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**EXPANDING THE MINORITY PIPELINE:
PROGRAM HELPS TEACHERS LEAD STUDENTS
INTO SCIENCE & ENGINEERING CAREERS**

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Photography Available**

Southeastern universities participating in a program which helps secondary school teachers lead students toward careers in engineering and science have reported a 280 percent increase in minority student enrollment over the past 13 years. That increase translated into a 382 percent jump in minority engineering graduates from 1975 to 1988.

The United States faces a critical shortage of engineering and science talent at a time when the pool of white males -- who have traditionally dominated those careers -- is dwindling. By the year 2000, 70 percent of all new entrants into the job market will be women and minorities, groups which have traditionally not played a large role in science and engineering.

How to meet this challenge has been cause for great concern, but officials of the Southeastern Consortium for Minorities in Engineering (SECME) believe they may have found at least part of the solution.

Based at the Georgia Institute of Technology in Atlanta, SECME promotes hands-on science and mathematics curriculum enrichment and an interdisciplinary approach toward secondary education, explained past executive director Carolyn Chesnut Thorsen. SECME's efforts involve a partnership between the universities, business community, secondary schools -- and parents.

Thorsen outlined the SECME program February 18 at the annual meeting of the American Association for the Advancement of Science in New Orleans.

At predominately-white colleges and universities in the 28-member consortium, minority student enrollment in engineering grew from 848 in 1975 to 4,670 in 1988 -- an increase of 550 percent. Among minority high school seniors graduating from SECME-member school systems, 85 percent indicate plans for attending college, and 45 percent of those say they expect to enroll in science or engineering majors.

Black students from SECME programs report SAT scores nearly 200 points above the average for all black students. One-third of all U.S. black engineers who graduated in 1989 came from SECME member universities.

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"The real key to success is the classroom teacher," Thorsen said. "The teachers are the ones who academically prepare students. If the classroom teachers can relate the curriculum instruction to careers in math and science, they can be very effective guidance counselors."

One example in the SECME curriculum is a mathematics lesson called "How to Get the Most out of Your Nine-Speed Bike." Students examine a 10-speed bicycle and by counting the teeth on gears, calculate the gear ratios. In one example, they find that two of the ratios are the same -- meaning the 10-speed really has only nine speeds.

"The students see how math is used in the real world all around them," Thorsen suggested. "You can then put them to work figuring out how to change the ratios to make a better bike and you have turned your classroom of 8th or 9th graders into budding engineers. This gives an idea different from most people's stereotype of an engineer."

Classroom activities may be supplemented by visits to participating companies, where students see scientists and engineers at work. Engineers also visit the schools, serving as role models and answering questions about careers.

SECME promotes interdisciplinary work, particularly involving language arts and communications skills. After students calculate gear ratios in their math class, for instance, they may write about their experience in a language arts class.

"Everybody hates to write an essay, but it's much less painful if you have just solved a problem and are excited about it," she said.

Making classroom science and math instruction more effective benefits all students -- not just minority students, Thorsen noted. After beginning a SECME program, one rural Georgia school system sent 11 engineering students to Georgia Tech in a single year -- remarkable because in previous years it had contributed only one other student.

Other programs aimed at expanding the pipeline of minority engineers tend to focus on individual students. SECME aims at teachers, Thorsen explained, because teachers can make a long-term impact on the educational system.

"If you can get the teachers to start doing some things differently, you have made an investment that will be in the classroom for a long time," she said. "You don't have to start all over again each year when students graduate."

SECME receives funding from several sources, including corporate contributions, the Carnegie Foundation and the National Science Foundation. Nearly 250 school systems in eight Southeastern states participate, but Thorsen believes the program is reaching only a fraction of the students who could benefit from it.

She believes the program could work anywhere -- as long as there is a commitment from the universities, business community and secondary schools.

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