Cupertino, California

A Small School District Builds a Strong Corporate Partnership

The Cupertino Union School District serves students residing in a 26-square-mile area of northern California that includes the City of Cupertino and parts of Los Altos, San Jose, Santa Clara, Saratoga, and Sunnyvale. The district's 19 elementary schools have an enrollment of 14,500 and a teaching staff of 523.

The major focus of the Cupertino Union School District has been on curriculum selection, professional development, and building community support. The district selected an inquiry-centered science curriculum and instituted a comprehensive professional development program. Through a strong partnership with Hewlett-Packard, both teachers and students have benefited from the expertise of scientists.

In the summer of 1992, Marybarbara Zorio and her teammates came to the National Science Resources Center's (NSRC) Elementary Science Leadership Institute prepared to meet new challenges. "We had the new *California Science Framework* under one arm and blank newsprint paper under the other," she recalls. Zorio herself had been named district science resource teacher only two days earlier.

The Cupertino team was not starting from scratch. The district had already initiated hands-on science in some of its elementary schools. It had a longstanding commitment to staff development. Equally important, the science program had strong backing from a corporate partner, the Hewlett-Packard Company. Under the Hewlett-Packard—Cupertino partnership, which began in 1987, 70 Hewlett-Packard mathematicians and scientists visited students and teachers in two different schools every week. Hewlett-Packard also offered science classes to Cupertino teachers and administrators. And in 1992, Hewlett-Packard awarded the district a three-year grant that would provide $30,000 per year for the elementary science program. The district decided to earmark these funds for staff development.

Mark Butler, a Hewlett-Packard scientist and member of the Leadership Institute team, recalls the enthusiasm shared by his teammates early on. "It was a great kickoff for the whole program," he recalls. Even though Hewlett-Packard had been involved in science education reform in Cupertino for many years, it was in the team-building environment of the Institute that the members were able to "bond" and the program gained momentum.

Taking Steps Toward Science Education Reform

At the Institute, Zorio, Butler, and their teammates drafted a three-year plan for science education reform. "It wasn't written in cement. Sometimes we had to change course," Zorio admits, "but we had a road along which we were moving." The plan had a dual function: to meet local needs as well as the criteria set forth in the newly issued *California Framework*.

A first step in the plan was to develop a system for introducing the key science content areas. Cupertino decided to focus first on the physical sciences; life science and earth science would be introduced in years 2 and 3, respectively. A second step was to select the curricula. The *California Framework* recommended five elementary science programs, including the NSRC's Science and Technology for Children (STC) program. The district invited representatives of these programs to make presentations concerning their products. Selected modules were pilot-tested in winter 1993. Working as partners, two teachers- a veteran science teacher and a less-experienced, "science-shy" teacher- taught each of the modules under consideration for adoption. The experiences of the two teachers combined, Zorio noted, gave the team the needed "rounded perspective."

Staff Development: "The Power Has to Come from Within"
Staff development might be described as the linchpin of science education reform in Cupertino. The district's staff development plan, initiated well in advance of classroom implementation of hands-on science, is centered on learning by example. Teachers have the opportunity to experience the kinds of instruction they are expected to provide to their students.

All of Cupertino's elementary school teachers had that experiential opportunity on September 26, 1994, when Cupertino held its first districtwide Science Learning Day. Teachers who had pilot-tested the kits chosen for inclusion in the curriculum conducted walk-throughs of the materials for their colleagues who would be presenting those modules in their classrooms in the fall. In all, 13 different kits in the physical sciences were presented. The event was highly successful, and a second Science Learning Day was scheduled for May 1995.

One reason for the success of this event is that the planners tapped expertise among the teachers. "The power of staff development has to come from within," Zorio comments. This approach has an added advantage: it is cost-effective. Teachers familiar with the kits can replicate the sessions for their colleagues throughout the year at convenient times, and they are close at hand for follow-up consultations.

John Erkman, director of instruction since 1993, maintains that the approach being used in training teachers in science fits well within the district's overall staff development model. "We have a commitment to make sure we give our teachers the best content knowledge balanced with the opportunities for coaching, peer support, reflection, and practice that have to be in place to make the content integral to the classroom experience," he says.

Elementary science education reform, the Cupertino planners know, is much more than using kits and getting students involved in hands-on activities. In Erkman's words, "It's bringing questioning and discovery into the classroom. Our teachers must shift from being the 'fountain of knowledge' into being people who guide students in finding information. If our teachers are going to make that shift, we've got to do more than simply say, 'Go ahead and do this.'"

Mentor teacher Patti Holcomb, previously counted among the "science-shy," attests to the impact of Cupertino's staff development program and the paradigm shift to which Erkman refers. "The focus of our training," she recalls, "was to make us more comfortable with our general knowledge of science. Part of this is realizing that we don't need to have all the answers. What we *do* need to know is where to go to find them."

The Hewlett-Packard Partnership: "More than Money Alone"

The financial support of the Hewlett-Packard Company was instrumental in getting the Cupertino program off to a strong start, and the district recently received a second Hewlett-Packard grant. Nonetheless, in Zorio's words, it's been "more than money alone" when it comes to the importance of Hewlett-Packard in helping the district realize its science education goals.

For example, Hewlett-Packard consultants helped the district design its materials center, where the science kits are stored. They also set up the classroom computers and are information resources for Holcomb and others. When a difficult question arises in a module in STC's *Magnets and Motors* unit, Holcomb's fifth-graders can communicate on-line with Hewlett-Packard staff. Because of this close collaboration with a technology-based company, says Holcomb, the students "don't feel like they're outside of science. They like the feeling of being in the middle, rather than being on the outside looking in."

When the corporate partnership began, Hewlett-Packard gave Mark Butler full-time responsibility for serving as a liaison between the school system and the company. His job is to match Hewlett-Packard resources with learning needs. One of the most productive matches has involved Chuck Morehouse, a Hewlett-Packard physical scientist. As part of Cupertino's "Afternoon with the Science Expert" program, Morehouse has met monthly with fifth-grade teachers who are teaching *Magnets and Motors*. A second physical scientist is slated to help out in a similar fashion with the STC first-grade module *Solids and Liquids*.

Morehouse is a central resource for all teachers. Under a new program, Science Partners, which began in the 1994-95 academic year, Hewlett-Packard scientists volunteer to work with individual teachers in their classrooms on a one-on-one basis. Eight Cupertino schools were involved in Science Partners during its first year. Following a successful pilot test, the project, Butler notes, will be "rolled out" so that there will be at least three or four scientists in each of the district's 19 elementary schools. Hewlett-Packard has also introduced the program in other school districts.

A Broadening Circle of Support

At the NSRC Leadership Institute, the Cupertino team gained an understanding of the importance of community involvement. Consequently, the district formed two community task forces. The groups tackled important questions such as, What does the community value in science education? and What can we do to provide that to students? Both groups have become solid advocates for science education reform- especially important resources in an era of budget cutbacks.

Community scientists have also been drawn into the action; for example, an environmental scientist from the City of Cupertino recently visited a classroom to help students with a composting activity. The partnership established with Hewlett-Packard has thus been complemented by a broadening community partnership in Cupertino. Erkman sums it up like this: "Our teachers have multiple layers of support- from mentors, lead teachers, and community scientists."

By building an effective corporate partnership and focusing on staff development, Cupertino has developed a broad base of support for its elementary science program. This has enabled the school district to create an elementary science program that meets exacting state standards, provides its students with challenging opportunities in science education, and boasts a cadre of enthusiastic, well-informed, and well-equipped teachers.

Lessons Learned

- Creative corporate partnerships with school districts can provide opportunities for engineers and scientists to become directly involved in school science programs.

- School districts can tap local expertise by giving their own experienced staff responsibility for professional development. This increases the probability that staff will be enthusiastic about the program, and it is also cost-effective.

- Community task forces can offer a rich source of input into planning efforts and broaden the base of support in the community.