets, presentation software, and the Internet, as well as scientific tools, such as spectrographic equipment and molecular modeling programs. Students will be able to specify what these scientific tools are used for, when they are and not used, and what assumptions are made in using them. Students will be able to interpret the output of these scientific tools.

Scientific Problem Solving

3. Students will be able to analyze complex, authentic problems and design solutions that involve the application of the key scientific concepts and principles cited above. They will be able to come up with authentic problems of their own.

4. Students will be able to take on the role of scientist-in-charge by making decisions about next steps in the process. They will develop models that account for observations and explain data; they will devise means of testing models, make observations and acquire data from databases and simulated instruments, and modify or reject models that have problems.

5. Students will develop the symbolic analyst’s capacity for abstraction and system thinking. This involves the ability to explain how pieces of a system interlock and interact, to interrelate new knowledge to previously learned knowledge, and to see how the subparts fit together.

6. Students will develop critical-thinking skills. They will be able to analyze, compare, and critique their own work and that of others.