IMPORTANCE OF HANDS-ON LABORATORY ACTIVITIES

Hands-on activities enhance learning significantly at all levels of science education. These activities are usually the basis for a “laboratory” class or laboratory portion of a class. In a hands-on chemistry course, students directly experience laboratory chemicals and their properties, chemical reactions, chemical laboratory apparatus, and chemical laboratory instruments. These activities are essential for learning chemistry.

Computer simulations have been developed that can mimic laboratory procedures and have the potential to be a useful supplement to these hands-on activities in American classrooms. They are often used as a pre- or post-lab exercise to reinforce the procedural and safety issues of a laboratory experience. However, these simulations, by their very nature, do not involve contact with laboratory chemicals or equipment and thus should not be considered equivalent replacements for hands-on experiences critical to chemistry courses at any level.

With the increasing availability, sophistication and power of web-based tools and computer simulations, a growing number of academic programs are offering “virtual” chemistry laboratory courses. They often are intended to affordably increase student exposure to chemistry, to reduce costs, or to eliminate hazardous wastes and safety concerns.

Because computer simulations are not a substitute for hands-on laboratory experience, academic transcripts should clearly disclose whether a chemical laboratory course is hands-on or simulated. To meet the needs of potential employers and academic institutions evaluating potential transfer of credits, academic transcripts should reflect an applicant’s laboratory experience. Thus, the Society believes that computer simulations are not a substitute for student hands-on laboratories from the kindergarten level through undergraduate education. Furthermore, ACS supports identifying designations for laboratory courses that involve the substitution of simulations for more than 20 percent of the hands-on, laboratory activities.