Building 21st

by Sandy Cutshall, Techniques Contributing Editor

School construction is on a fast track across the country. Hundreds of successful school-bond issues have recently meant major changes in the future of American schools. Increased enrollments, the desire for smaller class size and the deteriorating condition of many existing buildings are driving a $500 billion boom in new construction over the next decade.

At a time when record sums are being spent on school buildings, it is vital that there is discussion and some general agreement on how that money is best used.

Many of the issues facing academic facilities are not dramatically different for career and technical schools. However, there are definitely some specific challenges—such as the cost, upkeep and upgrading of equipment—that are particularly tough in career and technical education (CTE).

The average school in use today is 42 years old, and most vocational/technical schools were built in the 1970s. Back then, many programs needed large lab spaces, such as auto body repair classes requiring paint booths and service bays to accommodate vehicles and related repair equipment. Although these traditional classes remain important to CTE, the rapid advances in technology and changing face of the job market have meant that career and technical schools need to change as quickly as the economy they intend to support.

The demand for new high-tech programs coupled with different states’ requirements for more traditional classes folded into the CTE curriculum has forced many school districts to re-evaluate the needs of their facilities.

**Career Tech Challenges**

According to Mike Dingeldein, vice president of the American Institute of Architects (AIA), “Flexibility is important for today’s career technical education programs.” He points out: “The turnover rate in programs is higher. Tech schools must be nimble to meet the needs of today’s students.”

Interest in information technology programs has “exploded” with the increased demand for these professionals, and all CTE schools have a need for more traditional classroom space, he notes.

Dingeldein is an architect with Steed Hammond Paul, an Ohio design firm that has been instrumental in developing the standards for facilities to qualify for Ohio School Facilities Commission (OSFC) funds. The state of Ohio is a leader in the process of planning how best to update their career tech schools.

“They need to be plug and play,” says Dingeldein, noting that the rapid turnover of programs means facilities must be easily converted as needed. This concept is reflected in the OSFC standards that he helped to develop. The committee toured facilities throughout the state and researched trends before making its recommendations, which are designed to augment OSFC standards for traditional schools.

“When designing a conventional school, the space typically drives furnishings and equipment,” says Dingeldein. “But for technical schools, the equipment and furnishings such as machine tools and computer equipment drive the space. In essence, you design around the required equipment, which can cost more than the space.”

**Case In Point**

Another Ohio architectural firm, TRIAD Architects, is helping to change the face of career and technical education through large-scale renovations and additions to the Eastland Career Center in the city of Groveport.

According to TRIAD Architectural Designer Joey Ottman, the project designer/manager, the Eastland project is about changing the school’s image into a “21st century learning environment” and letting students feel immersed in the future of industry, technology and business.
Century Schools

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Background Photo: Entrance to South-Western Career Academy

Top: Computer rendering of Eastland Career Center's new electrical technology building. Left: Interior image of the front entrance. The building is currently under construction.
The project is broken down into six phases to take place over a four-year span. One phase, for example, included extensive renovations to the school’s cosmetology lab—creating something far and above what most facilities offer students.

“The lab remodel was designed to provide cosmetology students with hands-on work experience in a visually stunning salon environment,” notes Ottman. He says the changes included 24 custom-designed stations, seven custom-designed mobile manicure tables and a separate facial room. An exposed ceiling and contemporary lighting accent the space.

Eastland Career Center Superintendent Ross Dunlap feels that this update will send a clear message of change. “Current labs are being remodeled to reflect the state-of-the-art technology that our students will encounter in business and industry environments. Every aspect of the design has been carefully planned to maximize each student’s exposure to technology and simulate as closely as possible what he or she will experience in today’s high-tech workplace.”

Other updates included in this phase were renovations to the horticulture lab, including a new greenhouse, “retail” entrance, a remodeled classroom, and a new office and computer lab. Also included were renovations to the agriculture/mechanic lab, dental lab and exterior green space and paving.

“Image is perception and perception inspires pride,” says Ottman. “Students take pride in their education and the facilities in which they attain that education. Why shouldn’t the built environment reflect the forward-thinking ideas that are being taught in the classroom? After all, you need to get the students inside. Blow their minds with an amazing environment and support it with the education within.”

**Partnering is Key**

Partnerships between local businesses and career tech schools improve educational opportunities at a school, most
specifically by supporting the best equipment and facilities for students. By relying on industry advancements demonstrated by business partners, schools can confidently and accurately train students in the latest technologies.

In Ohio, Steed Hammond Paul has put in place a process known as "Schoolhouse of Quality," meant to engage the business community to help in the planning of new career and technical schools. These plans involve both the design of the building and what goes on inside it. The Curriculum Interest Survey, part of this process, helps by determining the degree of interest and need for certain programs. When given to businesses in the South-Western City School District near Columbus, the Curriculum Interest Survey helped the district adjust their program offerings to fit the needs of their community.

In one such case, South-Western's new 700-student career academy, which opened last September, houses a fully functioning travel office operated by AAA. In a win-win arrangement typical of school-community partnership, students in this program are given real-world experience in the travel and tourism industry—and AAA will ultimately have access to fully trained employees.

"Business leaders and parents just love this," says Kirk Hamilton, superintendent of the South-Western City School District. "It communicates that the district is serious about providing programs in tune with the real world."

Likewise, the Escambia County School District in Florida developed a similar

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partnership with Cisco Systems. Cisco provides access to current equipment while building relationships with young people who could one day choose to join the company’s workforce.

According to Steed Hammond Paul Community Research Manager Todd Schneider, “The district knew they needed to get the business community involved to ensure a successful vocation school, so they partnered with Cisco Systems. They made the building more accessible to the local businesses, adding visitation rooms where their partners can make phone calls, access the Internet and review student portfolios.”

Going High Tech

The tech schools of the future are being created today—from middle schools to community colleges and beyond.

- **A showcase for school design.** Some very impressive pre-engineering high schools in the state of New Jersey exist in the county vocational systems in Monmouth, Bergen, Union, Hudson and Middlesex counties. These include such facilities as High Tech High in Lincolnt—a New Jersey Star School and Best Practice Award Winner for 2002—boasting state-of-the-art electronic equipment. Other schools of note are the High Tech High school in Hudson County, an urban model, and showplace magnet schools in Union and Bergen counties. Unfortunately, another project in that state—the proposed New Jersey Institute of Technology (which was in the planning stage)—was recently scrapped due to state budget cuts. The conceptualized facility would have accommodated about 500 high school students who would attend an integrat-ed program in math, science and engineering. Middle school students would have rotated through as well.

- **New technical education facility is itself an education tool.** A new tech ed center at Daytona Beach Community College stands as a “cost-effective architectural expression of the nation’s school-to-work reforms.” The 155,000-square-foot Advanced Technology Center (ATC) integrates HVAC systems, data networks and other building systems into the technical education curriculum. The building’s rotunda and atrium, set up as the central gathering space, reveal a number of building systems, including two stories of data closets showcasing the server racks where 80 miles of cable terminates. The building’s designers go as far as to suggest students can take field trips within the facility itself. Additionally, the 90,000-square-foot industrial shop area houses high-bay shops for studies in construction, information, automotive and manufacturing technologies.

- **Even middle schools are changing.** Beadle Middle School in Omaha, Nebraska, is the newest addition to its district—and a place where sixth, seventh and eighth graders are using robotics, global positioning systems, weather stations, virtual reality and computer-aided design. The rest of Millard Public School district has followed suit, with all five of its middle schools boasting updated equipment and technology centers similar to that at Beadle.

Coming Trends and Design Ideas

According to a report last year from the National Clearinghouse for Educational Facilities, there are 10 educational trends that should shape school
planning and design for the future:
1) The lines of prescribed attendance blurring;
2) Schools becoming smaller and more neighborhood oriented;
3) Fewer students per class;
4) Technology dominating instructional delivery;
5) The typical space thought to constitute a “school” changing to something different;
6) Students and teachers being organized differently;
7) Students spending more time in school;
8) Instructional materials evolving;
9) Grade configurations changing; and
10) Schools disappearing before the end of the 21st century (“Or will they?” the authors ask.)

American School and University magazine published an article a few years ago noting their top design ideas for a school of the 21st century, some of which are: taking a fresh approach to classroom furniture and layout; creating larger physical classroom spaces; the infusion of technology with computers, especially portable laptops to be found everywhere and not just in computer labs; technology to be more streamlined and integrated; classrooms to house a variety of science and lab activities, including aquariums and all sorts of natural exhibits; and schools to be flexible and highly efficient.

The authors say that, “Educational facilities must be physical environments where innovative educators can create programs that address the needs of an increasingly diverse student body.”

With interesting, state-of-the-art facilities, the ability of teachers to reach all students is enhanced and students enjoy spaces that provide a nurturing and stimulating environment.

However, the schools of the 21st century will need to be—above all—more student centered and more personalized in programs. Thus it will take flexible team learning areas and classrooms, as well as the latest equipment and facilities, to cultivate students’ individual learning styles to everyone’s benefit.

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