Where the girls aren't

By CHRISTINA DYRNESS, Staff Writer

At the Wade Edwards Learning Lab in Raleigh, Katie Fraser stands in front of her group -- six teenage boys and girls who started their first year at Broughton High School on Monday -- and points to a chart she has designed to illustrate thinking outside the box. It would be hard to guess that the articulate instructor was in their position just a year ago. A rising sophomore, Katie is at home in the computer lab.

But the 15-year-old is not readying herself for a career in computer science -- or in any area of technology.

"I look at computer science and associate it more with men," Katie says. "My ultimate dream is to go to law school. Computers don't really interest me in the sense of science."

At a time when girls are just as well-versed as boys in designing Web pages, instant messaging and building PowerPoint presentations, Katie's attitude would be surprising, if it weren't so common.

In March, hundreds of middle-school girls filed into an auditorium on the N.C. State University campus for a crash course in women in science, technology and engineering. Alexandra Khorram, 13, an eighth-grader at Ravenscroft, attended the program. She says now she remembers the chemical engineering workshop, the one where they tested diaper absorption rates, the best. "I learned a lot about what jobs there are out there for women," Khorram said.

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Mission accomplished? For more than a decade, educators and others have tried a variety of programs -- summer camps, workshops and mentoring -- to encourage
girls to take classes and consider careers in math, science and computers. At N.C. State University, for example, in 1984, 12,066 women received bachelor's degrees in computer science. In 1996, 6,772 women did. Computer science is one of the few college majors that has seen a decline in female majors since the 1970s.

Now some researchers at N.C. State are trying to figure out whether those programs actually make a difference. Using a summer day-camp program they designed called Girls on Track, they are studying whether middle-school girls exposed to the wonders of science, math and technology will actually stick with these subjects as they grow up.

There's a certain amount of urgency involved. With half the population less apt to pursue technology-oriented careers, it's more than an equality issue -- it's an international competitiveness issue.

"The country would be better off in the sense of not having to import work force from overseas or outsourcing work overseas," says Mladen Vouk, a professor of computer science at N.C. State and one of the principals in the study. "I'm hopeful that things are going to get better. The gap is narrowing; it's just taking a longer time."

In addition to cutting the potential technical work force in half, women who steer clear of technical fields, often because they are turned off by math and science in high school, can install their own glass ceiling by ruling out some very lucrative jobs.

"If women take two university math courses, their salary goes from 70 percent to 90 percent of what men make," says Sarah Berenson, a math education professor and director of N.C. State's Math and Science Research and Development Center.

Vouk, Berenson, and Joan Michael, a psychology professor at N.C. State, were awarded a $500,000 grant this summer from the National Science Foundation to continue their study on this topic. The money will allow the researchers to continue to follow the girls who have participated in the four years of Girls on Track summer camps through their high school and early college careers to see whether they continue to succeed in math and science.

They hope the research can help change a troubling trend. Women make up fewer than 28 percent of the computer science college graduates and less than 20 percent of the technical work force.

Keeping the girls

Recent statistics show these numbers might be improving slightly, but those concerned are out to change the prevailing notion -- and the one held by Katie Fraser -- that technology, science and math are male domains.

Pat Selinger, who works at IBM's headquarters in Armonk, N.Y., is outspoken on this topic and insists that mentoring is key. During her 27-year career at IBM, she worked her way up to vice president of data management architecture and is one of six female IBM Fellows -- a designation given to an elite group of 55 technologists within the company.

Selinger got her bachelor's degree in computer science at Harvard in 1971 after starting out as an English major. It was a time when computers were new, there was an atmosphere of empowerment for women and fewer stereotypes in the field. Now, she's frustrated by what she sees.

"I'm tired of not having lines in the ladies' room!" Selinger says. "It's uncomfortable to always be in a room full of men. I was at a server conference
recently and I looked around the audience and there were maybe two, three or four women out of the hundreds that were there. We've got to do better than that!"

With 13,000 employees in the Triangle, computer giant IBM has made it a priority to interest girls in technology and mentor young women just getting started in the technology field. Big Blue has invested millions of dollars in developing an online community for mentors, teachers, students and techies to communicate with and teach one another.

Last month, IBM held its third annual EXITE (it stand for Exploring Interests in Technology and Engineering) Camp at its campus, serving as host to 30 girls from Wake and Durham County public schools for a week that included experimentation with circuit boards, Web pages and building a PC.

Jenny Fitzgerald, a 24-year IBMer and manager of an internal career center, watched the girls' interest levels rise as the week went on. "The girls weren't all that excited about being there in the beginning," Fitzgerald said. "But by the end of the day they didn't want to leave."

Like others who are passionate enough about girls in technology to spend weeks at day camp, Fitzgerald is effusive about the girls' talent and accomplishments. But Fitzgerald, a former programmer with a lifelong love of math, knows there's a chance the week won't have had a lasting effect.

But it might. "Something might have occurred that week that these girls will never forget."

For the first time, IBM is matching up its EXITE campers with IBM-employee mentors to keep in touch with them through the next school year -- both online through a specially designed Web interface called Learning Village and in person -- in another effort to extend the experience.

Self-selecting?

Virginia "Ginny" Marie Shepherd is, so far, a success story. An eager participant in Girls on Track and the Mathematics and Science Education Network (or MSEN), a pre-college program also run through N.C. State, Shepherd plans to pursue a technical career -- perhaps in architecture.

"I've always been good in math. That's always been my strong area," says 13-year-old Ginny, one leg folded under her on a big chair, hands fidgeting.

Her parents, Thomas and JoAnn, sit across from her on the couch in their cozy North Raleigh living room, making jokes about how they're counting on Ginny to support them in their old age.

"She said to me the other day, 'Mom, just get me through college and I'll be fine,'" JoAnn Shepherd says. "She's self-disciplined. We just want her to go as far as she could go."

The three of them do a lot together, and during the school year, when she'll be an eighth-grader at Carnage Middle School, the Shepherds will take an active role in Ginny's schooling.

Girls such as Ginny often end up in Girls on Track, but those less likely to end up there might have more of an effect on the study.

Participants in the program aren't necessarily the girls who need to be exposed to science, math and technology at the crucial middle-school age.

"It tends to be a self-selecting group," Vouk says. "Their parents are supportive, their counselors are supportive. So you reach the girls that really want to do it anyway."
The question still to be answered -- the oldest girls they've been following as part of the study are seniors in high school -- is whether the flame continues to burn in these girls in college, where a high percentage of female computer science or engineering majors leave the field before graduation.

And then there are the girls such as Katie Fraser, who despite their technological talent have never participated in a summer camp program or attended a science workshop.

Girls who, as Katie says, have "grown up with access to computers at home and access to the Internet," who take computers for granted and still have no desire to have a wired career.

For understanding, Vouk and Berenson look abroad, where the gender gap is not nearly as wide.

In Germany, for example, Vouk says, there's not much of a gap between the number of male and female engineers. "So it seems to be a training or social issue, not something that's inherent to the psyche of a woman," Vouk says. Berenson agrees. "Perhaps we need to take a look at the courses. What would it look like if women had designed the computer science curriculum? The more male the culture becomes, the more male it becomes."

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