Facilities for 21st Century Learning

Ideas for 21st Century Facilities

Aesthetics

The indoor and outdoor structures and spaces of the school should be aesthetically pleasing and healthful settings. The facility should be inviting to the students, making them feel that the space is special, and therefore emphasizing that each individual is important. Aesthetics that affirm the value of the individual must be stressed, with spaces for the admiration of the accomplishments of the students and others. The school should be a place for academic success, high self-esteem, social interaction, and physical safety. The facility layout should be especially easy to comprehend and should reflect how classes relate to one another to minimize the feeling of being “lost,” which is common in students. Spaces should be provided for socialization among students and with teachers. Spaces should also be provided to display student work.

Planning Principles

Following are planning principles employed by other districts when developing school facilities and sites:

• Building orientation is important. The obvious focal point is the main entrance. The front of the building should be visible to the public.
• Good signage is important including a marquee board with directions on how to find entrance and location within the facility and good directional/informational signage inside and out.
• A welcoming area should be by the front door. The welcome area should be open, using spacious hallways and common areas.
• Create easy access for parents/community.
• Use pleasing, warm, inviting, soothing colors.
• The building should be visually appealing, both internally and externally.
• Provide adequate lighting; natural skylights, glass, windows, and open areas.
• Feature student art work – several showcases around school to promote student achievement.
• Use complimentary carpet and tile mix appropriately used throughout the building.
• Equip student spaces with technologies for student use.
• Maintain landscaping.
• Hide the dumpster from view.
• Separate access drives for deliveries.
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Community Use

It is assumed that the schools are used for a variety of community uses. Community involvement in education can take a variety of forms before, during, and after the school day. Additionally, the school will not have to pay for space elsewhere for banquets, PTA events, retirement events, and student recognition events, if community spaces are available.

Generally in planning schools designers think of “Community in the School” but in considering all the community resources designers should also consider opportunities for “School in the Community” especially since these schools are located on military installations. The following is a partial list of potential community uses:

- Adult training
- Computer access
- College/graduate courses
- Dance recitals
- Public meetings
- Banquets
- Dances/proms
- Alumni reunions
- Professional development
- Clubs and organizational meetings
- Intramural sports
- Summer programs
  - Music
  - Athletics
  - Academics
  - Outside agencies
- Space for churches, arts groups, and sport events

The areas that have the greatest possibility for community usage include:

- Gymnasiums
- Cafeterias
- Media Centers
- Conference rooms
- Foyer/entrance
- Playing fields
- Parking lots

Special considerations include:

- Disaster and emergency use
- Design of the facility and site to enhance parking and circulation, security, and energy conservation
- Adequate signage to assist community members
- Layout of community use areas in a “user friendly” design
- Storage for community functions – gym; auditorium; community use

- After-hours lighting for parking areas
- Extended hours – (6 am – 3 pm typical day vs. 7 am – 11 pm for community use)
- Separate “Public” entrance for after school activities – access to gym, auditorium, cafeteria, media center/college and career center

Community Support

Many schools rely on volunteers to participate in tutoring and mentoring programs that take place in the school facility. It is important to configure adequate space for these programs. For instance, where does a volunteer tutor sit with a student, or small group of students to conduct tutoring? Is there a specific place for this to occur, or is the volunteer in the hallway or stairwell? Where does the volunteer put his or her belongings? Tutoring space can be provided through small group rooms adjacent to classrooms or through conference rooms located in each pod. Adequate parking spaces should be provided for volunteers in the visitor parking lot.

School in the Community

The DoDEA schools are unique in that they are located on military installations. The military base has the potential of providing auxiliary facilities that are seldom available to schools located elsewhere. For example, a military base includes extensive physical training facilities. Military installations also include various laboratories, research facilities, and sophisticated technical equipment. This provides the opportunity for rich internship/mentorship programs and for individual student projects and class visitations.
At the high school level there is a desire for Junior ROTC programs. Military installations provide an opportunity for real life ROTC experiences.

Many of the DoDEA schools are located in foreign countries. Through partnerships with host nation schools, museums, government, business and cultural organizations, rich educational experiences can be provided.

Community involvement should be taken into consideration in the initial planning of the building and not treated as an afterthought. Creating this synergy requires a great deal of initial planning and can significantly affect the layout and organization of the building and site.
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Facility as a Teaching Tool

Every square foot of the building and the grounds can be seen as an educational opportunity. Giving students an understanding of how the school building works can foster their sense of ownership and engagement with their learning environment. There are many ways that the building can be a teaching tool; the list of ideas below serves as a starting point for identifying these opportunities.

Building/General

- Make systems visible, especially in gathering/assembly areas – open structure can give opportunities to show the structure and systems of the building.
- Provide windows into spaces such as the mechanical room. Label the piping and equipment and provide information on how these systems work.
- Provide signage around the school describing sustainability, technology, utility systems.
- Open up a section of wall to show how the utilities run through it.
- Provide a learning street to show how the building works and display student projects.
- Identify indigenous plants used in the landscape.
- Make connections to natural resources – how many natural resources go into a book?
- The school can be presented as a “body”: consider an “Operation Game” in which the data/electrical wiring represents veins, HVAC represents lungs, and the building structure represents bones.

Energy/Utilities

- Have the students give tours of the building – the building teaches the students – the students teach the visitors.
- Highlight local culture or the legacy of who the school is named for.
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“dashboard” display in a prominent area which would provide information on the energy usage of the building.
- The dashboard may also be connected to demonstration solar panels or wind turbines specifically for educational use.
- Install solar charging stations for laptops and handheld devices.
- Meter the different wings or areas of the building separately: when the wing goes red, students find out why; making a competition out of it engages students at a new level.
- Sub-metering can provide ways to give the students data they can use to monitor the energy usage of the building.
- Allow students to have some control over the settings on window shading for lessons on daylight and energy usage.
- With building systems becoming more and more complicated and integrated, provide simple signage that explains how and when to use the system.

High Tech High, San Diego, CA
• Install a photocell that turns green when light levels are low enough that supplemental lighting is needed; this gives students the “green light” to flip the light switch on.

• Use rainwater harvesting to demonstrate the water cycle.

• An external gauge on the cistern will allow students to monitor the water level.

• Clear piping can be provided to see the rainwater flowing to the rainwater harvesting system.

• Spillways or troughs may be used as water features when utilizing the harvested rainwater for irrigation in an outdoor classroom.

• Explain Low Impact Development (LID) features used at the school and their connection to the water cycle and responsible stormwater management.
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Flexibility of the Learning Environment

Today, students do not just work in groups of 20-25. As technology continues to advance, students are becoming more involved in extensive individual learning activities that are supplemented by small group (2-6 students), moderate group (10-20), and large group (50-150) activities. Space should be provided for students to plan, work independently and collaboratively, and give and/or receive tutoring as well as accept instruction.

Modern office environments provide greater insights into flexibility than current school environments. Many of their concepts should be taken into consideration:

- Demountable, movable wall systems
- Modular furnishings
- In-floor wiring
- Wireless internet access
- Non-load bearing wall systems
- Raceways, cable trays
- More generic space that can be adapted to specialized uses
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Health and Wellness

Food, nutrition, health education, and physical activity are significantly important in the lives of students and are incorporated into their daily lives at school. Increasingly food courts are featured in schools to provide fresh food with a variety of healthy choices. Food can be prepared centrally and served centrally, or distributed throughout general learning settings in the school. In schools with a culinary arts program, this program is often collocated with the food service functions. Common concepts in 21st Century schools include a combined cafeteria and auditorium—benefiting from the large space required for each. This concept offers an advantage for community access for functions that are shared with the public. Similarly, the information center is sometimes located within the space of the cafeteria dining area.

The gymnasium, outdoor play lots, and playgrounds provide the customary opportunity for physical activity for students at school. A gymnasium with a full-size basketball court can provide movable seating with sufficient capacity for the entire student body. Space for professional development for coaches is also provided. Some schools include a fitness center to supplement the traditional opportunities for the students’ physical development.

Markham Woods Middle School, Lake Mary, Florida, Photo credit: George Skene, Orlando Sentinel

Burton Elementary and Middle School, Progressive Architects, Grand Rapids, MI

Adlai E. Stevenson High School, Cannon Design, Grand Rapids, MI
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Outdoor Learning Opportunities

Design Considerations
- Separate faculty, visitor, and kindergarten parking.
- Separate kindergarten and main entrances.
- Separate drives for parent drop-off and buses.
- Provide a blacktop area.
- Provide exterior lighting.
- Provide fire vehicle access.
- Provide aesthetically-pleasing fencing.
- Provide a service entry.
- Provide a delivery entrance with access to kitchen.
- Maintain landscaping.

Lighting
- Include exterior security lighting with motion detectors and/or photo-cell timer for parking lots and the exterior of the building.
- Provide appropriate lighting for walkways.
- Provide lighting that is easy to maintain and secure against vandalism.

Traffic Flow
- Separate bus and parent pickup areas.
- Car, bus, and service vehicle traffic should be separated.
- Consider access by fire department emergency vehicles when planning site circulation.
- Provide drive-up access for large items in areas such as food service and janitorial/maintenance.
- Provide a drop-off for special education buses/vans.
- Provide sufficient length in the drop-off area for bus stacking.

Regular Parking
- Visitor
- Staff
- Student

Event Parking
Event parking is not an everyday occurrence. Some parking will be accommodated in regular lots. Other parking might be on paved play areas, fields or roads.
- Adequate and separate parking facilities should be provided for visitors, staff, and kindergarten parents.
- Comply with regulations for handicapped access.
- Provide bicycle racks.
- Provide security cameras.

Landscaping
Create landscaped areas that are sustainable using natural rainfall and minimize use of an irrigation system where possible.

- Provide low-maintenance landscaping plantings.
- Consider outdoor spaces as an extension of the classroom and opportunities for exploration and education.
- Outdoor spaces should be student-friendly with places to rest and read, and trees for shade.
- Benches around trees can encourage students to stay outdoors.
- Sufficient green space should be provided.

Playing Fields
- Baseball field
- All-weather track (if possible)
- Football/soccer field
- Band practice area (high school only)
- Storage for outdoor athletic equipment
- Fencing where appropriate
- Irrigation and lighting
- Drinking fountains

Winfield School Addition, FGM Architects, Winfield, IL

Mason High School, VSWC Architects, Mason, OH
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