

## EDUCATION WEEK

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### Science Camp: Just for the Girls



Sixteen-year-old Amanda Kline, center, and Manisha Tiwari, 15, cheer as they successfully propel their rubberband-powered car across the table. The students took part in a summer science camp for girls sponsored by the University of North Texas, one of a growing number of such camps across the country geared specifically to their gender.

—Christopher Powers/Education Week

**Academic camps are on the rise across the country, including ones to get adolescent girls excited about the exploration of science.**

By **Sean Cavanagh**

*Dallas*

Two teenage girls amble to the front of the room and unveil their creation: a miniature tower, built with wooden sticks and duct tape, bare hands and imagination.

It's the moment of truth.

They've spent the better part of an afternoon constructing an 18-inch-tall model of a high-rise. In a few seconds, the same camp director who challenged them to build it will switch on a fan to see if he can blow it down.

For Marcia Thomas and Alexandra Cooks, like the other young women here, it's the sort of challenge they relish. They have gathered on a campus of the University of North Texas for a summer science camp set up specifically for girls, one of a growing number of such camps around the country.

Many of the camps are being promoted by universities like UNT and organizations that are trying to encourage female students to develop an interest in science and mathematics, despite pressures that, like wind pushing against a makeshift tower, threaten to topple their enthusiasm.

"People think the ideal girl is a cosmetologist or a designer," said Ms. Thomas, 14, during a break from camp activities. "They think that a girl can't be a scientist or an engineer. I always wanted to be a scientist. I've always liked it, ever since I was little."

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Educators and political leaders nationwide are keenly interested in encouraging more girls to show similar resolve, in the hope that they will eventually pursue advanced studies and careers in science- and math-related fields.

It's not easy. Research shows that girls tend to lose interest in science and math as they move through the education pipeline—a retreat that often begins during middle school.

Summer science camps can be part of reversing that trend, some say. The American Camp Association, a nonprofit accrediting organization in Indiana, estimates that the number of academic camps for girls has risen by about 140 percent, to 58, since 1998. Overall, the number of academic camps is growing. Still, they represent only a small proportion, or 10 percent of the roughly 2,500 camps accredited nationwide by the association, which estimates that it works with about one-quarter of the camps around the country.

Officials at UNT, which is based in the north Dallas suburb of Denton, staged their first science camp for girls two years ago, organizing it around robotics, a topic they believe research suggests can attract new female students to science and engineering.

This summer UNT officials added a three-day camp called “Eng-inuity!” devoted to design and engineering, which Ms. Thomas and Ms. Cooks attended. The camp was held July 18-20 on the university's campus in south Dallas, a mostly working-class area. UNT sought to recruit campers from the surrounding community, including minority girls from neighborhoods in that part of the city.

David M. Keathly, a lecturer and adviser in UNT's computer science and engineering department who helps run the camps, believes that science and math, when made fun through relevant activities and projects, can appeal to young women—a belief shared by many experts and advocates.

“What engages girls is the hands-on aspect of learning,” Mr. Keathly said, “some kind of action, something tangible that they see in everyday life.” The activities at UNT's camps, he added, often result in creating “a product, something they can show other people.”

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The decision to limit UNT'S camps to girls was based on Mr. Keathly and other university officials' observations while hosting a competition for BEST, the Dallas-based nonprofit officially known as Boosting Engineering, Science, and Technology, on their campus in 2005.

UNT officials noticed that among the participating teams of students, girls were often relegated to marketing and promoting their groups' creations, while boys performed the “get-your-hands dirty” activities, Mr. Keathly recalled. UNT faculty wondered whether girls might respond differently to science when boys were out of the picture.

That strategy tends to pay off for many reasons, said Kate L. Pickle, a program manager who oversees math- and science-related topics for the Girls Scouts of the USA. Boys tend to be more vocal in group science settings, she noted, causing some girls to lose confidence in their abilities. Other girls don't want to appear to be smarter than their male counterparts, she added.

The Girl Scouts, which stage summer camps and other activities, have a strong interest in promoting math and science. About 40 percent of the recognitions, or badges, the 2.7 million-member organization makes available to its participants are related to math or science, Ms. Pickle estimates, and interest in those areas is increasing.

“We know that girls learn best through cooperative learning and hands-on learning,” Ms. Pickle said. “We found that when we get them into an all-girl setting, they thrive.”

but that girls tend to fall behind in science by around middle school. Some studies have also shown that girls' interest and confidence in math and science wanes as they near the end of high school, in contrast to boys'.

Many experts believe that teachers, counselors, and parents subtly, or even directly, discourage girls from taking math and science subjects seriously, while boys receive the opposite message. Counselors say girls are put off by the competitiveness of boys in classes.

"My friends and I believe guys try to rule everything," said Danielle Puente, a 15-year-old at camp. That behavior, she added, won't discourage her. "I love being challenged physically and mentally—especially mentally," she said. "It shows I'm smart. I like to prove it."

Several of the girls attending the camp say the pressure to avoid math and science more often comes from their female classmates.

"Girls say, 'Why are you taking that?'" Ms. Thomas, working at a table on a camp project, says of girls challenging math and science classes. "They would say, 'Oh, all you want to do is learn. You don't have a social life.'"

Jessica Hayden, 22, remembers hearing similar remarks. The UNT graduating senior, who was working as a camp counselor, remembers getting teased by boys during science classes until high school. But as she moved into more-demanding courses, she noticed that much of the teasing stopped.

"If you can stand up to that peer pressure, you can get through," said Ms. Hayden, who will be a computer applications developer for Neiman Marcus after graduating this month.

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Camp leaders purposely chose women to work as camp counselors, in the hope of presenting them as role models, Mr. Keathly said. The directors of UNT summer camps, who also include Robert Keathly, an assistant professor of computer science and engineering at the university, typically do not focus on gender stereotypes in science and math during their camps, Mr. Keathly said. They do, however, discuss what makes careers in those fields exciting, he added.

As it now stands, many girls are put off by the false perception that science careers require boring, isolated work, with little opportunity for interacting with others, camp officials say.

"It's not every girl's dream job," said Mitra Mahdavian, 22, another counselor and UNT student. "It doesn't fit [girls'] definition of how they will live their lives when they're older—sitting behind a computer, or in a lab, or wearing a builder's hat."

UNT officials try to demystify those careers by explaining science and engineering work in plain language.

"What's design?" Mr. Keathly asks the campers at the beginning of one session. Gradually, he gets a response: It's an idea that you or someone else came up with, which can later be tested. To follow a process, says the teacher, who worked for 20 years in research and development for contractors and other industries. They brainstorm ideas, design projects, build them, test them, redesign them, and share solutions. And another thing, he says: They fail.

"In failure, we learn," Mr. Keathly says. "We tinker, we fail, we learn, we improve."

Working as a pair, Ms. Thomas and Ms. Cooks cope with setbacks. Their first assignment is to build a miniature car out of cardboard, wooden sticks, and other simple materials, powered by the tension of rubber bands. But the wheels produce too much friction, and they spent most of the first day

The biggest challenge of the first day, however, is building the stationary high-rise. Mr. Keathly tells all the groups, needs to be strong enough to remain standing and ball propped atop as the fan blows against it.

Ms. Thomas and Ms. Cooks have built a tall, conical tower supported by wooden sticks; they have stacked folded paper baskets they call “dream catchers” to reach the required height. The tennis ball sits inside the top dream catcher.

Mr. Keathly, who has propped the fan on the table, turns it on low, and it begins to blow power—what he calls “wimpy Aggie thunderstorm” level. The girls’ tower stands firm. He switches the fan’s switch to medium, or “full Texas thunderstorm” power, as he calls it. It does not move.

Finally, he sets the fan on high power—“full-force hurricane.” Ms. Thomas and Ms. Cooks shift nervously on their feet, but the tower stays in place.

Other groups are not so lucky. One tower makes it through two levels, then crashes. Another makes it to the same point, then begins to slide horizontally, undone by a gust.

Some of the girls have design questions. Weren’t they supposed to all make their towers out of paper, rather than heavier sticks and cardboard, one asks? Mr. Keathly, though, is not concerned with those details at this point. What he wants is for the girls to enjoy the process, and to talk about their designs.

“All the famous architects defied conventional wisdom,” Mr. Keathly tells the girls. “They were rebels.”

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