

WORKFORCE DEVELOPMENT

Growing STEM skills

Local agencies, educators and businesses focus on attracting more students to science, technology, engineering and math to feed the workforce

BY JODIE GILMORE | for the VBJ

The good news: 10,500 jobs in Clark County use science, technology, engineering and math (STEM) skills, and it is likely 400 new positions will open up each year for the next decade that use these skills, said Scott Bailey, regional economist for the Washington Employment Security Department.

The bad news: high-tech companies fear a dearth of qualified candidates to fill these new positions.

"You can't underestimate how important these skills are."

—Lee Cheatham, Washington Technology Center

Consider this:

- United States students' science literacy is below the industrialized country average.
 - The Computing Research Association reported that enrollment in undergraduate degree computer science programs is less than half what it was five years ago.
 - In 2007, the U.S. produced only 70,000 engineering graduates – 86 percent less than China's 500,000, according to the National Academy of Sciences.
 - A recent national study of 11- to 13-year-old students indicated that 84 percent would rather eat vegetables, clean their rooms or visit the dentist than do math.
- "We don't see enough students going into higher education in the math and science fields,"

said Doug Anderson, operations manager at Underwriters Laboratories Inc. in Camas.

Mapping a course

In 2004, Scott Keeney, president and chief executive officer of Vancouver-based nLIGHT Photonics, founded the Mentoring Advanced Programs for Students to help address this problem.

It connects students with mentors from local high-tech firms who show students the importance of STEM skills and enhance their proficiency using real-life applications.

Many MAPS mentors come from members of the Clark County High-Tech Council, a CEO-level association of local technology businesses.

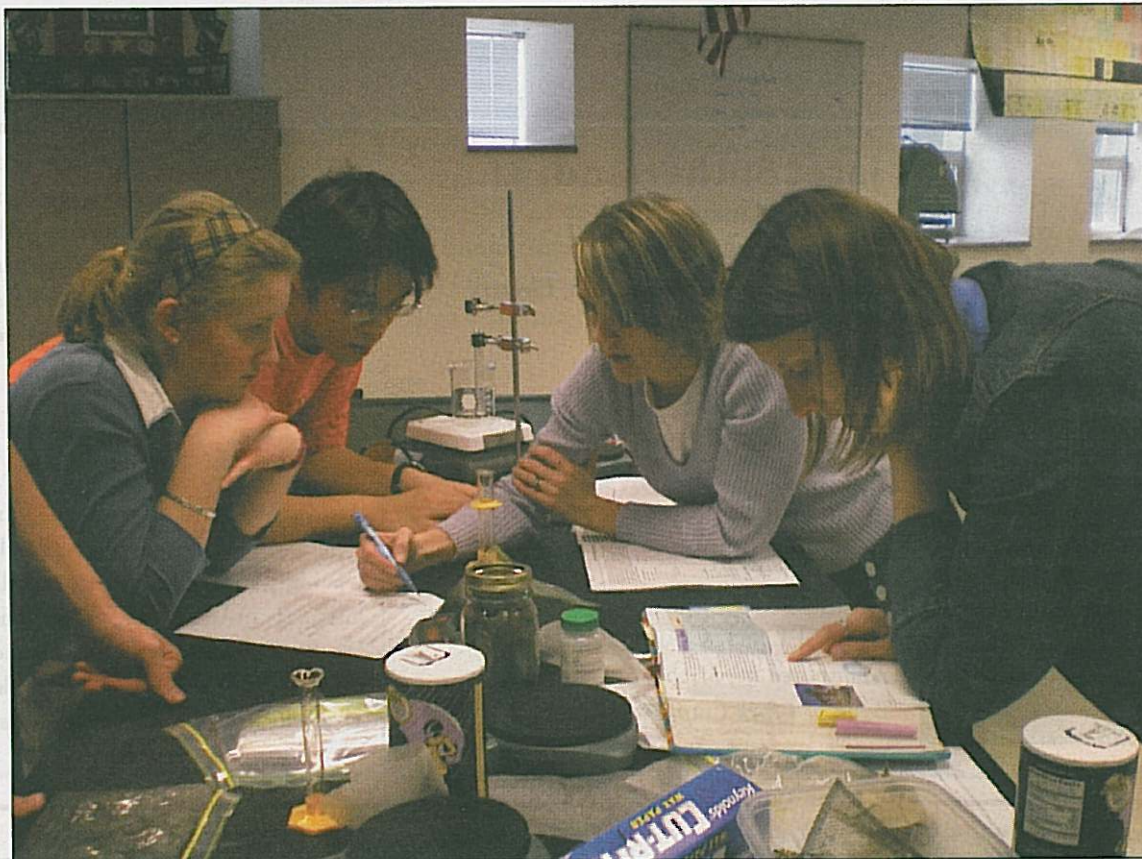
"Local production of (STEM) workers is a No. 1 priority for these companies," said Bart Phillips, president of the Columbia River Economic Development Council.

The companies want to recruit locally because local talent tends to have less turnover, he said.

The organization began with a single mentoring subject – physics – and a single mentor company – nLight. In the ensuing four years, the mentored subjects grew to include nine STEM and non-STEM subjects, while the number of participating companies has increased to 20.

"The strong growth of the program illustrates how much the business community believes in it," Anderson said.

But starting this year, MAPS turned its focus solely to STEM subjects and expanded to provide mentors for students in non-Advanced Placement



Submitted photo

A group of Mentoring Advanced Programs for Students participants and their mentor and teacher work on chemistry equations. This year, MAPS expanded its focus.

classes, said Program Manager Natalie Pacholl.

Other plans include:

- Providing more support for STEM teachers.
- Creating "externships" for STEM teachers, in which they can work with a high-tech firm during the summer.
- Increasing the number of company tours, internships and job shadow opportunities for students.

"It's important for students to see what's out there – to see employees in the real job market and meet employees with a wide variety of educational backgrounds," Pacholl said.

The program's mission is now to expand the number

of Northwest students who succeed in STEM subjects and prepare them to become future leaders and innovators in the global economy.

Hook 'em young

The Southwest Washington Workforce Development Council, together with Clark College, commissioned a "STEM Scan" to inventory existing STEM-related programs in Southwest Washington and identify gaps that need to be addressed. One key finding of the August report was that "grades 5-10 are key years for truly engaging students in STEM courses and careers."

"We need to work lower down the pipeline, in middle school," said Brandi Stewart-Wood, SWWDC's director of strategic initiatives. "We need to get them excited about STEM subjects."

Recognizing this, Clark College added an elementary-school level section to its annual Science Olympiad this year.

"The Science Olympiad program provides students with a variety of highly engaging activities that naturally generate enthusiasm for scientific exploration," said Barbara Kerr, executive director of communications and marketing at Clark College.

Dick Lang, associate professor of computer science at Washington State University Vancouver, said the number of calculus-ready students coming in as freshman is quite low.

One contributing factor is that as early as seventh or eighth grade, students are usually put on a particular math track – and students and teachers may not understand the long-term consequences of that seemingly innocuous decision.

“Students who are not in the top math track have basically opted out of an electrical engineering or computer science degree” – unless they want to add a year or more to their college stay to bring their math skills up to the necessary level, Lang said.

Establishing connections

The STEM Scan also revealed that all STEM programs struggle with similar issues, such as engaging students, developing interesting curriculum and establishing better career connections. To address these problems, the SWWDC and Clark College will host a STEM Summit Dec. 10.

“We want to raise students’ awareness of these programs, connect more businesses with schools and maximize the use of business investment,” said Stewart-Wood.

It is vital for students to recognize that STEM skills are important for a broad spectrum

of careers – not just those headed for white lab coats, she said. Jobs are increasingly complicated and STEM skills are necessary in a wide array of occupations.

Lee Cheatham, executive director of the Washington Technology Center, agreed.

“STEM skills are not just for baccalaureate degrees, but for skilled trades, too,” he said. “You can’t underestimate how important these skills are.”

With programs like MAPS, Southwest Washington is



Submitted photo

Two MAPS students prepare to enter the clean room at Vancouver-based nLight Photonics.

working on growing a local STEM-savvy workforce.

“At the national level, there is a lot of scary data,” Pacholl said. “But at the local level, we have a fantastic opportunity because we have so many great high-tech companies.”

Higher ed raises the bar

Dick Lang, associate professor of computer science at Washington State University Vancouver, spent 25 years in private industry before coming to teach at the university nine years ago. He recalled his frustration working at WaferTech when it came to Camas.

This program is expected to feed a local talent pool to fill the region’s engineering needs.

WSUV also is beefing up its STEM infrastructure, working with the Washington Technology Center to build both a semiconductor user facility and an applied technology classroom.

The user facility – essentially a semiconductor “clean room” – will be modeled after the highly successful microfabrication lab operated by the WTC in Seattle. There, faculty researchers, students and high-tech companies work together to foster innovation.

The design process of the user facility is almost complete, said WTC Executive Director Lee Cheatham.

The construction of the project will require about \$55 million, which may be approved during the 2009 legislative session. If the funding is secured, Cheatham said the facility ought to be completed in 2011.

Bart Phillips, president of the Columbia River Economic Development Council, is

excited about the possibility of having such a facility located in Vancouver.

“Ours is the only technology center that grew up in the absence of a research center,” he said, comparing the Vancouver area to places like Silicon Valley, Seattle and Boston. “Our goal is to get the research capacity here.”

Clark College also is planning a new building that will devote 70,000 square feet to science, technology and math.

Like Clark’s building at Columbia Tech Center, the STEM building will incorporate opportunities for students to work with technology such as wind turbines and solar panels.

George Reese, Clark College’s director of instructional programming and innovation, said the college expects to receive funding for the building in 2011 and occupy it in 2013.

“Our decision to make STEM the focus of the new building reflects our recognition that science, math, and technology are going to be vital for the economic health of this community,” Reese said.