It would be hard to find a student at Stone Bridge High School who has never used the Internet for a research assignment, socialized with Facebook or played a video game.

But few know much about how computers and the Web actually work.

About 70 students at the Ashburn school are taking introductory or Advanced Placement courses this year in computer science, getting a glimpse behind the games and Web sites they use all the time.

For an hour and a half every other day, they enter a bracket-and-parentheses-laced world and practice speaking and writing in Java and C++. If they stick with it, they will be part of an elite group that is exceedingly employable, economists say, even in a recession.

In Loudoun County, sometimes called the Silicon Valley of the East, fewer than 5 percent of all high school students took a computer science class in each of the past three years, and the numbers are slipping slightly.

Nationally, the portion of schools that offer an introductory computer science course has dropped from 78 percent in 2005 to 65 percent this year, and the corresponding decline in AP courses went from 40 to 27 percent, according to a survey by the Computer Science Teachers Association.

In the spring, the College Board, citing declining enrollment, canceled its AP computer science AB class, the more rigorous of its two courses in the subject.

The result of sporadic or skimpy computer science training is that a generation of teenagers great at using computers will be unlikely to play a role in the way computer technology shapes lives in the future, said Chris Stephenson, executive director of the New York-based Computer Science Teachers Association.

"Their knowledge of technology is very broad but very shallow," she said.

That has economic implications. "If you look at history, the nations with economic superiority are building the tools the rest of the world is using," Stephenson said.

The slide in computer science education is surprising at a time when politicians are bent on fueling innovation by sharpening the math, science and technology skills of the future workforce.

Stephenson said computer science classes might be an unintentional casualty in the push to increase academic standards. Computer science is not considered a core subject by the No Child Left Behind law, which influences school priorities and budgets.

That makes them vulnerable to cuts, and computer science teachers are often reassigned to teach core
math or science classes. As states increase high school graduation requirements in core subjects, students have less time for electives.

Some states, including Virginia, have tried to increase enrollment in computer science classes by allowing them to count as math credits. In Maryland, some school systems will count a computer science class toward a technology or math requirement. The District offers career and technical education credits for some computer science courses.

Many schools in the Washington area offer at least one computer science course. The number of students who take an AP computer science course has been small but steadily increasing in Virginia and Maryland.

Computer industry leaders and policymakers are trying to raise awareness about the field. This fall, the House of Representatives passed a resolution creating Computer Science Education Week, which began Dec. 6.

John R. White, chief executive of the Association for Computing Machinery, marked the occasion with a YouTube video that explains why the number of jobs for software engineers and network systems analysts is growing fast.

"Computing is fueling countless advances, from improving communications and advancing health care to protecting national security and improving energy efficiency to helping understand the depths of the universe," White said.

At Stone Bridge, half a dozen teenage boys in dark, hooded sweat shirts sat in a row along a wall last week, illuminated by six white computer screens filled with code. Their task was to create a "high/low" game by programming the computer to guess a number between one and 100 with the fewest possible guesses.

The teacher advised them to use a "binary search strategy." Many of the students were having trouble, but they asked each other for help and tried different approaches.

Teacher Ann Blocksom said she has a lot of "bright bunnies" in her fast-moving AP class. She sometimes visits math classes to encourage more students to sign up for computer science, and this year she plans to send letters to promising candidates, she said. Many students don't understand what computer science is or what they can do with it, she said.

Parham Ghazanfari, 16, one of the teens in the class, said he wants to study computer science so he can build video games. He started teaching himself programming skills in eighth grade but has not learned to program the graphics he needs for games. He might need to study more advanced math, he said, "vector math with matrices and stuff."

Shanice Proctor, 16, one of two girls in the class, said she signed up for AP computer science because she thought it would help her "think on a higher level."

She also likes the immediacy of computer science: "Algebra has been around for a long time. This field is actually changing. It's new... That makes it cool."

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