Companies Move to Rescue School Science

Corporate partnerships with high schools as well, as donations of equipment and training, have been spreading rapidly

Fairfax County in Virginia, a suburb of Washington, D.C, is one of the country's many aspirants to Silicon Valley-hood. It will soon be bolstering its claim with a fancy new high school for science and technology, a public school designed primarily to attract new high-tech companies to the area.

The school is being created with extensive aid and participation from local corporations. A foundation set up to solicit corporate donations has so far received over $856,000 in money and scientific equipment.

The school's 1200 students, selected through competitive examinations, will be subjected to a rigorous college-directed curriculum and enjoy the use of 13 labs, some of which would be the envy of any college. In addition to three basic science labs there will be applications labs—costing $200,000 each—in such fields as communications (with a dish antenna), energy, and health. Two computer rooms, containing 50 computers, will be available for homework and recreation.

New state or local "magnet" schools, most of them for science, are springing up around the country—many with substantial corporate backing. Most take the form of centers within existing schools. Some others are being developed along the lines of the pathbreaking North Carolina School for Science and Mathematics in Durham, a 2-year public boarding school that opened in 1980. Louisiana last year opened the School of Science, Math, and the Performing Arts on the campus of Northwest Louisiana State University in Natchitoches. In Batavia, Illinois, Fermilab director Leon Lederman has initiated a proposal for a 3-year Illinois Science Academy which would cover the sophomore year in high school through freshman year in college. "It gets rid of senior slump," says Lederman.

Contributions for these new high schools is actually only a small part of what is becoming a "tidal wave of interest by industry in the schools of America," according to Michael Roberts of IBM in Armonk, New York.

Corporate involvement in science education has in the past been largely confined to higher education and projects for minorities. But the picture has altered dramatically in the 2 years since the "Apple bill," designed to give tax breaks for donations of computers to public schools, died in Congress.

California, in the lead as usual, has passed its own Apple bill. Companies everywhere have been involved in donations of money and equipment to schools, training, competitions, and summer jobs. Coalitions, commissions, and networks are springing up to foster cooperation between business, science, and education.

An extensive phenomenon has been the proliferation of company-school partnerships, sometimes called "adopt-a-school." In Houston, for example, there was one such arrangement in 1979. Now there are 200. The nationwide total, including partnerships with banks, news papers, and other nontechnically based enterprises, is about 35,000.

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"The time is right," says one executive. Companies finally "woke up" to the problem, says Emory Rogers of Hewlett-Packard in Palo Alto. "We recognized we couldn't sit back and wait for universities to produce people."

The suddenness of the surge of involvement relates to a confluence of circumstances—alarm over the slippage of the U.S. position in world technology, the shortage of high-quality technical manpower, and the sorry state of science education. Demographic trends are coming home to roost: enrollments are down as the tail end of the baby boom enters the work force, and the background of students is increasingly uneven as a result of rising proportions of minorities. Furthermore, a new Rand report predicts a teaching "crisis" by the end of the decade as the continuing decline in the quantity and quality of teachers coincides with the surge of students from the current "baby boomlet."

Companies have become aware that the low level of verbal and mathematical competence among high school students directly affects the quality of the final product from universities. What has particularly galvanized them has been the issuance of no fewer than six alarming reports on education in an 18-month period. These included *A Nation at Risk** from the Department of Education and last year's report of the National Science Board, *Educating Americans for the 21st Century*,† which proposed sweeping changes to reverse a 20-year downward trend.

At the same time, the creep of technology into the schools is offering science-based companies unprecedented opportunities to share both their products and their expertise. Says Roberts of IBM: "For the first time, IBM is manufacturing a piece of equipment [the Personal Computer] that is really meaningful for precollege."

In a larger context, many corporate officials feel that new technology is helping precipitate radical change in education. It is "now on the cusp of a revolution," says L. Scott Miller of the Exxon Educational Foundation—one leading to a far more flexible system that is more finely geared to the needs of both individuals and of society.

The movement is being led by large national companies such as Hewlett-Packard. The company has a strong tradition of philanthropy but only got into high schools 2 years ago. It has been conducting a pilot program in 64 California high schools, where it has placed $3.2 million worth of computers and software, accompanied by computer training. Employees also get release time to do tutoring in schools. Typical of the various unorthodox arrangements throughout industry is one whereby an employee can make a grant of company equipment to a school if he can come up with one-fourth of the sales price.

Most corporate-sponsored programs are focused in their geographical areas. In Houston, for example, more than 100 companies are contributing about 1000 employees to teach in city high schools. Science education in Texas as a whole is benefiting from the efforts of computer

**A Nation at Risk: The Imperative for Educational Reform*, by the National Commission on Excellence in Education (Government Printing Office, Washington, D.C., 1983).

†By the National Science Board's Commission on Precollege Education in Math, Science, and Technology (National Science Board, National Science Foundation, Washington, D.C., 1983).

magnate Ross Perot, who sank $1 million into a study of public education sponsored by the governor. The legislation has adopted its recommendations, which will among other things curb the influence of conservative ideology in the selection of science textbooks. Perot is also trying to get educators to shift some attention from sports to basics and to introduce more academic substance into requirements for teacher certification.

One plan, national in scope, is being developed by Lockheed Corporation in Sunnyvale, California. Efforts are being made to form a consortium of national companies that will offer high school students and teachers salaried technical jobs during the summer. A pilot program in the San Francisco Bay area is to begin next summer. The experience, says Robert Haight of Lockheed, will give students "a firsthand feel for career paths. Kids know what doctors and lawyers do. But they don't know what a mathematician does every day." Ultimately, says Haight, they hope to locate 100,000 positions across the country.

To add glamor to the program, the consortium plans to stage a national science competition with winners from local fairs and fly the winner on the space shuttle in 1987. (NASA has been approached and seems receptive.) A teacher who has won a competition for innovative science teaching ideas will also get a place on the flight.

Lockheed has a particular interest in cultivating future talent: because of its defense contracting work, many jobs are open only to American citizens. But many university engineering departments are dominated by foreigners, particularly Asians. MIT graduate Herb Yuan of Shell Development Company in Houston has said that Shell has to hire 50 percent of its research personnel from abroad.

The problem is reflected throughout the system: in Georgia, high school officials have been going to West Germany to recruit science teachers.

The root of the problem, as corporations are coming to see it, is teacher training. Some companies think the world would be better off without teacher training colleges. One company is even designing a new model (which it is not ready to publicize).

Although reform of colleges of education is not now a major corporate goal, some companies, like IBM, have decided to focus their precollege efforts on teacher training. Roberts says that while the company donates equipment and training to schools (including $225,000 to the North Carolina school), its biggest precollege commitment—$12 million next year—is to a summer teacher training program. The course includes programming, the history and ethics of computing, the use of computers in teaching, and the instructional potentials of word processing.

Digital Equipment Corporation of Maynard, Massachusetts, one of the first companies to get involved in precollege education, is subsidizing a graduate program at the University of Massachusetts for math and science teachers. On completion of the 14-month program, teachers have to agree to stay in the school system for at least 3 years. Digital has another program that is unusual in that it involves parents as well as teachers in designing changes in science curricula.

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Another approach is being tried by the Exxon Educational Foundation, which has programs in Houston and New York for giving "minigrants" to individual teachers so they can try out innovative classroom ideas.

Although school boards are generally thrilled at getting help from private enterprise, most teachers are initially resistant to computers, says Anthony Napolitan of Hewlett-Packard. They fear encroachment on their functions and are "intimated because the students know more about computers than they do." But they almost always become enamored of the new medium.

It may be some time before any drawbacks to these various initiatives become apparent. New relationships with industry, as well as the higher salaries there, could help speed the drain of teachers into the private sector. And John Fowler of the National Science Teachers Association suggests that "adopt-a-school" partnerships could lead to "company schools." But for the most part, optimism prevails. "I am so enthusiastic about what we are doing that it's hard for me to see any downside," says Rogers of Hewlett-Packard.

The movement is basically pushing forward on two fronts: raising the overall level of scientific literacy and creating a scientific elite.

The elitist thrust, in the form of the new magnet schools, is generating some concern that they will be skimming the cream from the rest of the student population, as well as creating an additional drain on public resources.

But school officials indicate that schools are attracting new funds, both public and private. They say that they will be getting such a tiny percentage of students (Lederman says they are aiming for the top 0.1 percent in Illinois) that it will not affect the quality of the rest of the school population. And that 0.1 percent represents an enormous waste in terms of talented adolescents who feel bored and isolated in ordinary high schools.

On measures other than ability, schools are being careful to get a representative population. The North Carolina School has a system to make allowances for girls (at least two-thirds of the applicants are boys, judging by Virginia polls), graduates from backwoods high schools, and minorities (except for Asians who are always disproportionately qualified).

But there is no question in anyone's mind that it is out in the trenches where America's public education problems must be solved. Already some programs are being extended to encompass grade schools as well.

A new magazine, *ProEducation*, has recently been launched to track the "renaissance" of public-private cooperation in education. The phenomenon "is snowballing," says editor John Bayliss. "It just goes on and on and on." As Bayliss points out, the style of corporate giving has radically changed, from check-writing altruism to participatory self-interest.

Professional associations are now taking action to join in. The American Association of Engineering Societies is starting a coalition to pressure local school systems and legislatures to do something about raising teacher competence. The National Science Teachers Association has formed a "triangle coalition" of business, science, and education to start a data base, connect existing networks, and give grants to science teachers.

Mark Leuchtenberger of the North Carolina school says "people in high school education are working fast because they're afraid the tide of fashion is going to shift somewhere else." But the feeling of most corporate people is, as Miller of Exxon says, "this is not a fad. . . . The 19th-century factory called school shows signs of being radically transformed in our lifetime."

—CONSTANCE HOLDEN