Best Practice in Action: Six Essential Elements that Define Educational Facility Design

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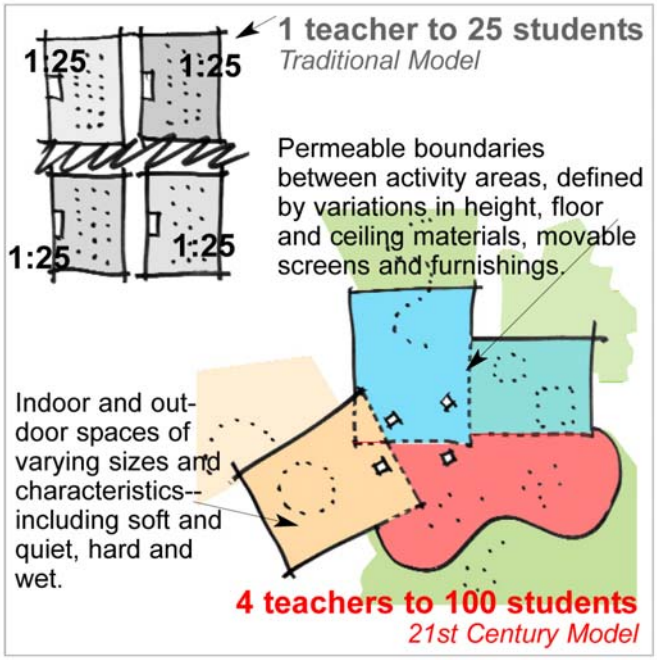
Until recently, educators and architects have lacked clear criteria for evaluating educational architecture. Planning teams have struggled to find or invent effective models, without a common language of design. Fortunately, a substantial , readily accessed database of educational architecture over the last decade has resulted in a rapidly emerging language of best practices for planning and designing 21st century schools.

The emerging language of educational design supports both the foundational skills of literacy and numeracy, along with the demands of a global economy, which require that learners are curious, self-directed, and able to work across platforms. Six aspects of best practice offer essential elements that support the requirements of any contemporary educational framework:

1. Supporting teaching and learning
2. Maximizing physical comfort and well being
3. Demonstrating environmental responsibility
4. Serving the community
5. Establishing design principles that make buildings work better, last longer, cost less to renovate and maintain, and inspire and adapt to changing needs
6. Applying open, transparent and collaborative processes that allows the school and community assume ownership of planning and design



From 1 teacher to 25 students to 4 teachers to 100
Design Patterns for 21st Century Schools

1. Supporting teaching and learning: *changing the paradigm from "turf-centric" classrooms to collaborative, interdisciplinary centers of excellence*

The old paradigm of one classroom and one teacher for 25 students compares to isolated Middle Ages fiefdoms. Rather than classrooms designed as "turf-centric" castle walls and moats, a new paradigm of four teachers to 100 students in a more fluidly designed environment creates new learning opportunities:

- Quieter spaces for individual reflective study
- Stimulating "watering holes" for collaborative projects and social learning
- Flexible studios with access to water, walls opening up to outside project areas, and inventive, experimental projects spaces
- Outdoor learning areas with adjustable sun filtering elements, rain protection, exterior storage, and electrical power

- Mobile furniture, including storage elements, student and teacher presentation lecterns, easel-marker boards, media carts
- Flexible screens and acoustically absorptive partial height walls
- Display and presentation surfaces accessed and reconfigured daily by students

At Western Heights Secondary College (grades 7-12) in Geelong, Australia, corridors and classroom walls were removed and reconfigured to create flexible, 100-student team areas for the 7th grade class. While minimal structural and finish changes were made, direct access to outside spaces and ample natural light were emphasized. Student surveys showed improved student morale from 17% for students in the older, individual classroom to 80% in the newly configured areas. Teacher effectiveness jumped from 20% to 87%, and connectedness to peers from 20% to 85%. The bottom line: even rapidly developed renovations can have a profound effect on learning with *measurable outcomes. (Data and photo courtesy FNI's Melbourne partner Patrick Architects).*

Western Heights Secondary College, Australia

2. Maximizing physical comfort and well being—*feeling good and fitting in*

Shelter from the extremes of cold, heart, humidity, and access to fresh air are 'base line' requirements in any school design. Newer criteria extend beyond these:

- Daylighting in all appropriate learning spaces
- View windows (with minimum 50 feet vistas) to landscapes, streetscapes or activities
- View windows scaled to student ages and sizes
- Operable windows, allowing for control of ventilation and fresh air
- Access to food and beverages throughout the day
- Availability of comfortable seating and individual reflective spaces

A hierarchy of spaces and group sizes—*a key element of comfort and security*

Architectural elements can be designed to foster each of the relationships noted above. Window seats, niches, alcoves, lowered ceiling heights, movable screens, and changes in floor textures all serve to define individual and small group spaces. Differing qualities of light, acoustically hard/soft spaces, orientation to vistas, and openings to landscaped areas further distinguish one space from another.

Due to primal needs often overlooked by traditional school design, many students tune out school while tuning into environments and systems outside of our influence. Learners need to answer affirmatively to the following key questions if they are to becoming engaged learners in the future:

- "Do I fit in?"
- "Do I have any friends?"
- "Do people care about me?"
- "Are there adults in my life that I can trust?"

A hierarchy of spaces and groups remains one of the most vital aspects of comfort and security. In surveys with many school districts that Fielding Nair International (FNI) is working with today, the data on student well being and engagement is a dismal 25% vs. expected norms. Thoughtful design of the site and facility enhances the sense of belonging by proving spaces for a layered hierarchy of groups, including:

- Individual-scale spaces—from a rocking chair or cubby storage space for a pre-kindergartener, to a personal workstation for a middle or senior school student
- "Family or extended family" scale spaces accommodating advisory groups, home units, or project teams of 10, 15 or 20
- Small learning communities of 100 to 150
- Neighborhoods of two or more small learning communities
- Multiple small learning communities and neighborhoods across campus

3. Integrating Learning and Sustainable Systems—*"The Three Sisters"*

At the Morris Center in Long Island, New York, elementary students tell the story of the "Three Sisters," a Native American tale about the interdependence of corn, pumpkins and beans. In a student-built teepee, students explain how corn supports the twining bean vines, beans fix nitrogen for the corn and pumpkins, and pumpkins cover the ground to prevent weeds. Students plant, water and harvest all three vegetables in an organic vegetable garden adjacent to the teepee. They learn about photo-synthesis, counting and measuring, history, and story-telling while they observe first hand the key principles of ecology and interdependence.

Morris Center, New York

The teepee, garden, and story of the three sisters offer a seamless integration of learning and sustainable systems. There are countless opportunities for integrating ecology onto a building, including:

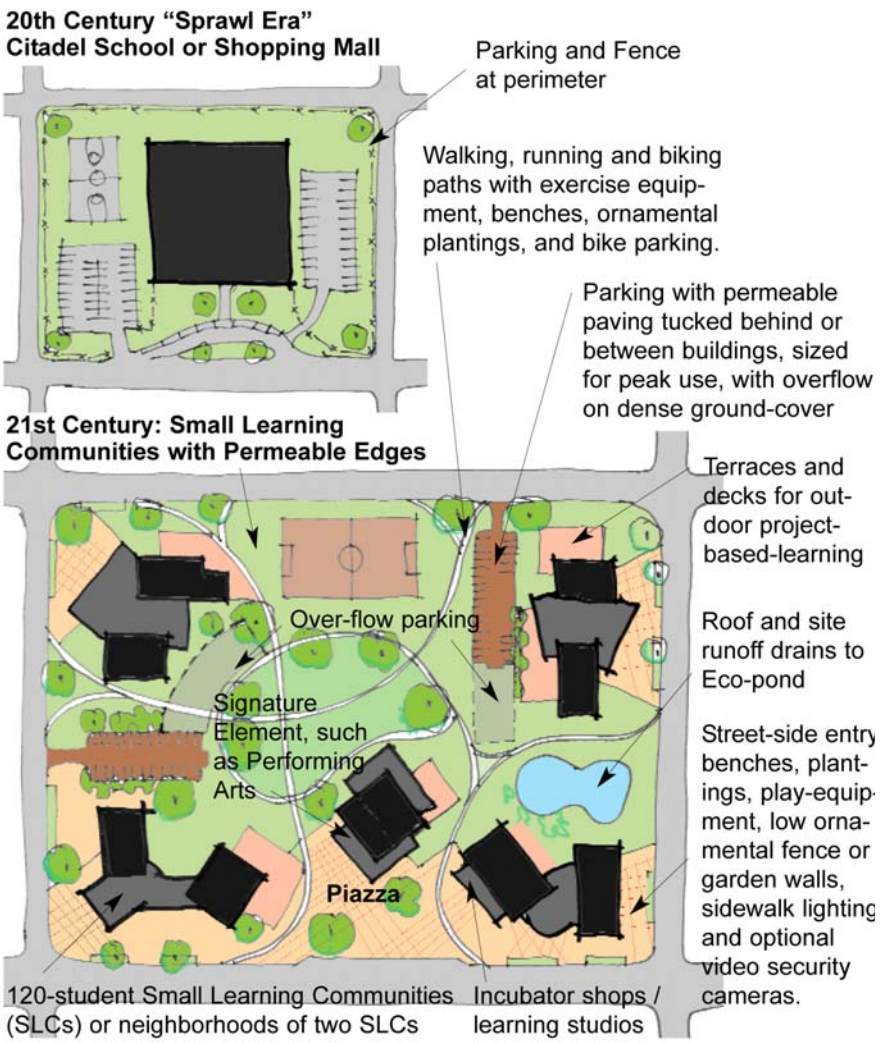
- Harvesting rainwater from roofs and site run-off, collected in cisterns with visible gauges, illustrating connections between rain and water supply
- Nurturing "kitchen gardens" adjacent to teaching kitchens and cafes
- Utilizing water-pumping wind mills from low points on the site to eco-ponds
- Harnessing solar collectors attached to light posts with gauges illustrating the kilowatt gains per hour based on weather patterns

In Mawson Lakes, South Australia, ten-year old students open up laptops to monitor classroom and building temperatures, adjust temperatures remotely by activating motorized windows, and turn on solar-panel ventilation fans which form signature towers over the school. Students can tell you at any time how much electricity has been generated by the solar panels, how much is utilized to power the school, and how much is sold back to the gird at any time.

4. Connecting School and Community—*beyond the shopping mall*

Tomorrow's citizen belongs to communities of life-long learners, encompassing both richly textured local relationships and technically enhanced global connections. For many adults and students today, shopping malls provide the most vibrant connection outside their home. Less structured than a museum, church or library, a mall offers an opportunity to read while sipping coffee in a bookstore, experiment with the latest technology at an Apple Store, or hang out with friends at the food court.

Can we create learning communities with built-in spaces that compete with shopping malls? Absolutely! In fact, we can plan our schools to become part of a learning community that is healthier, more fun, better for our urban and town streetscapes, and accessible to all.



Site Design for Community
Design Patterns for the 21st century

Five steps to create schools that surpass the shopping mall model include:

- Upgrade libraries to Global Learning Centers. Provide community access to technology, public cafés, display spaces for student and professional work, and community meeting spaces.
- Provide "incubator" shops/classrooms/studios managed by partnerships with local and national business/organizations.
- Create outdoor amphitheaters serving student and community events.
- Provide colorful landscapes with local trees and planting, flanked by walking, running, and biking trails with stopping places for exercise equipment, water fountains, benches, and outdoor lighting.
- Take down fences surrounding our schools. Within small learning communities, the sense of ownership and care of immediate surroundings associated with small learning communities provide greater security than a fence.

Mawson Lakes Center for Life Long Learning

5. Leveraging best-practice: *"to have a good idea, have a lot of them"*

When Thomas Edison, the prolific inventor responsible for harnessing electricity said, "To have a good idea, have a lot of them," he identified a profound truth about innovation: exploring a large quantity of ideas makes for better solutions. Fortunately, we don't need to reinvent every idea—they are all around us. Access to best practice solutions in school design include:

- Asking "What works and what can we use in our school?" when taking field trips to other learning environments, including museums, ecological parks, and public plazas.
- Analyze published case studies. There are more than 400 detailed case studies with educator narratives, floor and site plans, and photos at designshare.com.
- Develop ideas through cross-pollination with other disciplines. Barnes and Noble Bookstores, with their cafes and soft, informal searing areas, are inspiring radical changes in public, university and school libraries. Formal "quiet" areas that once "shushed" students are morphing into centers of inquiry and collaboration.

One of the most powerful sources for best practice inspiration for FNI's team has been Leonardo DaVinci. Born in1452, Leonardo defined seven principles about invention and learning that can serve as the foundation for a contemporary education framework, including "Curiosita," "Dimostrazione," (testing knowledge) and "Sensazione,' (refinement of the senses).

Leonardo's model of interdisciplinary learning inspired development of the DaVinci Studio, which breaks down the boundaries between the traditional science, art, and shop classrooms. (Along with the DaVinci Studio, Einstein and Jamie Oliver Studios are being developed in schools in four countries. Background information: http://www.edutopia.org/magazine/ed1article.php?id=Art_1543&issue=jun_06)

6. Inclusive, outcome-based process—*developing and following though as a team*

Fast-track design schedules often minimize time for community participation. However, a clearly defined, inclusive process is critical to support 21st century educational frameworks. Some of the processes listed below, such as a site walk, can be completed in a half day or less

- Developing a vision linking pedagogy and facilities.
- Visit diverse learning environments. Include businesses, museums, ecological parks, artist studios, and scientific labs.
- Design pattern workshops. Learning activities and spaces are diagrammed with educators, administrators and students
- Stakeholder site walks to experience the opportunities and constraints of the site collectively
- Reading and discussion groups on both facility design and pedagogy (link: *30 Strategies for Educational Reform* at http://fieldingnair.com/edreformnair1.pdf)
- Community resource surveys. Stakeholders identify places in the community that can partner with educational institutions. Community resource surveys consider sharing facilities and social capital.
- Continuous evaluation of the design through the use of an Educational Facility Evaluation Instrument (more info at: http://www.fieldingnair.com/EFEI/EFEI.aspx)
- Educational Commissioning, including workshops with staff on how to use their facility. Post occupancy evaluations to guide continual improvement in its use (link: http://www.designshare.com/index.php/articles/educational-commissioning)

The Site Walk: An inclusive process that can be competed before lunch:

The Site Walk engages children, parents, teachers, builders, and administrators by walking, pausing at selected spots, and asking intuitive questions. Involving all ages, these can provide rich insight before you have considered the inside of the building!

Site Walk at Duke School, Raleigh, North Carolina

- Can we orient the café to the sounds of singing birds and sights of our existing landscape?
- Is there a hot dusty summer wind from the south? Can we build up and plant a mound of earth and dense hedge to deflect the hot air to either side of an outdoor learning terrace?
- Does the ground slope from one side of the site to another? Can we provide terraces with low garden walls to create outdoor breakout spaces and gentle ramps for a meandering fitness circuit through the campus?
- Is there a low point on the site where we can gather rain water and create an eco-pond, supporting observations in biology and ecology?

- Can we locate doors and walls to open up to natural vistas and lively streetscapes?

Conclusion: Innovative design answers today support global learning futures

Is your schedule and budget too restricted to allow for these six elements of best practice? Is the focus of your school or project limited to literacy and numeracy--too narrow to merit such a broad-ranging approach? Or, is your community ready to embrace a new global understanding of learning and our school environments?

Well-crafted educational frameworks require learning environments that support curiosity, as well as literacy and numeracy. Our learners must be curious, self-directed, and able to work across platforms to succeed in tomorrow's global context. Likewise, our schools must integrate a new understanding of learning for the 21st century that extends beyond traditional building solutions. Given this understanding, all six elements of best practice are essential to the creation and maintenance of innovative educational facilities.

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