Building Locally - Linking Globally

Networking Micro-Communities of New Science and Math Teachers Using the NSDL to Advance Instructional Excellence in High Need Schools (DUE 0735011)

Elizabeth Ambos, California State University (CSU) Office of the Chancellor, Long Beach, California; David Andrews, CSU, Fresno; Gerry Hanley and Joan Bissell, CSU Office of the Chancellor; Robert Desharnais and Paul Narguizian, CSU Los Angeles; John Ittelson, CSU Monterey Bay

Abstract

With funding from the National Science Foundation (NSF), the California State University (CSU) will create and support networks of CSU Robert Noyce Scholars, connecting them to a variety of digital media-based learning objects, lesson plans and other support services. These small teacher networks, termed "micro-communities", will be enabled through MERLOT's Institutional Teaching Commons (ITC) program, which the CSU has already established in science education and other disciplinary areas, and which is linked to the extensive collections of NSF's National Science, Engineering, and Mathematics Digital Library (NSDL). The "Build Locally, Link Globally" capabilities of the MERLOT ITC's will enable Noyce Scholars and their faculty mentors to: (1) Build a select collection of online science and mathematics learning content and curriculum that is successful in high needs schools, particularly in middle and high schools; (2) Share experiences with instructional applications of NSF's NSDL resources and such tools as effective and engaging "Virtual Courseware" science simulations, designed to solve instructional problems in schools which often have no science or math equipment, supplies, labs or textbooks; (3) Link the CSU Noyce Scholars Teaching Commons to their local school district user communities, enabling Noyce Scholars to share NSDL teaching resources and pedagogy with teacher colleagues; and (4) Provide Scholars with powerful ePortfolio tools to assist them in communicating how they are able to use NSDL resources to meet the challenges of teaching in high need settings and working effectively with under-achieving students, including English Learners.

Project Activities

In 2008-2009, the Noyce NSDL project will engage more than 100 Noyce Scholars and university math and science faculty in three main activities: (1) creation of a special Noyce Scholars ITC (2) combined on-line and direct delivery professional development for Noyce Scholars and university faculty to build their knowledge and usage of teaching enhancements such as the Virtual Courseware series, and, (3) creating personalized ePortfolios for participating science and math teachers that document teachers' professional development and performance.

Acknowledgments

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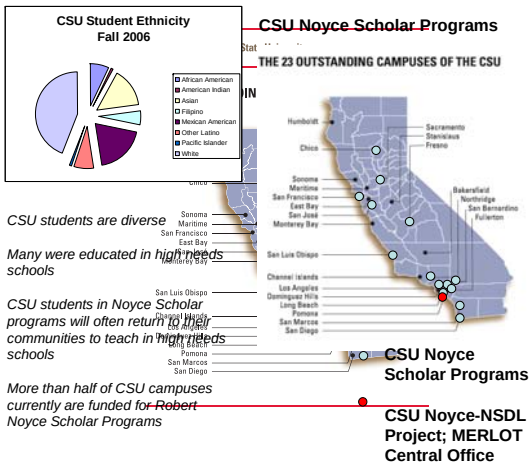
Interested?

If you are interested in being part of this exciting program, please contact Dr. David Andrews, davidan@csufresno.edu.

Noyce Scholar Programs in the CSU



CSU Fresno Noyce Scholars

Working in a high needs school in Fresno, CA.

The Noyce-NSDL Institutional Teaching Commons: Building Teacher Communities

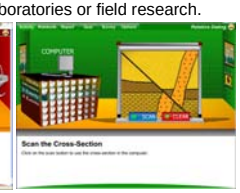
The centerpiece of the Noyce-NSDL Project is creation of a linked series of websites associated with individual Noyce projects (building locally) that function as virtual communities for Noyce scholars, and connect the scholars both to Noyce programs throughout California and the nation, and to the resources and tools provided by the NSDL (link globally). These websites, termed "teaching commons" are fora within which a community of faculty and students exchange ideas, exemplary practices, discuss policy changes, and promote pedagogical innovations for their students. The Noyce community members will enhance the scholarship of teaching and learning through public presentation, creation of educational modules that can be housed in the NSDL, and educational resource review processes. We are working on a prototype of the Noyce Scholars Teaching Commons at http://teachingcommons.cdl.edu/noyce/index.html, modeled after an existing Teaching Commons for Science Education in California http://teachingcommons.cdl.edu/sec/.

Sample Noyce Scholars' "micro-community" Website; a customized portal to NSDL

The National Science Digital Library – a national archive of digital resources (http://www.nsdl.org)

Virtual Courseware

With support from the NSF Instructional Materials Development Program, the Virtual Courseware Project (ScienceCourseware.org) develops web-based activities for secondary school teachers and learners. The software employs a "virtual laboratory" paradigm where students can conduct open-ended experiments that emphasize inquiry, critical-thinking, problem solving, and communication (see below). The VCP is developing an online workshop on using Virtual Courseware that will become part of the Noyce Scholars Teaching Commons. Already a part of many NSDL collections, the CSU-developed VCP will be an important resource for teachers in high-needs schools who do not have ready access to laboratories or field research.



VIRTUAL Fly: Genetics Laboratory VIRTUAL Aquatics: Prey Adaptation VIRTUAL Geology: Relative Age Dating

ePortfolios

ePortfolios are more than just a technology: they Imply a process of planning, keeping track of, making sense of, and sharing evidence of learning and performance. The CSU ePortfolio project will link with the Carnegie Foundation KeepToolKit program. In terms of the benefits to Noyce Scholars, the ePortfolio component of the Noyce-NSDL project will provide a way for science and math teachers to document, support, and continually analyze their ongoing learning experiences as a teacher. The ePortfolios created through the Noyce-NSDL project will be designed to serve as living archives of a teacher's individual professional development, and can be used to document teaching performance and prepare for National Board certification. Shown below is a sample ePortfolio web page.

Summary

The partnerships and activities developed through the Noyce-NSDL project will create electronic communities of mathematics and science teachers dedicated to inquiry-driven education in high needs schools, and provide much needed digital learning modules and enhancements to schools often lacking basic support for laboratories and equipment. In addition, the project will provide substantial benefits to new teachers entering the classroom, through creation of ePortfolios that provide a personalized record and archive of teaching approaches, and documentation of teaching effectiveness.