

# **NACOL's Position on Advanced Placement Science Audit Criteria**

*(NACOL statement, 4/13/06)*

## **NACOL Opposes New Criteria Restricting Online AP Science: Recommends the College Board Allow "Dry" Virtual Labs**

NACOL recommends the College Board re-evaluate program regulations and change specific policies that impede student access to expanded educational opportunities. The College Board's new audit criteria prohibit AP science courses from using virtual laboratories to meet lab requirements. The College Board's new restrictions prohibit AP Science Courses with virtual "dry" labs from meeting the criteria.

At a recent Senate hearing on math and science education, Secretary of Education Margaret Spellings stated that 40% of high schools do not offer Advanced Placement courses.

Advanced Placement courses offered online, as well as face to face, are providing improved access and opportunities for students across the United States. State education departments, school districts, charter schools in our public school system as well as for-profit providers are making Advanced Placement available online and giving students new opportunities to access the best education available in the 21<sup>st</sup> century.

Paul Vordnham, a leading researcher and author of studies on virtual labs' effectiveness, asks: "Should we deny these students the opportunity to learn science and find out how scientists gain knowledge because we insist that the only way to learn . . . is in an on-campus lab?"

The students without access to rigorous, Advanced Placement courses are most likely to attend rural schools, have low-income status or attend schools with a high minority population, according to the U.S. Department of Education's National Center for Education Statistics (NCES) studies on K-12 Distance Education Courses for Public Elementary and Secondary Schools (NCES 2005), Dual Credit and Exam-Based Courses in U.S. Public High Schools (NCES 2005) and Dual Enrollment of High School Students at Postsecondary Institutions (NCES 2005).

NACOL encourages all students to have access to the highest quality AP courses in math, sciences, foreign languages and all subjects and welcomes new technology and 21<sup>st</sup> century learning environments.

However, the College Board has imposed restrictions on online AP science courses requiring that they include "a guided, hands-on (not virtual) laboratory experience."

The exact quote is as follows: “Note: Online science courses can only be labeled AP if the provider either independently or in conjunction with the students' local school principal ensures that students have a guided, hands-on (not virtual) laboratory experience. All AP science courses, including online courses authorized to use the AP designation, require the presence of a science educator to supervise the students during their laboratory work.”

This information and more information is on their Web site at:

<http://apcentral.collegeboard.com/article/0,3045,151-165-0-51274,00.html>

Where is the research for this new policy? NACOL and its members are concerned by this decision and its likely adverse impact on many students who may not have access to AP science courses as a consequence of this action.

Research scientists, universities and laboratories across the nation and the world employ virtual simulations and laboratories to explore complex scientific principles. America's students need to be able to have options to take Advanced Placement science courses online and choose what best suits their individual needs and personal situations. At the 40% of schools unable to provide Advanced Placement science courses or labs, online courses provide opportunities to student in schools that do not have qualified teachers, expensive laboratory equipment and facilities to offer the courses. Virtual laboratories offer these opportunities, and should be judged based on student achievement.

The College Board has designed an end-of-course test for every Advanced Placement course. The outcomes on the AP test for the sciences should be the judge of student achievement, not the input or interface. Student achievement and access to learning are the goals.

The national average of pass rates for the Advanced Placement tests (a score of 3 or higher) is 60%. For online programs, such as Virtual High School and Florida Virtual School, AP pass rates are higher by ten points than the national average – 70%.

## Conclusion

NACOL recommends including virtual, or “dry” laboratories for the science courses as fulfilling the laboratory requirements. A College Board mandate for “wet”, hands-on laboratories, while rejecting “dry”, virtual labs, will mean that many of our country's neediest students – rural students, working class students, low-income students, and minority students – will lose access to the Advanced Placement offerings online. For these reasons of access and quality, NACOL opposes the criteria for “wet”, hands-on laboratories only.

Requiring a print-based college textbook for Advanced Placement courses may also price these courses out of their reach – and all of America's students have the fundamental right to an excellent education.

Clearly, online preparation for the AP tests is working, and allows students with fine minds but inadequate laboratory resources to experience success in college-level courses they might otherwise think are beyond them. In a way, the entire AP experience is a “virtual college experience” by itself, intended to pick out certain key features of the college intellectual experience to focus on, while allowing other aspects (teaching of large science sections by foreign-language graduate students, for example) to be minimized.

Both of these policies regarding virtual laboratories and textbooks are needlessly restrictive for the correct goals of the AP program, which should not include filtering high school students based on their access to physical facilities and materials. We should all be focused on the outputs of education, student learning, not on specifying the inputs.

References:

*Innovative Educational Practice: Using Virtual Labs in the Secondary Classroom*  
<http://www.thejeo.com/Kerr%20Final.pdf>

Kleiner, B. and Lewis, L. (2005). *Dual Enrollment of High School Students at Postsecondary Institutions: 2002-2003* (NCES 2005-008). U.S. Department of Education. Washington, DC: National Center for Education Statistics.

Setzer, J.C., and Lewis, L. (2005). “Distance Education Courses for Public Elementary and Secondary School Students” 2002-2003 (NCES 2005-010). U.S. Department of Education. Washington, DC: National Center for Education Statistics.

Waits, T., Setzer, J.C., and Lewis, L. (2005). *Dual Credit and Exam-Based Courses in U.S. Public High Schools: 2002-2003* (NCES 2005-009). U.S. Department of Education. Washington, DC: National Center for Education Statistics.

*The potential of virtual laboratories for distance education science teaching: reflections from the development and evaluation of a virtual chemistry laboratory.*  
<http://science.uniserve.edu.au/pubs/procs/wshop8/outws004.pdf>

*What Works: The Role of Distance Education Laboratories for Online Science Courses*  
[http://www.pkal.org/documents/Vorndam\\_OnlineTechnology.pdf](http://www.pkal.org/documents/Vorndam_OnlineTechnology.pdf)

An Example of a “Dry” Laboratory:

**CSU ChemLab**

- [-] Suggestions and Help
- [-] Lab Procedures
  - [-] What to wear
  - [-] General lab behaviour
  - [-] Fire in the lab
  - [-] Chemical spill
  - [-] Using a burette
  - [-] Using a pipette
  - [-] Using balances
- [+] Apparatus
- [+] Viewpoints



**Beaker: 250ml**

Beakers are convenient for holding reagents and can be used as reaction vessels. Beakers are marked with very approximate volumes, which serve merely as a rough guide to the volume of liquid in the container.

[General safety information about using glassware](#)

[General information about measuring volumes](#)

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## About NACOL

The North American Council for Online Learning (NACOL), founded in September 2003, is the international K-12 non-profit organization representing the interests of administrators, practitioners, and students involved in online learning in the United States, Canada, and Mexico. NACOL's mission is to increase educational opportunities and to enhance learning by providing collegial expertise and leadership in the K-12 online teaching and learning marketplace. The association strives to achieve this mission by leading initiatives to: conduct research to enhance quality K-12 online learning; encourage collaboration among practitioners in the online learning marketplace; and promote the success and effectiveness of online learning. For more information, visit [www.nacol.org](http://www.nacol.org).