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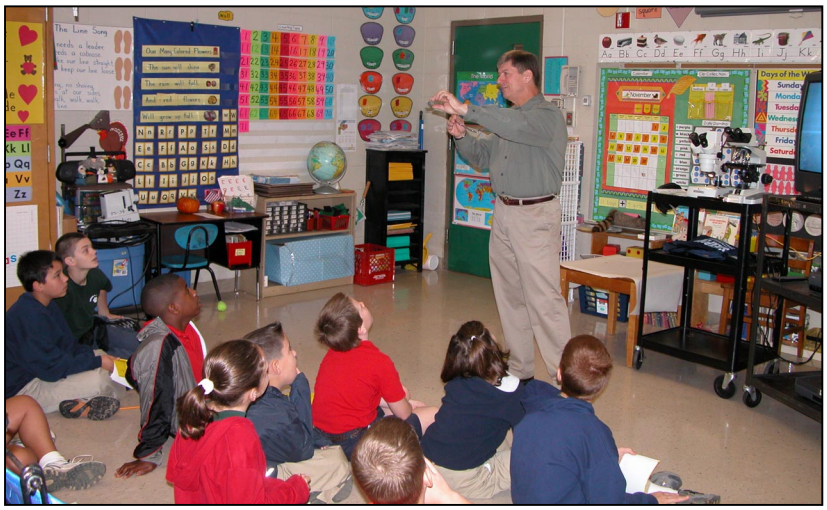
Experimental Program to Stimulate Competitive Research

Wanted: U.S. Citizens to Reverse Threatening Science & Engineering Job Trends

The following is the first of a two-part series to be continued in the January 2005 issue.

The continued growth of U.S. jobs requiring science and engineering proficiency and the continuing decline of citizens training to acquire those skills "threaten the nation's economic welfare and security," according to the National Science Board (NSB), the National Science Foundation's (NSF) governing board.

An NSB report, *An Emerging and Critical Problem of the Science and Engineering Labor Force,* cautions that three things will happen if the trends continue undeterred: 1) the number of jobs requiring science and engineering (S&E) skills will continue growing at a faster rate than the rest of the labor force, 2) the number of citizens prepared to fill S&E positions will, at best, be level; and 3) the availability of foreign-born people with these skills will decline as a result of national security restrictions and increased global competition for their services.



Dr. Gary Glass, University of Louisiana at Lafayette (ULL) Professor of Physics and Director, ULL Louisiana Accelerator Center, speaking to students at Green T. Lindon Elementary School in Youngsville, Louisiana.

Noting that "the U.S. has always depended upon the inventiveness of its people in order to compete in the world marketplace," NSB refers to the preparation of a science and engineering workforce as a "vital arena for national competitiveness," adding that "even if action is taken today to change these trends, the reversal is 10 to 20 years away."

"Initiatives addressing the need to increase the number of Louisiana students, especially minorities and women, opting for a science or engineering career path has been a long-time objective of LA EPSCoR and other Board of Regents' programs," says Dr. Michael Khonsari, LA EPSCoR project director. "In the Regents' Sponsored Programs Division alone, we offer outreach projects through EPSCoR programs funded by five federal agencies, the NSF-funded Louisiana Systemic Initiatives Program, and the Board of Regents Support Fund.

"Each seeks to spark or reinforce student interest in S&E professions and/or motivate teachers to instill creative teaching and research in their classrooms. The goal is an educated workforce in the sciences, engineering and mathematics that will attract industry to Louisiana."

Louisiana Systemic Initiatives Program (LaSIP)

Improved mathematics scores by Louisiana students on the National Assessment of Education Progress (NAEP) are a direct result of LaSIP, which provides professional development and leadership training for middle school teachers statewide to improve the quality of math and science education. Over 7,800 Louisiana teachers have participated and are annually impacting over 350,000 students at 1,300 schools.

Comparing NAEP score data for 4th and 8th graders since the introduction of LaSIP, Dr. Richard D. Anderson, LSU Emeritus Boyd Professor of Mathematics and LaSIP's senior advisor says: "The data clearly shows that from 1992 to 2003 Louisiana has been consistently *narrowing the gap* at both grade levels in mathematics, from 15 to 8 points, a reduction of 47 percent for grade 4, and from 17 to 10 points, a 41 percent reduction, for grade 8. LaSIP and its offshoots were the primary change agents in mathematics during that time frame."

"The LaSIP approach has been based on what the most respected research and, quite frankly, common sense tells us – that enhanced concept-based competencies for teachers is a pivotal key *Continued on page 2*

to elevate students' learning," says Dr. Kerry Davidson, LaSIP project director and the Regents' deputy commissioner for sponsored programs.

LaSIP also administers a U.S. Department of Education-funded program to increase the number of low-income students who enter and succeed in college. It will be featured in the upcoming issue.

NSF EPSCoR

"Summer research programs for college undergraduates, high school students and teachers are components of the current and previous NSF EPSCoR grants – the Center for Biological Modular Microsystems (CBM^2) and the Micro/Nano Technologies Consortium for Advanced Physical Chemical and Biological Sensors, respectively," says Dr. Harold Silverman, LA EPSCoR Committee Chair. "These programs provide participants, many of whom are minorities, with the opportunity to work on research projects with faculty and graduate student mentors in state-of-the-art facilities."

Teachers in one Consortium program were also enrolled in an "Experimental Chemistry for Teachers" class. Another, with a neuroscience concentration, recruited undergraduate and high school students from rural areas. In partnership with two education outreach centers, CBM^2 will offer an annual summer institute for high school teachers that concentrates on planning and delivering high quality science instructional program.

The Consortium created nanotechnology lesson plans for high schools and CBM^2 is planning an interdisciplinary graduate curriculum on micro/nano-fabrication technologies and biomedical applications. Other outreach initiatives include:

- seminars affording students the opportunity to hear, meet and work with nationally and internationally known scientists;
- recruitment seminars for minorities and other underrepresented groups;
- industrial ties to enhance students' academic experience and employment opportunities;
- a web site to interest students in nano-technology;
- opportunities for students to present their research at seminars, fairs and conferences; and
- fellowships leading to advanced S&E degrees.

The LA EPSCoR office, housed at the Board of Regents and funded by NSF EPSCoR, administers additional outreach projects, including:

- a speakers bureau that has sponsored 183 presentations to over 12,000 students, educators and the general public since 2002;
- state and regional conferences featuring poster competitions;
- State Capitol showcases of NSF EPSCoR-funded research projects with exhibits and hands-on demonstrations by students and faculty;
- grant writing workshops for graduate students and faculty; and
- a program that awards funding for S&E faculty, post-doctoral researchers and graduate students to visit and train at national laboratories, research centers or industrial facilities. Argonne and Oak Ridge National Laboratories offer stipends and mentors to guide participants in the completion of research projects related to their academic goals and the laboratory missions. The Argonne program is also open to undergraduate students.

To learn more about LA EPSCoR, visit http://laregents.org; for LaSIP, www.lasip.state.la.us/index,asp.

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