Louisiana EPSCoR
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Experimental Program to Stimulate Competitive Research

Number of U.S. Students Opting for Science & Engineering Decreasing

(The following is the second of a two-part series)

Facts are facts and they don't look good when you compare the continuing increase in the number of U.S. jobs requiring science and engineering (S&E) education with the declining number of citizens training to become scientists and engineers.

Fact: Since 1993, the number of U.S. S&E graduate students has dropped nine percent and is still falling.

Fact: Only 69 percent of the nation's S&E graduates are U.S. citizens.

Fact: African Americans, who represent 12 percent of the U.S. population and 32 percent of Louisiana's, account for only three percent of the S&E workforce.

According to recent National Science Foundation (NSF) studies, the best way to attract and retain undergraduate and graduate students into S&E fields is to involve them in faculty research projects. "The Board of Regents and LA EPSCoR have long subscribed to that idea, finding that student involvement in university research is by far the best way to spark and maintain their interest in science and engineering, says Dr. Michael Khonsari, LA EPSCoR project director. "It's also a great motivator for teachers to instill creative teaching and research in their classrooms."

LA GEAR UP students at Marksville Middle School showing off their LA GEAR UP t-shirts. The back of the shirts say: FUTURE COLLEGE GRADUATE.

In the Regents' Sponsored Programs Division, outreach projects are offered through the Board of Regents Support Fund (BoRSF), the NSF-funded Louisiana Systemic Initiatives Program (LaSIP), and LA EPSCoR programs funded by five federal agencies.

Board of Regents Support Fund

"As one more step toward enhancing the science and engineering 'pipeline' in Louisiana, the Support Fund's Graduate Fellows recipients in sciences, mathematics and engineering are required to work with an elementary and/or secondary school in the sciences, mathematics, and/or engineering fields," says John Wallin, Sponsored Programs' associate commissioner for administration. He adds that:

- Fellowships for Teachers are limited to mathematics and sciences fields. Recipients must commit to teaching at least one semester in Louisiana for every semester they receive the fellowship;
- $2 million Endowed Chairs are limited to six specified areas - all in S&E, all identified in Louisiana's economic development master plan as particularly significant to the State's economy; and
- Research and Development grant recipients hire undergraduate and/or graduate students to work on their projects.

Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP)

Increasing the number of low-income students who enter and succeed in college by bolstering their academic performance and elevating their education aspirations is LA GEAR UP's mission. Funded by the U.S. Department of Education and administered by LaSIP, LA GEAR UP is concentrating on successive student cohorts in targeted middle and high schools in 11 school districts.

"GEAR UP, which each year adds a cohort of 7th graders, will serve over 8,000 7th-9th graders at 43 middle- and high schools in academic year 2004-05 and directly benefit 45,000 students over five years," says Dr. Kerry Davidson, the Regents' deputy commissioner for sponsored programs and principal investigator for LaSIP and LA GEAR UP.

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Dr. Davidson notes that LA GEAR UP focuses on 1) improving the quality of counseling, and mathematics, science, and English language arts instruction; 2) involving parents; and 3) financial assistance and advice. A scholarship program awards recipients college savings accounts that earn interest and state-funded enhancements based on parental income. In 2003, 255 students won a total of $107,500 in individual awards of $1,000, $500 or $250 each.

Louisiana EPSCoR

Besides NSF, which funds both research and the LA EPSCoR office, the Louisiana EPSCoR program coordinates another four EPSCoR federal agency programs. Following are brief highlights of three currently funded programs.

The recently funded **Department of Energy EPSCoR (DOE)** program concentrates on increasing oil and gas discovery and productivity in the Gulf of Mexico with a powerful computing and monitoring system. The University of Louisiana at Lafayette (ULL), the program's lead institution, has eight Ph.D. graduate assistants and 16 first year graduate students participating in its research projects. Summer internships are being made available with industry and national laboratory collaborators, and project investigators are developing professional courses and technical workshops on networking/computing and petroleum-related topics for students, engineers, designers, and developers across the state.

"We are also committed to the mission of developing and improving the participation of underrepresented groups," says Nian-Feng Tzeng, ULL professor of computer engineering and the project's principal investigator. "To this end, we will be partnering with existing university programs aimed at substantially increasing the number of minority students completing degrees in science, technology, engineering and mathematics."

The **Environmental Protection Agency EPSCoR (EPA)** is focusing on enhancing the understanding and predicting the effect of climate change on Louisiana's coastal ecosystems. It offered four two-year $8,000 grants for graduate students from any university in the state to collaborate with high visibility out-of-state scientists.

"The results of one doctoral student investigating microfossils from Catahoula Lake sediment cores will help us predict how vegetation will respond to climate changes currently taking place," says Dr. Michael Dagg, Louisiana Universities Marine Consortium professor and EPA EPSCoR principal investigator. "Two related research projects – one for $10,000, the other, $120,000 – resulted from this study."

He adds that students also participated in a workshop hosted by the program, *Global Change and Coastal Louisiana,* that attracted 50 scientists from North America, Europe and Asia.

National Aeronautics & Space Administration EPSCoR (NASA) affords dozens of undergraduate and graduate students valuable experience each year through participation in research in fields ranging from aviation safety, materials science, and robot-human interfacing for space robotics, to cell viability in simulated microgravity, computer science, and the study of gamma ray sources.

The Louisiana Space Consortium (LaSPACE), the state chapter of the National Space Grant Program, NASA's primary educational outreach program, is a statewide consortium of 27 entities that includes 19 affiliate universities and colleges. LSU physics and astronomy professor John Wefel is the principal investigator of both LA NASA EPSCoR and LaSPACE.

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