

Designing, and Making, the New American High School

By Bob Pearlman

Newspapers across the country are filled with stories of high school failure. "More than Half of California 9th Graders Flunk Exit Exam," a recent headline in Education Week (June 20, 2001), typifies this trend. In the next 10 years we can be sure that there will be high school failure everywhere unless states artificially lower the standards, a real possibility, or schools change the high school experience to engage and motivate students to learn. This author presents the case for the latter event.

The push to reinvent the now 100-year-old institution of the American high school has just gotten a big boost. The Carnegie Corporation of New York and the Bill & Melinda Gates Foundation announced in October 2001 a \$60 million Schools for the New Society investment in seven urban districts to "reinvent the high school experience for more than 140,000 students in more than 100 schools."

What changes in the high school program and in its supporting facilities and technology will be needed to "reinvent the high school experience"? And even if you get the design right, what are the challenges in starting up schools like these and establishing a new culture of teaching and learning?

The Design Challenge

Would you want to be a student in high school today? Listen to Richard Russo, author of *Empire Falls*, one of this past summer's best reads. Russo, in his acknowledgments, thanks his daughter Kate "for reminding me by means of concrete detail just how horrible high school can be, and how lucky we all are to escape more or less intact."

Haven't we all had a nightmare where it's discovered that somehow we didn't get all our high school credits and had to go back to high school, like Kathleen Turner in her 1986 movie, *Peggy Sue Got Married*?

If you had it to do all over again, what would you change in the high school experience? The starting point in redesigning the high schools, and the high school experience, is specifying what you want to change. Ask any group of adults what high school was like, especially educators, and they will come up with a similar list. Here's what the 200 educators from the United States and Europe said at Alan November's 2001 summer institute, *Aligning Technology Resources: Empowering Teaching and Learning*:

- "I felt no influence and control over my learning."
- "I was one of the herd. There's no personal element."
- "I couldn't pursue my interests."
- "The teachers seemed miserable in their teaching."
- "They steered girls away from math, science, journalism, etc."
- "I was not a partner in my own learning."
- "What we knew wasn't valued and respected."
- "There was rigidity in thought and in the physical structure."
- "It was not a 'workspace.' It felt like a prison."

And what would the kids say? Shouldn't we ask them? That's what England's *Guardian* newspaper did in June 2001 when it reprised a public competition first conducted in 1967, in which kids across England

wrote essays about “The school that I’d like” (edited by Edward Blishen, Penguin Education Special, England, 1969). One 15-year-old girl summed up school at that time as “institutions of today run on the principles of yesterday.” Has anything changed?

In the summer of 2001, here’s what the kids wrote (see <http://education.guardian.co.uk/schools/story/0,5500,501374,00.html>).

The school we’d like is

- ▶ **a beautiful school** with glass dome roofs to let in the light, uncluttered classrooms, and brightly coloured walls.
- ▶ **a safe school** with swipe cards for the school gate, anti-bully alarms, first aid classes, and someone to talk to about our problems.
- ▶ **a listening school** with children on the governing body, class representatives, and the chance to vote for the teachers.
- ▶ **a flexible school** without rigid timetables or exams, without compulsory homework, without a one-size-fits-all curriculum, so we can follow our own interests and spend more time on what we enjoy.
- ▶ **a relevant school** where we learn through experience, experiments, and exploration, with trips to historic sites and teachers who have practical experience of what they teach.
- ▶ **a respectful school** where we are not treated as empty vessels to be filled with information, where teachers treat us as individuals, where children and adults can talk freely to each other, and our opinion matters.
- ▶ **a school without walls** so we can go outside to learn, with animals to look after and wild gardens to explore.
- ▶ **a school for everybody** with boys and girls from all backgrounds and abilities, with no grading, so we don’t compete against each other, but just do our best.

If you had it to do all over again, what would you change in the high school experience?

The English kids are not alone in their thinking. The International Society of Technology in Education (ISTE) also asked the kids at a special Student Technology Leadership Symposium, June 23–24, 2001, held in conjunction with NECC. As reported by student Pooja Agarwal in “If I Could Make a School” (*Learning and Leading with Technology*, November 2001), the U.S. student leaders want schools that

- are fun
- end lecturing from a textbook
- institute problem-based, discovery-based, and inquiry-based curricula
- implement “real life” situations and hands-on learning
- shape the curriculum with student internship experiences
- build relationships and “animated mutual learning” between adults and students
- provide an “inviting” physical environment
- provide the technology tools for students and teachers to do their work

The criteria articulated by the English and American kids and by the international educators at the 2001 Summer Institute constitute appropriate design criteria for the new high school: Safe, Respect, Personal, Interests, Experience, Real World, Work-space, Tools.

Note how the kids emphasize relevant, real-world, hands-on experience. Are they wrong in this supposed era of standardized tests that often demand standardized learning? Not according to Robert Reich, economist and former U.S. Secretary of Labor, now running for governor of Massachusetts. “Many jobs depend on creativity,” says Reich in “Standards for What” (*Education Week*, Commentary, June 30, 2001), “Standardized tests can’t measure these sorts of things.”

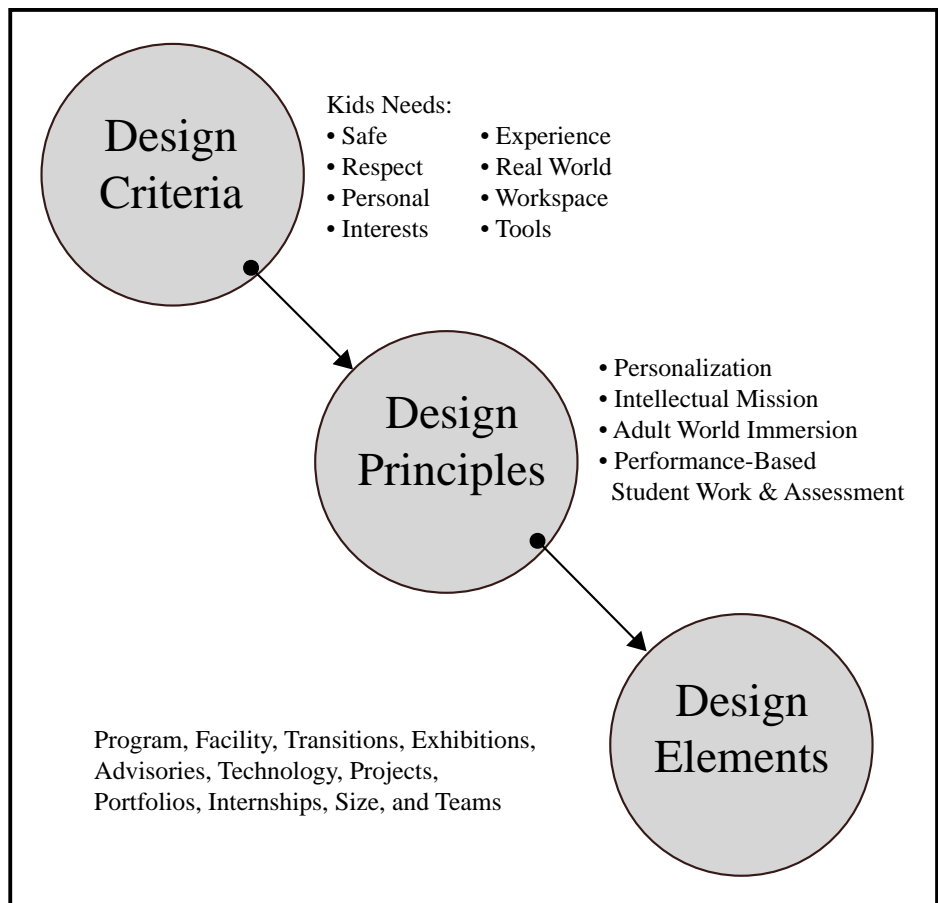
Over the past decade many educators have been at work to redesign the American high school. They have captured these design criteria in what are called Design Principles. In the *New Urban High School Practitioner's Guide* (1998), the New Urban High School project articulated these key principles as Personalization, Intellectual Mission, Adult World Immersion, and Performance-Based Student Work & Assessment (see <http://www.bigpicture.org/NUHSPractionersGuide.htm>).

Whether you start with design criteria or design principles, designing the new American high school means specifying the Design Elements—what you actually do to put the principles to work: Program, Facility, Transitions, Exhibitions, Advisories, Technology, Projects, Portfolios, Internships, Organization, Size, and Team.

New Small High Schools

Three new small high schools demonstrate these design principles and criteria in action, while exhibiting distinct design elements: the Met High School in Providence, Rhode Island (see page 15); Napa New Technology High School in Napa, California (see page 16); and High Tech High School in San Diego (see below and page 17). In turn, these design elements require innovative facilities and technology to support their programmatic designs. These are lab schools that one can learn a tremendous amount from. While each design is highly replicable, it takes real educational entrepreneurs and leaders to put them in place.

San Diego's High Tech High (HTH) is a microcosm that demonstrates how facilities and technology support the design principles and student learning. It opened in 2000 and is now in its second year. The



school was conceived by and launched by a coalition of more than 40 public and corporate partners led by Qualcomm that were part of a San Diego Chamber of Commerce task force. The task force met over two years and focused on developing a new high school education commensurate with San Diego's transformation from a military-dominated economy to an emerging high-tech regional economy, led by telecommunications and biotechnology.

The task force hired Larry Rosenstock as the founding CEO/principal. Rosenstock was formerly the director of the New Urban High School Project and principal at the Cambridge (Massachusetts) Rindge School of Technical Arts.

High Tech High is a public charter high school with a diverse student population that mirrors the San Diego Unified School District. The school opened in September 2000 with 200 students in 9th and 10th grades, now has 300 students, and will reach 400 students in grades 9–12 at full enrollment next year.

HTH brings to life its design principles of Personalization, Intellectual Mission, Adult World Immersion, and Performance-Based Student Work & Assessment through its size and school organization, its facilities, its program, and its technology.

When you walk into High Tech High you feel like you're in a workplace. The main section of the school, the Great Room, houses the student workstation suites where upper-school grades 11 and 12 students work on self-directed projects one-half of every day. Artwork and glass walls are everywhere. So is wiring, neatly routed in visible overhead cable trays and conduits. Classrooms, which HTH calls seminar rooms, feature flexible furniture and Smart Boards. Not a lot of teachers are presenting in this environment. Mostly it's the students who present their work and ideas.

Four structures provide a sense of place and identity to HTH students:

1. Workstation suites, where they have their own personal computer and workspace
2. Project Studios, where teams work to plan and construct models
3. Construction Labs (Video, BioTech, Animation, and Engineering)
4. Meeting/presentation spaces and conference rooms

The facility supports a unique school organization, which is designed to build personal relationships, particularly for students with their teacher/advisors, teachers, and workplace mentors. Both Upper (grades 11–12) and Lower (grades 9–10) Schools are broken down into teams of 70 to 100 students, each with five teachers or support people. Each teacher has 20 kids in an Advisory Group that they stay with the entire time they are at HTH. The advisors meet as a group, in the seminar rooms, almost every day. Teacher/Advisors meet with students, parents, and their workplace mentors to plan a student's program. Teachers have both their own office cubicles in a shared office suite and several small conference rooms to use for small meetings.

The Met High School, Providence, Rhode Island

The Metropolitan Regional Career and Technical Center (<http://www.met.state.k12.ri.us/>), founded by Dennis Littky and Elliot Washor, opened in 1996 in Providence, Rhode Island. The initial site for 100 students was housed in traditional classroom spaces at the downtown Sawyer Building. In 1999, the Met opened a second school of 100 kids on Peace Street. This remarkable facility includes classroom/workrooms, project rooms, advisory rooms, and a large common room. Four additional small schools, each using a similar facility design as Peace Street, will open in Fall 2002, on a common campus. Each 100-student-site "small school" at the Met has eight teachers in four learning groups and eight advisory groups. The small size is aimed at personalizing student learning.



A Met High School student team works together in one of the school's advisory rooms.

A key slogan at the Met is, "One Kid at a Time." The teacher/advisor works with 12 kids for four years and focuses on each kid as an individual. At the Met the curriculum is Learning Through Internships (LTIs) that are based on the students' interests. Students work with mentors in the "real world" and come to school to reflect on what they are learning on the job. Kids work with their parents, teacher/advisor, and workplace mentor to develop their own personal learning plan. No school has gone as far and as radical as the Met in developing this structure. Classroom/workrooms have state-of-the-art computers, peripherals, and presentation technologies for students to do their work and exhibit it. •

Curriculum is project-based, but HTH teachers still find that they need to do some direct instruction. In math, HTH utilizes a tutorial, self-paced approach. Starting with a more structured Lower School, kids work toward a more unstructured, self-motivated learning and work environment in grades 11–12.

HTH is a learning environment peopled by scores of adults. For instance, speakers and outside experts are constantly brought in as student resources, and brown-bag lunches with visiting speakers take place all the time. Students experience adult immersion in both their internships and in their school.

Key elements of the HTH program include:

- **Projects.** Student work is built around short- and long-term projects, to encourage in-depth work.
- **Portfolios.** Digital portfolios are built by every student during their entire four years and published on the school Web site. The portfolio contains both an English and a Spanish version, “Mi Mundo.”

Portfolios include a Personal Statement, a current and future resume, student projects and work samples, contact information, internship reflections, and assessments.

- **Exhibitions.** Every trimester all students exhibit their projects to their parents, their peers, and the community.
- **Internships.** Students in the upper grades do an internship two afternoons every week. Students do reflective writing on their internship experience and present projects to their team at work. Kids at HTH feel a real sense of respect and value in the workplace.
- **Transitions.** HTH uses trimester, grade, Lower to Upper School, and graduation transitions to motivate students and structure student work. At each transition students exhibit their projects, update their Digital Portfolios, and sometimes apply for the next stage (Lower to Upper School, and graduation).

New Technology High School, Napa, California

The Napa New Technology High School (NTHS) has graduated 361 students since it opened in 1996 (<http://www.newtechhigh.org>). The school serves 200 students in grades 11–12; 69 percent of the students come from the Napa Valley Unified School District, 5 percent from other cities in Napa County, and the remaining 26 percent from surrounding Solano, Contra Costa, and Sonoma Counties. For students, Napa New Tech is a beautiful physical environment. It looks like a workplace, not a school. Large classrooms house computer workstations on one side, and project tables throughout. NTHS CEO/Director Mark Morrison calls it “a high-tech, high-touch learning environment.”

All students take a New Media course that gives them the skills to use powerful authoring and presentation technologies in all their work. Technology is integrated into every class, but the school says that project-based learning, not technology, is the backbone of its “unique learning environment.” The school’s official history proclaims: “You won’t find any boring book reports at New Tech High—you’re more likely to see a detailed Web site with original graphics and links to related sites, or a beautifully designed Power Point presentation combining digital photography and original text.” NTHS has been a national pioneer on the use of student Digital Portfolios to give structure and continuity to student work and performance. It is one of the few schools in the country where you can see extensive samples of student work on its public Web site’s Digital Portfolio section (<http://www.newtechhigh.org>)



Napa New Tech High Networking teacher Carolyn Ferris works with a student on her project.

School/Students_parents/portfolios.asp). Seniors do internships in a local business and author Project Work Summaries about their experiences that become part of their professional digital portfolio. Students also are required to achieve eight learning outcomes: technological literacy, collaboration, critical thinking and problem solving, oral communication, written communication, citizenship and ethics, career preparation, and curricular literacy. •

Courtesy of New Technology High School

Technology at San Diego's High Tech High

Technology is a critical component to supporting every aspect of the program and design of San Diego's High Tech High (<http://www.hightechhigh.org>). Students do their work with technology, exhibit their work, and communicate with their teachers and outside experts about their work. CEO/Principal Larry Rosenstock says that "technology is not studied as a subject; rather technology tools, both 2-D and 3-D, are ubiquitous and used for producing—making, shaping, and forming." According to Rosenstock, a school slogan is: "You can play video games at HTH, but only if you make them here."

Students use personal computers in their own workstation suites half of every day. Each teacher has his or her own phone,

computer, and office cubicle. Students and teachers have open access to exhibition technology in every seminar room and in the Commons Room. A significant technology infrastructure supports all this technology, including a top-of-the-line wired network, a leased T-1 line for voice and data, and a wireless network that is also supporting the use of pocket PCs.

For its current 300 students, HTH has 224 computers, 140 client computers, almost all Intergraph (SGI) with CD-RWs, and 84 more client machines, high-end PCs and Macs. Animation lab computers have Video Graphics and 3-D acceleration cards. Each Seminar Room has a suite of presentation

technologies for student and teacher use, including a Smart Board, a video projector, a mixer and amplifier, a cordless microphone, a CD/tape player, a computer, and a VCR. Students utilize a wide array of technology applications to do their work:

- Word processing (Microsoft Word and Office) to write papers and journals
- Email communication to consult experts and partners and to send work to their project teammates and their teachers (Microsoft Outlook and Webmail)
- Internet for investigative research
- Multimedia tools to create online multimedia documents (Microsoft PowerPoint,) and Web sites (DreamWeaver and Flash by Macromedia, HTML, JavaScript)
- Video tools, including Digital Cameras, and a video-editing lab
- Photography using digital cameras •



High Tech High's Great Room and workstation suites provide plenty of space and technology for students to pursue self-directed learning projects.

David Stephen, courtesy of High Tech High Learning

Replacing the Factory Model with the Student Workplace

"In the new economy, all work is project work. And you are your projects!" says management guru Tom Peters.¹ To many educators teamwork, problem solving, project management, and communication skills are just verbiage from the now 10-year-old SCANS report, or from the latest variation of that report.² But the workplaces of the New Economy are real and exist everywhere, not just in the Silicon Valley and its many regional imitators. In these workplaces people do projects, individually and in teams. They write memos and business plans, and communicate their ideas to their co-workers, managers, and clients through PowerPoint presentations and Web sites.

High Tech High, the Met, and Napa New Tech High have replaced the factory-model school with the student workplace. Students are empowered through their relationships, their physical environment, and their technology tools, to learn, produce, and present. Kids at these schools are kids who know and do.³ They have the spaces to work in and learn: individual

1. "The Wow Project," by Tom Peters, in *Fast Company* magazine, May 1999, <http://www.fastcompany.com/online/24/wowproj.html>.
2. "What Work Requires of Schools," *The Secretary's Commission on Achieving Necessary Skills (SCANS)*, 1991, <http://wdr.doleta.gov/SCANS/whatwork>. Also see NCREL's "21st Century Skills" at <http://www.ncrel.org/engage/skills/skills.htm>.
3. "Kids Who Know and Do" is the name of the annual project-based learning conference held in San Francisco, founded by the Autodesk Foundation and now sponsored by Co-nect (see <http://www.kwkd.net>).

workstations/cubicles, project rooms, presentation rooms, advisory rooms, and real-world workplaces—and the technology tools to do their work, to learn through projects, to turn projects into products that they can exhibit and share with others.

Others will design their own version of the New American Small High School in the coming years. But unlike today's comprehensive high schools (those "institutions of today run on the principles of yesterday"), these new small high schools provide the learning environment, the work environment, and the tools kids need to do their work.

Making the New American High School— The Implementation Challenge

In real life, the design challenge is dwarfed by the implementation challenge. To bring schools like these to life, education leaders and entrepreneurs need to raise the funds, hire and develop the key staff, and work with the staff to acculturate students to the new environments and new approaches to learning.

High Tech High, the Met, and Napa New Tech High are cases in point, each arising in special circumstances. Each of these schools has a beautiful, innovative facility. High Tech High is a public charter school founded by a business coalition that raised more than \$6 million for start-up. The Met's Co-Directors, Dennis Littky and Elliot Washor, worked with their board leaders to petition the state of Rhode Island for a \$28 million bond to create a state-sponsored school. Napa New Tech's founders included key local business leaders who marshaled local district and outside resources and business support to launch the school.

It takes entrepreneurs to launch innovative schools, particularly when there are no visible national exemplars. Ultimately public school districts across the country will finance and build schools like these. But in this early period, leaders need to know a lot more than curriculum and program. They need the same 21st-century skill set that their future students will require, including the ability to write a business plan, communicate it, and demonstrate capacity to carry it out.

Schools like these can be launched as either public charter schools or as district-sponsored. For charter schools, considerable funds will have to be raised, because few state charter laws provide capital support for facilities. Complicating matters is the fact that raising funds for school construction from private sources became much more difficult as the 10-year expansion of the American economy came to a halt last year.

Are Students Successful at These New High Schools?

Has reinventing the high school experience made any difference in the success of the students? For Napa New Technology High School and the Met, their first students are now in college, while High Tech High's oldest students are now in the 11th grade. Each of these schools believes that the real measure of success is not standardized test scores, but instead the postsecondary success of its students, measured in college-going, college-retention, college-graduating rates, and labor market outcomes. Each school is now working with evaluators to capture that data, but the story will only unfold over several years. Preliminary data, however, appears hopeful.

Forty-six **Met** seniors graduated on June 9, 2000, in ceremonies held on the Brown University campus. Every member of that graduating class is attending college, of whom 74 percent are the first generation to be college-bound in their families. The Met does not give standardized tests, considering them a poor measure of student success. However, it does report holding data (absentee rate, suspension rate, and dropout rate) and progress on the school's five learning goals. The absentee rate, suspension rate, and dropout rate are, respectively, 7 percent, 1.4 percent, and 8 percent, compared with 20 percent, 8 percent, and 27 percent rates in Providence's other eight high schools. (The Met data is from Eliot Levine, *One Kid at a Time* [New York: Teachers College Press, 2002]).

At **Napa New Technology High School**, 98, 80, and 85 students graduated in 1998, 1999, and 2000, respectively, with college-going rates of 95 percent, 95 percent, and 98 percent for the respective classes. This compares with a district average college-going rate of 38 percent over the same period. New Tech High achieved a top rank of 10 on California's Academic Performance Index (API), the only high school in Napa County to receive a top rank. New Tech High had a 2.5 percent absentee rate, a 3 percent suspension rate, and a 0 percent dropout rate in 2000–01.

High Tech High students also achieved a top rank of 10 on California's API for 2001 and a similar schools top rank of 10, the highest high school scores in San Diego County. HTH's absentee rate for 2000–01 was 4.1 percent, and its suspension rate was 7 percent.

Each of these schools' student bodies fully reflects the ethnic diversity of their local school districts. •

For in-district schools, the challenge is different. There, where teacher unions often have contracts, the new school's leaders will have to get special agreements with both the district and the union to provide them with autonomy from district rules and union contract provisions, particularly for staff selection and de-selection. It's hard enough to get teachers who know how to work effectively in a project-based learning environment. Having to staff a new kind of school with teachers who don't share the vision, and the practice, is crippling. Such enabling processes in districts with unions can only come about through a serious collaborative bargaining process, and partnership, with the teachers and administrators unions. Nationally, only Boston has a negotiated process for new school start-up through its pilot ("in-district charter") schools.

Some help, fortunately, is on the way. High Tech High, the Met, and Napa New Tech High have each received funding from the Bill & Melinda Gates Foundation to support groups to replicate their designs in 10 or more sites across the country. This

enables the new replication organizations to provide support and services, and some cash, to replication sites, and to develop organizations that in the future can provide such services on a fee-for-service basis. This won't eliminate the implementation challenge, but it will help.

A final implementation challenge is much more serious. No one will have an easy time, in the beginning, acculturating their first groups of students to the new learning environments. Students have already spent eight years or more in factory-model schools. It will take them some practice, some experience, and some mentoring and coaching from older students and teachers, to thrive as self-directed students. But the evidence is in at the Met and Napa, both schools in their sixth year, and the two-year-old High Tech High, that the new culture takes hold progressively over the first two years. Visitors to these schools may find them a little more noisy than traditional high schools, but it's the sound of students at work that they are hearing. And it's worth the time and effort to achieve it. ◀

Links for More Information

The Met

InterMET: <http://www.met.state.k12.ri.us/>
 The MET Center Portfolio: <http://www.bigpicture.org/metport9798coverpage.htm>
 The Big Picture Company, designer of the MET: <http://www.bigpicture.org/>
 The MET and the Big Picture Company: <http://www.bigpicture.org/materials.htm>
 Building on Experience, *Education Week* (5/3/00): <http://www.bigpicture.org/EdWeekAPNov2000.htm>
 A New Model of Connected Learning, *Converge*: <http://www.convergemag.com/Publications/CNVGJan00/MetCenter/FeatureMetCenter.shtm>
 Digitopolis, USA, *Converge*, (1/01): <http://www.convergemag.com/Publications/CNVGJan01/digitopolis.shtm>

Napa New Tech

Napa New Tech High: <http://www.newtechhigh.com/>
 If We Can Do It, Anyone Can! *Converge* (10/98): <http://www.convergemag.com/Publications/CNVGOct98/newtechhigh/newtechhigh.shtm>
 Side-By-Side, *Converge* (4/00): <http://www.convergemag.com/Publications/CNVGApr00/SideBySide/sidebyside.shtm>
 Education is the focus at high-tech high: <http://www.cnn.com/TECH/9701/20/high.tech.high/>

Desktop PCs bring fast times to New Tech High: http://www.gcn.com/state/vol6_no5/com/706-1.htm
 From High Tech High School to Hot Jobs: <http://www.techtv.com/news/business/story/0,24195,2235925,00.html>
 New American High School recognition: <http://www.ed.gov/offices/OVAE/nahs/nahsschools/newtechca00.html>

High Tech High

Business Week article: http://www.businessweek.com/2000/00_35/b3696053.htm
 Governor's press release, HTH visit: <http://hightechhigh.org/news/newsarchiveddocuments/govdavispressrelease26oct00.html>
 San Diego Charter School a Model for Technology Leaders, *New York Times* (11/1/00): <http://hightechhigh.org/news/newsarchiveddocuments/nyt1nov00.html>
 Gates foos bill for tech high schools, *San Diego Union-Tribune*: <http://hightechhigh.org/news/newsarchiveddocuments/sdut15nov00.html>
 Gates Foundation press release: <http://www.gatesfoundation.org/education/schoolgrants/announcements/announce-314.htm>
 High Tech High: cutting edge, *San Diego Union-Tribune*: <http://hightechhigh.org/news/newsarchiveddocuments/sdut26sep00.htm>