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TEACHER'S AIDE

High Schools Add Classes Scripted by Corporations

Lockheed, Intel Fund Engineering Courses; Creating a Work Force

 By ANNE MARIE CHAKER
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In a recent class at Abraham Clark High School in Roselle, N.J., business teacher Barbara Govahn distributed glossy classroom materials that invited students to think about what they want to be when they grow up. Eighteen career paths were profiled, including a writer, a magician, a town mayor -- and five employees from accounting giant Deloitte LLP.



"Consider a career you may never have imagined," the book suggests. "Working as a professional auditor."


The curriculum, provided free to the public school by a nonprofit arm of Deloitte, aims to persuade students to join the company's ranks. One 18-year-old senior in Ms. Govahn's class, Hipolito Rivera, says the company-sponsored lesson drove home how professionals in all fields need accountants. "They make it sound pretty good," he says.

Deloitte and other corporations are reaching out to classrooms -- drafting curricula while also conveying the benefits of working for the sponsor companies. Hoping to create a pipeline of workers far into the future, these corporations furnish free lesson plans and may also underwrite classroom materials, computers or training seminars for teachers.

The programs represent a new dimension of the business world's influence in public schools. Companies such as McDonald's Corp. and Yum Brands Inc.'s Pizza Hut have long attempted to use school promotions to turn students into customers. The latest initiatives would turn them into employees.

Companies that employ engineers, fearful of a coming labor shortage, are at the movement's forefront. **Lockheed Martin** Corp. began funding engineering courses two years ago at schools near its aircraft testing and development site in Palmdale, Calif., saying it hopes to replenish its local work force. Starting in 2004, British engine-maker **Rolls-Royce PLC** has helped fund high-school courses in topics such as engine propulsion. **Intel** Corp. supports curricula in school districts where engineering concepts are

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taught as early as the elementary level.

HIGH SCHOOL INC.

- **The News:** Corporations such as Lockheed and Deloitte are helping to write curricula for public-school courses.
- **The Background:** Fearing a worker shortage, especially in the engineering field, the companies are seeking ways to bolster their own work forces.
- **The Debate:** While schools welcome the materials, critics say the initiatives add a commercial agenda to academics.

Schools, for their part, have embraced corporate support as state education funding has remained flat for a decade and declining housing values now threaten to eat into property-tax revenues. Teachers, meanwhile, often welcome the lesson plans, classroom equipment and the corporate-sponsored professional development sessions.

But however well-intentioned, such corporate input may blur the line between pure academics and a commercial agenda, critics say. "When you have a corporation or any special

interest offering an incentive, you are distorting the educational purpose of the schools," says Alex Molnar, an education-policy professor at Arizona State University who directs the school's Commercialism in Education Research Unit.

Schools Should Decide

The hiring priorities of a company or industry, Mr. Molnar says, can change quickly. On the other hand, he says, schools should provide a broad and consistent foundation of knowledge and skills. Deciding what to teach is "first and foremost, a series of choices," he says. Historically, those choices have been made by school officials and professional educators, based on the interests of their community's children, not on the shifting needs of industry.

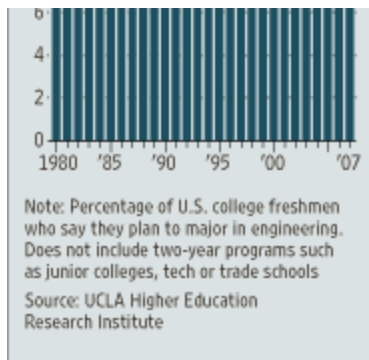
Nonetheless, many school officials are receptive. Tamika Bauknight, the Roselle district's director of curriculum and instruction, concedes that corporate self-interest is at work in the curriculum provided by Deloitte, whose career-choice materials include profiles of the company's chairman of the board and an audit manager. But she believes students benefit. "If through the curriculum they consider becoming an accountant and thinking about Deloitte," she says, "that isn't a bad thing."

Businesses have sought to shape public-school lessons before, but past initiatives focused more on teaching trades. In the early 20th century, companies fostered industrial education in high schools to feed their factory needs. More recently, **Cisco Systems Inc.** has offered information-technology certification to students who learn computer-networking skills. Now, by contrast, companies are seeking to start training students for professions that often require university degrees.

Robotics for Middle Schoolers

One of corporate-sponsored curricula's largest conduits into U.S. classrooms is Project Lead the Way, a nonprofit organization based in Clifton Park, N.Y., that develops engineering coursework used in more than 2,000 schools nationwide. For high schools, it offers eight full-year engineering courses, including digital electronics and civil engineering. It also provides five 10-week units for middle schools on topics such as robotics.

Project Lead the Way was formed 10 years ago with an initial \$1.5 million grant from a foundation run by Richard Liebich, chief executive of a tool-manufacturing company based in Orchard Park, N.Y. Mr. Liebich said he could never find enough engineers to hire, and envisioned an entity that could help by creating engineering courses for pre-college students. The group's curriculum is technical, with no textbooks. Open-ended questions and problems encourage students to be creative, the organization says.



Project Lead the Way says its courses are offered as electives, and aren't meant to supplant core subjects typically taught in school.

"What these companies bring is contemporary expertise that can sometimes be insulated in a purely academic environment," says Niel Tebbano, Lead the Way's vice president of operations. With a traditional, theoretical approach to math or sciences, he says, "you get the young people asking, 'Why do I need to learn this?'" The lack of real-world application for this knowledge, he says, "has been the albatross around

public education's neck."

The group concedes that companies may contribute to the nonprofit to ensure their own interests are reflected in lessons. The National Fluid Power Association, an industry trade group based in Milwaukee, Wis., paid the group \$100,000 to hire fluid-power experts to ensure that concepts on hydraulics and pneumatics would be incorporated into the courses.

In another case, a senior engineer in the Indianapolis-based unit of engine maker Rolls-Royce, which had been funding Project Lead the Way courses in a handful of local schools, noticed what he considered a lack of material on propulsion. So he helped write a new lesson for the project's aerospace course. Now, the class has an optional six-day "Introduction to Propulsion" unit that includes a PowerPoint presentation on a gas turbine engine "by kind permission of Rolls Royce."

That same aerospace course is scheduled for revision again, and this time Lockheed Martin is contributing \$146,000 to have a say in the new version. A presentation shown to company executives outlining Lockheed's educational efforts specifies that "increasing general interest in math and science for all students" is "not our goal." Nudging students toward Lockheed, the presentation says, is.

Lockheed is bracing for a worker shortage. The company estimates that about half of its science- and engineering-based work force will be retiring in the next decade or so. Meanwhile, interest in engineering as a career is declining among U.S. students. In a 2007 survey of more than 270,000 college freshmen conducted by the Higher Education Research Institute at UCLA, 7.5% said they intended to major in engineering -- the lowest level since the 1970s. National-security restrictions preclude the Bethesda, Md., company and other major defense contractors from outsourcing many jobs overseas.

"We're already within the window of criticality to get tomorrow's engineers in the classroom today," says Jim Knotts, director of corporate citizenship for Lockheed. "We want to address a national need to develop the next generation of engineers -- but with some affinity toward Lockheed Martin."

Lockheed is particularly eager to refresh the engineer pool at its giant facility in Palmdale, Calif. Here, at the southern edge of the Mojave Desert, the company works alongside aerospace giants Boeing Co. and Northrop Grumman Corp., designing aircraft and testing them near an Air Force facility known as Plant 42. Luring workers to this flat, parched area is a challenge, Lockheed and local officials concede. So the company, working with local schools, is hoping to develop its own talent.

Since the 2005-06 school year, Lockheed has provided \$45,000 to fund Project Lead the Way's engineering courses at three high schools in the local Antelope Valley Union High School District. The company's contribution pays for materials and supplies for at least three yearlong courses at each school.

David Vierra, superintendent of the Antelope Valley Union district near Palmdale, welcomes the corporate presence to an area that relies on engineers to feed its economy. Young workers with family ties there may be more likely to put down roots. "We're trying to develop a home-grown engineer," he

says.

Lancaster High School senior Amber Frauhofer said that had her school not introduced the engineering electives, she might have considered taking business, computers or third-year Spanish. Instead, she picked Introduction to Engineering last year, earning an A, and is now immersed in a Principles of Engineering class. She recently built an "optical encoder," a photoresistor she programmed to count flashes of light.



Amber Frauhofer

A strong math and science student, she says she hadn't previously considered pursuing an engineering career. Now, she says, "I'm intending to major in mechanical engineering."

Chatting With Engineers

Beyond coursework, Lockheed touts the benefits of introducing students to its local work force. Company engineers volunteer their time at the schools, serving as subject-matter experts to teachers, chatting about their own work or mentoring students on after-school robotics-club projects. This past fall the company started sending employees to high schools near Lockheed facilities in four other districts around the country that already employ Project Lead the Way's engineering curriculum.

Project Lead the Way's courses can be expensive to implement. Though corporations help underwrite the organization's free lesson plans, the group typically charges schools for supplies and for its 3-D design program, which is similar to software used by professional engineers. It can cost a high school up to \$100,000 to implement a minimum of four separate courses over four years, including computers, teacher-training conferences and supplies such as wire and measuring tools.

Intel Pulls Out

In about 20% of the cases, corporations provide money directly to schools to underwrite these costs, says Mr. Tebbano, the group's vice president of operations. Others may get funding from state budgets, foundations or even federal sources, he says. Last year, he says, the nonprofit generated \$4 million from software leasing and sales of educational materials, which went to sustaining the project's work.

Some schools are discovering that corporate support doesn't last forever. Since 2000, Intel has provided more than \$1 million toward the engineering curriculum in three school districts near its office campus in Colorado Springs, Colo. But a year ago, Intel announced plans to sell the plant and leave town. Spokeswoman Judith Cara says that Intel prefers to focus its local philanthropy on communities near its facilities, so funding for the school district will likely cease after 2008.

For its part, the district says it is committed to keeping its engineering programs and will seek other funding. But it says budgets for some things, such as development training trips for teachers, may have to be trimmed. Tom Junk, coordinator of education options for Falcon School District 49 in Colorado Springs, says: "When you lose the opportunity to get \$50,000, it's going to hurt in some places."

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