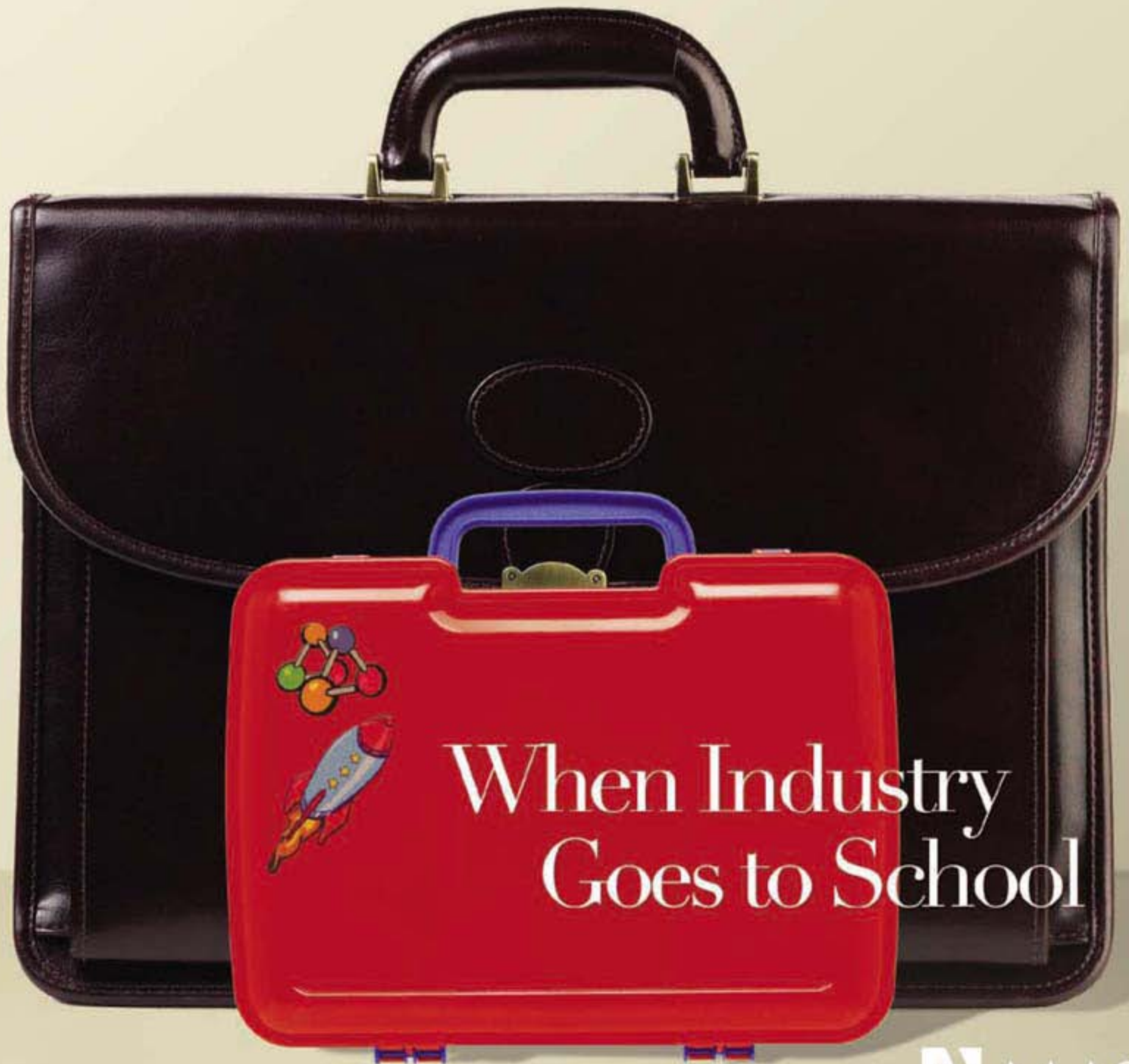


22 February 2008 | \$10

# Science



When Industry  
Goes to School

 AAAS



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## A New Bottom Line For School Science

Companies are pursuing an array of projects that they hope will improve math and science education in U.S. schools. Can such corporate philanthropy succeed?

CHICAGO, ILLINOIS—A new math and science charter high school opened this fall on this city's west side. It's named for Exelon CEO John Rowe, who gave \$2 million, and Frank Clark, chair and CEO of ComEd, a major Exelon subsidiary that lights the city, who chipped in \$200,000. Their gifts, plus \$2 million from the Chicago-based utility itself, created the Rowe-Clark Math and Science Academy, which currently shares space with a community health clinic in a squat, two-story building on a tired street in a mostly African-American community. "Math and science is what we do, and we hope to interest kids in careers that will eventually lead them to Exelon," explains Peggy Davis, a lawyer who oversees Exelon's philanthropic efforts as its vice president for diversity.

Big companies have long been involved in helping local schools. But Rowe went a step further by not only specifying the focus of the new school but also selecting the organization, the Noble Network of Charter Schools, to run it. It's a fresh challenge, admits Michael Milkie, a former Chicago math teacher who started the first school in 1999. Noble runs several college-preparatory schools, but none is focused on the sciences.

Much of the burden of devising and implementing a new curriculum has fallen on

Vanessa Galarza, the school's math and science department chair and sole science teacher for the 145 ninth graders who constitute the school's inaugural class. "Most of the students have never done a lab report or taken data from an experiment," says Galarza, a former doctoral student in astronomy at New Mexico State University in Las Cruces. And although she is grateful for the well-equipped labs that the Exelon gift made possible, Galarza knows they won't make up for the impoverished academic backgrounds of most of her students. "They've never kept a lab notebook. And I had to teach the X and Y axes," she says. "Also, I don't use a textbook or assign written homework because so many of them wouldn't be able to read it."

Davis, a member of the Chicago Board of Education and a former chief of staff to the current superintendent, understands how far the students at Rowe-Clark need to travel academically before they will be capable of landing a technical job at the utility company. "Ideally," she says, "we'd have loved to do a boarding school starting in first grade. That would have leveled the playing field by letting us deal with all the issues that students bring from home. But we have to be realistic about what we can afford."

Exelon's paternalistic attitude toward the

new school is characteristic of the latest wave of corporate philanthropy aimed at improving precollege STEM (science, technology, engineering, and mathematics) education in the United States. Corporate philanthropy is a \$14 billion enterprise, and education is the biggest recipient of that largess. Although no accurate figures are available, a sizable slice of that pie is devoted to pre-K-12 (prekindergarten through high school) activities in STEM education.

For decades, most companies supporting STEM education were content to stay in the background. The Intel (formerly Westinghouse) Science Talent Search that awards college scholarships to high school students may be the most prestigious example of such corporate altruism. Other companies have given grants to nonprofit organizations devoted to improving the skills of teachers or strengthening the math and science curriculum.

That's still happening. But Exelon and a growing list of companies without any such track record have put themselves and their employees on the front lines in response to the disappointing performance of U.S. students on more than a decade of international math and science tests. "We believe that American businesses must be active, engaged leaders in this work," proclaims a report issued last summer



◀ **A multiplier effect.** Exelon's support helped launch the new Rowe-Clark Math and Science Academy, a public charter school on Chicago's west side.

by the Business-Higher Education Forum.

Ernst and Young's Tony Anderson couldn't agree more. "We bring discipline to the issue and accountability. That's what seems to be needed," says Anderson, head of the Chicago office and vice chair of the New York City-based professional services firm, which operates an active mentoring program at several Chicago charter schools.

Clark, an African-American who grew up in a poor, single-family home on the city's South Side and who began at ComEd as a mail clerk, feels a personal obligation to lend a hand. "These kids are at risk, and without help they will struggle," he says, noting that he recognizes himself in some of the students he has met. "I won't be content if I don't do everything possible to give them a shot at getting to the top, like I did."

But is caring and cash enough to make a difference? Experts in corporate philanthropy and educational assessment say that although every little bit helps, many companies may have unrealistic hopes for what their dollars can accomplish. "If you lack firm goals, then measuring whether you've succeeded is very difficult. That's probably the most systemic problem we see across corporate philanthropy," says Gregory Hills of FSG Social Impact Advisors in Boston, which was hired by Ernst & Young to produce a report last year titled *Best in Class: How Top Corporations Can Help Transform Public Education*. Without clear-cut targets and a rigorous way to keep score, Hills warns, "the most that a company is going to achieve is some nice headlines, better ties with local leaders, and some new customers."

### Strategic philanthropy

There are three reasons companies invest in STEM education, says Hills. The first, and most common, is what he calls "communal obligation." By spending money in locations where they have plants and offices, companies hope to demonstrate that they are good corporate citizens. But because such philanthropy lacks any specific goals, he says, it's nearly impossible to assess the impact of those dollars on students.

PNC Financial Services found itself in that position a few years into a 10-year, \$100 million initiative begun in 2004 called Grow Up Great. After two rounds of grants to Head Start programs in nine states that the bank serves, says Eva Blum, president of the PNC Foundation, company officials realized that the portfolio was so diverse that it would be hard to scale

## From an Idea to a School

Not far from the neighborhood where Exelon has helped launch a school focusing on science and math (see main text), another giant Chicago-based corporation is funding a charter school with similar aims but using a different approach. Instead of the donor, Motorola, calling the shots, the new school for grades 6 through 12 is expected to be a test bed for university-based work on delivering STEM education in an urban setting.

Before the charter organization, Perspectives Charter Schools (PCS), even approached Motorola, it first teamed up with science educators Norman and Judith Lederman of the nearby Illinois Institute of Technology (IIT). The Ledermans, who are already working with several Chicago public schools, have spent years developing a curriculum that uses scientific inquiry as the driving principle for teaching every subject. The Ledermans found PCS, which runs four charter schools, through one of its science teachers-turned-administrators, Mary Cummane, who is working on her doctoral degree at IIT. Together, they drew up a proposal for a school that would incorporate their ideas on curriculum and professional development for STEM teachers. And Motorola, which had already promised to support a fund that aims to create 100 public charter schools in Chicago, loved it.

It didn't hurt that the director of the Motorola Foundation, Eileen Sweeney, had, a decade ago, helped start another inner-city charter high school, North Lawndale College Preparatory, while running the foundation for Chicago-based United Airlines. That experience taught her the value of assembling and retaining a top-notch teaching staff. She says PCS's ability to do that in the four other schools it runs, combined with the resources that IIT will contribute, makes the new academy "a dream come true" for Motorola, which in November made public its \$500,000 donation.

Motorola also hopes the school will augment ongoing efforts to increase student participation, especially by girls and minorities, in technology-related fields. Last fall, Motorola announced it would hand out \$3.5 million to 106 projects with that goal as part of its new Innovation Generation Grants program. A call for a second round of proposals, with \$4 million to be awarded, went out in December.

Asked what Motorola hopes to accomplish after 5 years by funding the new academy, Sweeney answers, "I'm glad that you said 5 years, because any change takes a while to show up." And whatever improvements occur, she adds, won't be something for which Motorola can claim credit. "We won't be breathing down their necks," she promises. "Sometimes the most important thing a company can do is to put its hand up and say, 'Yes, we believe all kids deserve a quality education.'" —J.D.M.

*"Sometimes the most important thing a company can do [is] say, 'Yes, we believe all kids deserve a quality education.'"*

—EILEEN SWEENEY,  
MOTOROLA FOUNDATION



**Brain trust.** From left, IIT's Judith and Norman Lederman plan a new Chicago charter school to be led by Mary Cummane.



up any projects found to be effective. So last year, the initiative, which has several components aimed at getting children ready for school, was refocused on giving Head Start teachers the math and science skills they lack to prepare children for a lifetime of learning.

Thanks to a 3-year, \$135,000 PNC grant, the 54 teachers at the Council of Three Rivers American Indian Center's Head Start program in Pittsburgh, Pennsylvania, "have become a lot more comfortable with science," says center director Maggie Gombas. In addition to receiving a flood of science materials, she says, the teachers learned at workshops led by the city's Carnegie Science Center "how to look beyond the obvious" by, for example, turning the tale of the Three Little Pigs into a lesson on wind as a force of nature.

The second type of philanthropy, which Hills calls "brand imaging," is meant "to influence its customers and the external world: government regulators, local officials, and so on." That approach may help companies improve their bottom lines and deflect unfavorable publicity, Hills says, but it makes them less likely to join forces with others and, thus, limits the impact of their philanthropy. "If PR and one-upmanship is the ethos" in the company, says Hills, it leads to "these silo programs."

S. Anders Hedberg, head of corporate philanthropy at Bristol-Myers Squibb (BMS), has tackled the branding problem head-on with a new program for high school students. Since the early 1990s, the New Jersey-based



**Building momentum.** Science teacher Vanessa Galarza helps Rowe-Clark students set up a lab in their introductory physics class.

pharmaceutical giant has given out tens of millions of dollars to improve the curriculum and quality of teaching at middle schools. Those programs, directed by the nonprofit National Science Resources Center (NSRC), a joint effort of the Smithsonian Institution and the U.S. National Academies, have been lauded for their progress in addressing two factors—uninspired instruction and poorly trained teachers—that give many preteens another reason to lose interest in math and science. But a few years ago, Hedberg, a cardiovascular pharmacologist who joined the company in 1980, decided that BMS needed "to move the needle forward." His team spent a few million dollars putting together a 12-lesson unit, called R<sub>x</sub>eSEARCH, that tells a fictitious story of an outbreak of an unknown, highly contagious disease. The unit, now being

piloted in the mid-Atlantic region, combines what the company knows best—drug discovery—with what it has learned about reforming STEM education.

One novel twist in the R<sub>x</sub>eSEARCH project is that it's run by a consortium of pharmaceutical and biotech companies, each of which has anted up for the material and for a summer institute to train teachers. The idea is for each partner company to work with school districts in the communities it serves, modifying the curriculum as needed with examples from its own labs. "It's always hard for a company to say to a competitor, 'I have a good idea. Do you want to join me?'" So we decided to give it away before it became branded

with the BMS name," Hedberg explains. The group has asked NSRC to help implement the project in an arrangement that is still being hashed out.

North Carolina-based Wachovia bank, third largest in the country, is also eschewing the "brand imaging" approach in an effort to encourage partnerships. In 2004, the bank began making competitive 3-year grants of as much as \$750,000 to universities and community organizations for new teacher training and professional development, with a focus on science and math. But it attached two strings. "We told them you can't use Wachovia's name [on any promotional material] because it turns off other potential donors," says Dee Lee, who runs the teaching initiative. "It was a huge change in our corporate philosophy." In addition, she says, the size of the grants tapers off



## Money Doesn't Always Talk

Companies are eager to describe their philanthropic efforts to improve math and science education. But they can be less forthcoming about the details. That's what *Science* found when it tried to follow the money trail of some large corporate STEM (science, technology, engineering, and mathematics) initiatives.

Boeing Co. spends \$21 million a year on education at all levels, says Joyce Walters, director of global community investing at the company and "subject matter expert" for the foundation's education activities. It supports dozens of programs that have attracted national attention, including

the Leadership and Assistance for Science Education Reform project in Washington state, and has recently ramped up a preschool learning initiative. But Susan Birkholtz, a company spokesperson, says, "We do not

provide lists of grantees, nor the amount of individual grants."

Houston, Texas-based Shell Oil Co., a subsidiary of the global energy giant, has a half-century track record of supporting precollege, university-based, and informal science education programs aimed at increasing the pool of students pursuing technical careers. In 2004, it shifted its mechanism for giving from the Shell Foundation to corporate offices "so that we could get more personally involved and be more of a partner," says Frazier Wilson, the company's social investment manager. In 2006, it joined with *Weekly Reader* to create a Web site for students and teachers called Energize Your Future with Shell that Wilson says tries "to make math and science fun" while building basic skills.

But again, don't bother to ask for too many details. "It is Shell policy not to disclose project budgets," explains company spokesperson Darci Sinclair. Also under wraps is a recent outside evaluation of its philanthropic efforts; Wilson would only say that it had led Shell to become "more engaged and increase its volunteerism." **—J.D.M.**



over the life of the project. "It puts the onus on them to find other partners and not use us as a crutch," she explains.

Hills's third type of corporate charity is the one he says works best. He calls it "strategic philanthropy," and it's distinguished by companies that ask: "What are our strategic business interests, and how does education and the work force fit into that strategy?" As a result, Hills says, "they pick things that they really care about and that they are good at."

That's what The Boeing Company has tried to do, says Joyce Walters, director of global community investing at the aerospace giant, which recently moved its corporate headquarters from Seattle, Washington, to Chicago. "We take a business approach to education investments" that include a Washington state science initiative, districtwide math reform in both cities, and a national program to train principals in urban school systems, she says. And rather than waiting to see whether a particular project succeeds or fails, Walters says Boeing stays involved after the money is handed out. "If one of our suppliers had a problem, we wouldn't just walk away. We'd try to figure out how to solve it. And that might include more resources."

Strategic philanthropy isn't the answer for every company, says Hills. "Some corporations don't believe that their business and social interests can overlap," he explains. "They see it as too self-serving." The Merck Institute for Science Education (MISE), created in 1993 to improve science and math in U.S. elementary and secondary schools, may be a case in point.

Then-CEO P. Roy Vagelos decided that a company so dependent on scientific talent "should be looking much earlier in the pipeline" than the small undergraduate program to attract minorities into the pharmaceutical industry that the New Jersey-based pharmaceutical company had been funding for years. Instead of making MISE an arm of the company's corporate philanthropy, however, Vagelos decided that the new, freestanding institute "should be clearly independent from the business part of Merck." He also recruited a director, Carlo Parravano, a chemistry professor at the State University of New York, Purchase, who had considerable experience in pre-college science education.

That hands-off approach seems to have worked well. During the past 15 years, MISE has funded \$50 million worth of projects, most aimed at improving the quality of middle

school science and math teachers. The institute has leveraged the support of its corporate benefactor to win two multimillion-dollar teacher-training grants from the U.S. National Science Foundation, the gold standard for work in the field of STEM education. And this year, Merck asked MISE to manage all of its science education activities.

#### Return on investment

Whatever a corporation decides to do, it will want to know at some point what its dollars have accomplished. But evaluation can be a casualty when corporate largess and the U.S. education system collide. "Measurement is a huge problem," says Mary Wright Benner, who runs the education arm of the Conference Board, a coalition of 2000 companies and



**Showtime.** Employees from Ernst & Young's Chicago office use the PBS show *Cyberchase* to help Perspectives-Calumet Middle School students with math.

organizations that has been a major voice in promoting STEM education. "Most schools are focused on what the state or federal government wants them to measure. Funders want to see results, and they may consider evaluation to be part of overhead."

One problem with evaluation is its price tag, says W. Steven Barnett, director of the National Institute for Early Education Research at Rutgers University in New Brunswick, New Jersey, and an adviser to the Grow Up Great program. "To do a real scientific evaluation, you can spend more than what the initiative itself costs," he says. "I think it's better for a company to advise policymakers to spend more on STEM rather than actually try to do it themselves."

Blum, of the PNC Foundation, admits that assessing what Grow Up Great has accomplished hasn't gone as smoothly as she had hoped. "Evaluating children at this age is difficult. And it's hard to isolate the impact of separate interventions," she says. The foundation

has received a federal grant to hire an outside evaluator for its math programs, and it is paying for a separate evaluation of its science efforts. The results of these evaluations, she says, will determine the future of the initiative.

Three Rivers's Gombas isn't sure that her center will even be able to teach other Head Start programs what it has learned. "I don't think it will work out that way," she says. In addition to the staffing problems created by sending teachers out periodically to work with programs at other locations, she says that the training "will lose a lot" of its value if the Carnegie center is no longer involved. Gombas also notes that her teachers feel "saturated with science" and eager to shore up their skills in other content areas.

Wachovia has also hired outside evaluators, Lee says, and initial results suggest that teachers who participated in the program feel more confident about their skills in many areas. But Lee says the initiative is really aiming at systemic change of STEM education. "We want to scale up what they've learned about leadership, decision-making, and working in teams," she says. "And the more outside groups that get involved, the better it will be for the kids."

After spending nearly 2 decades with one foot in industry and the other in education, BMS's Hedberg knows that systemic change is incredibly hard to achieve. And he offers a few lessons from his dual life to any company thinking of engaging in STEM philanthropy.

One is to start with what you know. "This curriculum is based on our industry's genetic code: how we develop a new drug," he says. "We're not telling teachers what to do. And it's not a marketing program. We're just giving them a version of the science, which is not suitable for the classroom in its raw form, in a format that they can use." Another is that one-shot approaches don't work. "We're hoping to follow the NSRC model, which incorporates professional development, curriculum, materials, community involvement, and assessment," he explains. "None is enough by itself."

A third lesson is that reformers need patience to overcome the tremendous inertia within both the education and the pharmaceutical sectors. "This is going to take years," Hedberg admits. "But I think the idea of multiple companies with equal voices is pretty darn new for the industry." **—JEFFREY MERVIS**