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The Role of Technology and Facilities in Redesigning the American High School

~ By Bob Pearlman

This article is based on the Keynote presentation to Alan November's Summer Institute 2001, Aligning Technology Resources: Empowering Teaching and Learning.

The push to reinvent the 100-year old American High School has just gotten a big boost. The Carnegie Corporation of New York and the Bill & Melinda Gates Foundation announced on October 11 a $60 million *Schools for the New Society* investment in seven urban districts – Boston, Worcester, Providence, Chattanooga, Sacramento, San Diego, and Houston – to "reinvent the high school experience for more than 140,000 students in more than 100 schools."

What changes in the high school and in its supporting facilities and technology will be needed to "reinvent the high school experience"?

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 you 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.

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, and especially educators, and they will come up with a similar list. Here's what the 200 educators from the U.S. and Europe said at Alan November's 2001 summer institute:

- *I felt no influence and control over my learning.*
- *I was one of the herd. There was 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 when they 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?

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In the summer of 2000, 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 colored 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.

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, Workspace, 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."

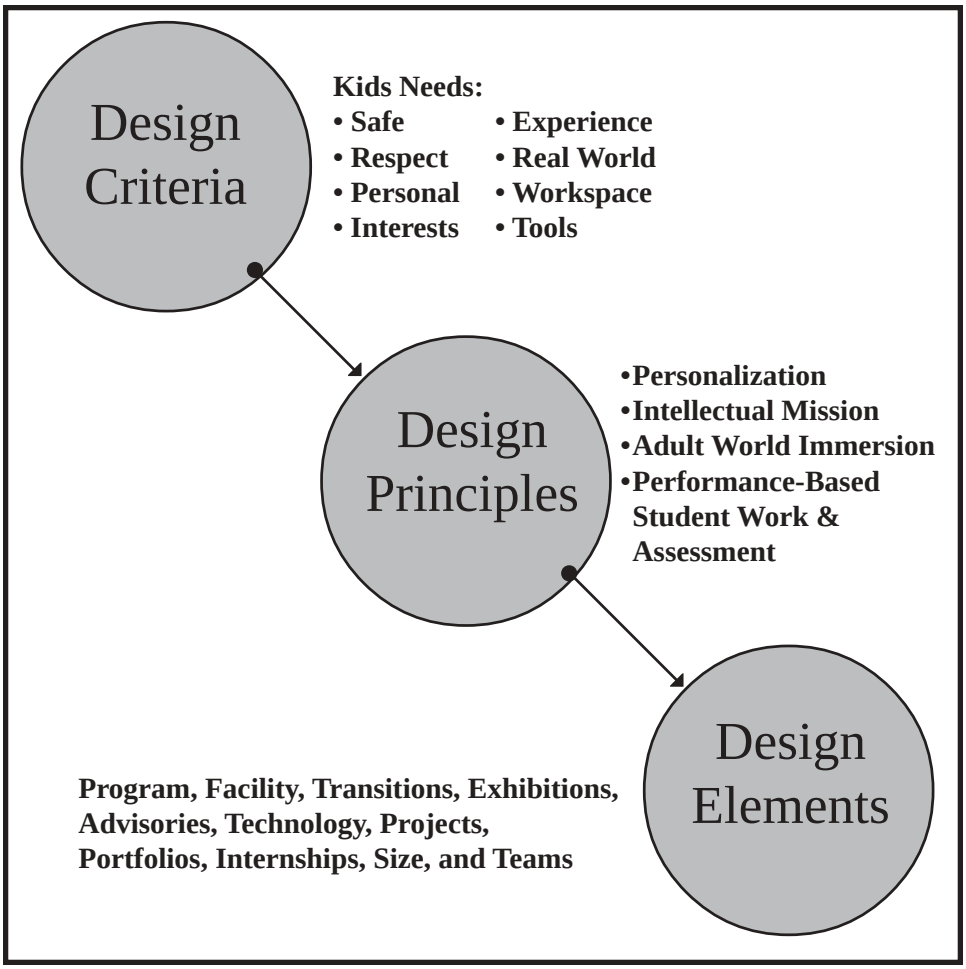
Over the past decade many educators have been at work to redesign the American High School. They have captured these design criteria in what are called Design Principles. In the *New Urban High School Practitioner's Guide* (1998), the New Urban High School project articulated these key principles as Personalization, Intellectual Mission, Adult World Immersion, and Performance-Based Student Work & Assessment (see *http://www.bigpicture.org/NUHSPractitionersGuide.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. In turn, these design elements require innovative facilities and technology to support their programmatic designs. These are lab schools from which one can learn a tremendous amount. While each design is highly replicable, it takes real educational entrepreneurs and leaders to put these in place.

This article will discuss all three schools, but will focus more in-depth on San Diego's High Tech High to illustrate how facilities and technology support the design principles and student learning.



The MET High School

The MET High school *(http://www.met.state.k12.ri.us/*) opened in 1997 in Providence, RI, founded by Dennis Littky and Elliot Washor. The initial site for 100 students was housed at the downtown Sawyer Building. A second small MET of 100 kids opened in 1999 on Peace Street, in a remarkable facility that includes classroom workrooms, project rooms, advisory rooms, and a large common room. Four additional small schools will open in Fall 2002 on a common campus using a similar facility design for each small school.

Each 100 student site "small school" at the MET has eight teachers in four learning groups and 8 advisory groups. The small size is aimed at personalizing student learning. A key slogan at the MET is "One Kid At A Time." The Teacher/advisor works with 12 kids for 4 years and focuses on each kid as an individual.

At the MET the curriculum is Learning Through Internships (LTIs) that are based on the student's 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 mentors to develop their own personal learning plans. 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.

Napa New Technology High School

Napa New Technology High School (NTHS) also opened in 1997 (*http://www.newtechhigh.org*) serving students in Grades 11-12 from two feeder high schools. 200 students attend the school for 1/2 a day, but many hang around longer. Napa New Tech may be a remodeled elementary school facility, but it looks like a workplace, not a school. NTHS Director and Principal Mark Morrison calls it "a high-tech, high-touch learning environment."

Technology is integrated into every class, courses are interdisciplinary and project based, and each student graduates with a Digital Portfolio. Students take a New Media course which gives them the skills to use powerful authoring and presentation technologies in all their work. In the senior year, each student does a year-long internship in a local business, many of them technology or related companies, and also completes an on-line Internship Project "Work Summary" about that experience that will become part of the professional digital portfolio.

Students also are required to achieve seven learning outcomes: technological literacy, collaboration, critical thinking, oral communication, written communication, citizenship and ethics, and career preparation.

High Tech High

San Diego's High Tech High (HTH) opened in 2000 and is now in its second year (*http://www.hightechhigh.org*). The school was conceived by and launched by a coalition of over

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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 focusing 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 (MA) 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 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, has a very high ceiling above the student workstation suites. Artwork and glass walls are everywhere. So is wiring, neatly routed in visible overhead cable trays and conduits. Classrooms, which HTH calls seminar rooms, look different as well, with flexible furniture and Smart Boards on the wall. Not a lot of teachers are presenting in this environment.

The Great Room at HTH

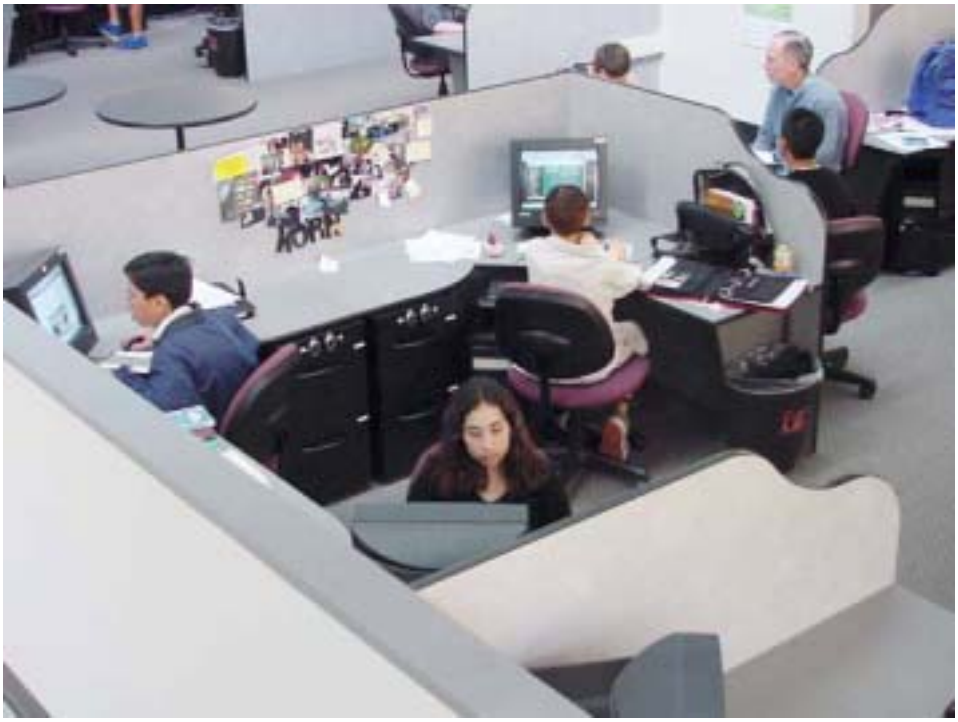
Mostly it's the students who present their work and ideas.

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

1. Workstation suites, where they have their own personal computers.
2. Project Studios, where as part of a team they can plan and construct 3-D models
3. Construction Labs (Biocom Technology Lab, Animation Lab, Engineering Lab)
4. Meeting/presentation spaces for visiting lecturers, mentors, and site supervisors

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 70-100 students, each with 5 teachers or support people. Each teacher has 20 kids in an Advisory Group with whom they stay the entire time they are at HTH. The advisories 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.

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.



Workstation Suites at HTH

HTH is a learning environment peopled by scores of adults. Speakers and outside experts are constantly brought in as student resources. Brown bag lunches with visiting speakers take place all the time. Students experience adult immersion in both their internship 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 the entire 4 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).

Technology's Role

Technology is a critical component to supporting every aspect of the HTH program and design. 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 "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. Teachers each have phones, computers, and their own office cubicles. Students and Teachers have ubiquitous access to exhibition technology in every seminar room and 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 & 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 CDRWs, and 84 more client machines, high-end PCs and Macs. Animation lab computers have Video Graphics & 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.

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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

The Student Workplace

High Tech High, the MET and Napa New Tech High are above all workplaces for students, similar to today's workplaces of the New Economy. Students are empowered at these small high schools 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. Kids Who Know and Do is the name we gave to the Autodesk Foundation's annual project-based learning conference, held in San Francisco and now sponsored by Co-nect (see *http://www.kwkd.net)*.

These kids have the spaces to work in and learn – individual 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 versions 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 will provide students with the workspace and technology tools to do their work. ▲ ▼

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You can hear Bob at Alan November's Summer Institute 2002, Building Learning Communities: Empowering Teaching & Learning and Leveraging Technology, July 23-26, at Regis College. Go to http://www.anovember .com for more information.

Metropolitan Regional Career and Technical Center (The MET), Providence, RI

InterMET, the web site of the Metropolitan Regional Career and Technical Center (the Met) ***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, designs break-through public schools, researches and replicates new models for education, trains educators to serve as leaders in their schools and communities, and actively engages the public as participants and decision makers in the education of our youth. ***http://www.bigpicture.org/***

Materials about the MET and the Big Picture Company ***http://www.bigpicture.org/materials.htm***

Building on Experience: Education Week, Bess Keller, 5/3/00
http://www.bigpicture.org/EdWeekAPNov2000.htm

Converge - A New Model of Connected Learning
Converge Feature By Justine K. Brown Photography by Stanley Rowin A NewModel of Connected Learning Dennis Littky and Elliot Washor always dreamed of building a new type of high school. Throughout his many years in public education as a teacher and administrator, Washor felt that high . . . .
http://www.convergemag.com/Publications/CNVGJan00/MetCenter/FeatureMetCenter.shtm, 29794 bytes

Converge January 2001 - Digitopolis
Elliot Washor CHANGING VISION "Where did I get my vision? Different places. From the time I was very young, and I saw a lot of inequality and injustice about how . . . .
http://www.convergemag.com/Publications/CNVGJan01/digitopolis.shtm, 41795 bytes

Forty-Three Valedictorians: Graduates of the Met Talk about their Learning, Adria Steinberg, Jobs for the Future 10/18/00 ***http://www.bigpicture.org/MaterialAdriaSteinberg.htm***

High School Will Never Be the Same
Reformers are pushing for a curriculum that uses technology to prepare students for the New Economy ***http://www.businessweek.com/2000/00_35/b3696053.htm***

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Napa New Tech High School, Napa, California

Napa New Tech High Web Site ***http://www.newtechhigh.com/***

If We Can Do It, Anyone Can!
Converge Magazine, October 1998
http://www.convergemag.com/Publications/CNVGOct98/newtechhigh/newtechhigh.shtm

Side-By-Side, Converge Magazine, April 2000
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, May 2000
http://www.gcn.com/state/vol6_no5/com/706-1.html

Technology Works! Technology Success Stories: Napa New Technology High School
http://www.siia.net/sharedcontent/divisions/education/stories/napa.html

From High Tech High School to Hot Jobs
http://www.techtv.com/moneymachine/jobscareers/story/0,3666,2235925,00.html

Frustrating New Tech? (story from Germany)
http://www.schulforum.ch/2reform/internet/frustrating.html

Congressional committee held a field hearing at New Technology High School (Information about NTHS for the Committee) ***http://www.aufdenspring.com/conghear.html***

High Tech High, San Diego, California

1. High Tech High web site at ***http://hightechhigh.org/***

2. Business Week article on High Tech High at ***http://www.businessweek.com/2000/00_35/b3696053.htm.***

3. Governor Davis's press release on his visit to High Tech High Monday for the HTH dedication at ***http://hightechhigh.org/old_site/documents/govdavispressrelease26oct00.htm***

4. "San Diego Charter School a Model for Technology Leaders", New York Times, November 1, 2000 ***http://hightechhigh.org/old_site/documents/nyt1nov00.htm***

5. Gates foots bill for tech high schools: Concept behind High Tech High gains hefty foundation support (San Diego Union Tribune)
http://hightechhigh.org/old_site/documents/sdut15nov00.htm

Press Release: High Tech High Receives $6.4 Million from the Bill & Melinda Gates Foundation Foundation grant to support the development of technology high schools designed to help all students achieve
http://www.gatesfoundation.org/education/schooldistrictgrants/announcements/announce-314.htm

6. High Tech High: cutting edge By: Maureen Magee, Staff Writer, San Diego Union-Tribune 26-Sep-2000 Tuesday ***http://hightechhigh.org/old_site/documents/sdut26sep00.htm***