

REPORT FROM THE **NATIONAL SUMMIT ON SCHOOL DESIGN**

A RESOURCE FOR EDUCATORS AND DESIGNERS

*Convened by the American Architectural Foundation
and KnowledgeWorks Foundation*



Convened by:



The American Architectural Foundation (AAF) is a national nonprofit organization that seeks to educate individuals and community leaders about the power of architecture to transform lives and improve the places where we live, learn, work, and play. Through numerous national outreach programs, grants, and educational resources, AAF seeks to inspire people to become thoughtful and engaged stewards of the built environment.

AAF's *Great Schools by Design* program supports improved quality in America's schools by promoting outstanding design of the learning environment, encouraging collaboration in the design process, and providing leading-edge resources that help schools and communities transform themselves. Throughout the country, *Great Schools by Design* engages superintendents, architects, teachers, parents, citizens, students, board members, and local government officials in a far-reaching conversation about what must be done to improve the places where children and adults learn. At AAF, we strive to help communities create schools that both support student achievement and serve as centers of community. For more information on *Great Schools by Design* and other AAF programs, please visit us online at www.archfoundation.org.



KnowledgeWorks Foundation, Ohio's largest public education philanthropy, is committed to furthering universal access to high-quality educational opportunities for individuals to achieve success and for the betterment of society. The Foundation seeks to increase the number and diversity of people who value and access education, by creating and improving educational opportunity at pre-kindergarten through high school and post-high school institutions, and through community organizations.

In Ohio and across the nation, billions of dollars are being spent on the rebuilding of our nation's public schools. KnowledgeWorks Foundation recognizes this investment as a tremendous opportunity to plan and design schools that increase public ownership of education, respond to current and future learning needs of students, and serve as centers of community. For more information, please visit us at www.kwfdn.org.

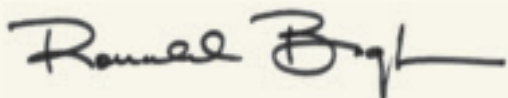
Currently, there is a tremendous opportunity to reconsider the classic American schoolhouse and the ways that our young people learn and our teachers teach. Advances in technology, educational theory, and our understanding of how students learn all lead to new ideas about what a school can and should be. It was with these thoughts in mind that we convened the National Summit on School Design.

We welcome your interest in this report from the National Summit and hope you will find it a valuable resource for your community. This report reflects the ideas, issues, and aspirations of more than 200 participants from around the country—ranging from educators and students to architects, community members, and national thought leaders—who attended the Summit on October 6–8, 2005, in Washington, D.C.

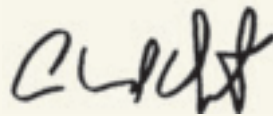
In the pages ahead, you will read about school design principles for the 21st century—ideas, best practices, and concerns on such issues as school size, technology, trends in learning, siting and location, and public process and community-school collaboration. You will learn from examples of innovative school design and community-school collaboration taking place all across America.

The Summit was designed to help energize a national discussion on schools of the future. At this critical moment, we have a unique opportunity and obligation to rethink the classic American schoolhouse and envision new school designs that will serve the learning needs of students and communities in the 21st century. Clearly, the stakes are high. Some 59 million students, teachers, and community members spend a large part of their waking hours in schools. The quality of these environments has a profound effect on their performance, health, safety, self-esteem, and well-being.

The American Architectural Foundation and KnowledgeWorks Foundation appreciate the generous support and contributions of the Summit planning committee, other sponsors, and most importantly – the participants. We look forward to advancing the work of the Summit and contributing to better learning environments and communities nationwide.



Ronald E. Bogle
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Table of Contents

Foreword: Looking to the Future	3
Executive Summary	7
<i>About Great Schools by Design</i>	11
About the National Summit on School Design	11
National Summit on School Design Participants	14
Eight Recommendations for School Design Excellence	16
1. Design Schools to Support a Variety of Learning Styles	17
2. Enhance Learning by Integrating Technology	23
3. Foster a “Small School” Culture	27
4. Support Neighborhood Schools	31
5. Create Schools as Centers of Community	35
6. Engage the Public in the Planning Process	39
7. Make Healthy, Comfortable, and Flexible Learning Spaces	43
8. Consider Non-Traditional Options for School Facilities and Classrooms	47
Next Steps: Advancing the National Agenda	51
Appendix	55
Six Key School Design Principles for the 21st Century	55
Lessons Learned: Scenario-Based Problem Solving	57
National Summit on School Design Planning Committee	65
National Summit on School Design Sponsors and Partners	66

Foreword: Looking to the Future

The American schoolhouse is becoming something new and different at the beginning of the 21st century. An evolving set of principles is transforming our thinking about what a school should look like, what its role in the community should be, and where teaching and learning is actually taking place.

In many respects, we are at a watershed moment in school design. After 15 years of furiously building and renovating schools to meet the demands of the baby boom echo, the iconic image and definition of the American schoolhouse is evolving into something new as educators and technology transform the very nature of learning.

“Learning,” as the British authors of a paper on the future of school design recently wrote, “is bursting through the confines of the school building.”¹ Learning is increasingly taking place in multiple locations as the traditional boundaries between community and school continue to blur. Schools are being sited in revamped strip malls, storefronts, museums, and downtown office buildings.

The rise of technology, the idea that learning can take place anytime and anywhere, the growth of home schooling, and the charter school movement are just a few of the reflections of this new blurring of boundaries. The rapidly growing after-school tutoring industry is another reflection of the growing realization that education doesn’t just happen in school.

Jeffery Lackney, noted author and educational facilities architect, may have summed it up best in making the assertion that “the self-contained classroom can no longer provide the variety of learning settings necessary to successfully facilitate 21st-century learning.” Indeed, the self-contained classroom may no longer be a viable paradigm for 21st-century learning.



>> *The Denver School of Science and Technology, Denver, Colo.*

Photo: © Jim Berchert, Courtesy Klipp

¹ Building Futures, “21st Century Schools: Learning Environments of the Future.” <http://www.buildingfutures.org.uk>, p.8.

There is an increasing recognition that children learn differently, that collaborative teaching across disciplines is an increasing necessity, and that the classroom of the future is a flexible set of active and passive learning zones with ample room for project-based learning. Roy Pea, director of the Stanford Center for Innovations in Learning, has suggested that students in the future will have their own pocket PCs and will be able to store a lifetime of learning on small portable devices. This vision is one more indication that learning will increasingly take place beyond the classroom.

The growing recognition that so much learning takes place outside the classroom will continue to raise questions about the value of spending billions of dollars to build schools in this new era of accountability. While educators, architects, and facility planners have made some progress in linking school design to closing the achievement gap, much more will need to be done to make a more compelling case that will satisfy voters and policy makers.

Photo: © Greg Murphey, Courtesy Perkins+Will



>> Harold G. Fearn Elementary School, Aurora, Ill.

A second central question that educators and architects are going to have to answer in the immediate future is this: how do you integrate 21st-century skills into the current K-12 curriculum, and what does that mean for school design? In a recent article, Prakash Nair from *DesignShare* noted that architects and designers need to be thinking about 18 different learning modalities—everything from team collaborative work to project-based learning.

One emerging answer is that a one-size-fits-all approach to school design is going to have to give way to a new paradigm of smaller and more diverse learning environments that give parents and students more choices and options about what, where, and how they learn.

The fact that nearly one-third of all high school students now fail to graduate also suggests that such approaches as creating smaller learning communities that attract student interest and attention may be an important way to reclaim and retain these populations. The small storefront school and drop-in center or the recording studio that became a school—like Hip-Hop High in Saint Paul, Minnesota—may be a new element of school design that deserves more of our attention.

The movement to smaller learning communities will also require a great deal of new thinking about the values of equity and fairness that have traditionally defined so much of the politics of school construction for school districts across the country. Instead of making sure that every school gets the same regulation-size gymnasium and the same number of computer labs, school districts will be challenged to come up with a new values framework for thinking about what is most important in spending their capital budgets.

Another new element to consider in school design is the reality that there are many more active participants who want a voice in how new school facilities are designed. Community-based groups, foundations, universities, mayors, and city agencies are just a few of the groups that have come to the table in the past decade to promote their ideas. This activism has led to a greater need for authentic citizen engagement and growing acceptance of shared space, shared costs, and public-private partnerships.

In some communities, the public school complex is already replacing the shopping mall as the modern-day equivalent of the village green. Communities are combining public libraries, YMCAs, health clinics, artistic centers, and public schools into academic villages that provide a wide array of learning, health, and recreational services to a broader community of citizens of all ages.

In the coming decade, educators and facility planners may increasingly be thinking about the needs of two groups that are not now in school—preschool children and senior citizens. School districts are increasingly investing in preschool and early education initiatives for their potential to accelerate learning, and much more will need to be done by the design community to develop appropriate learning places for this cohort of children.

Another boundary to cross in the near future will surely be intergenerational. As baby boomers begin to retire in massive numbers in the coming decade, it will make little sense for communities to spend \$30 million to \$50 million to build a new facility that is closed three months of the year and not open to a growing senior citizen population. In this new era of lifelong learning, educators and architects are going to have to expand their vision of who uses these facilities and be keenly aware that these aging baby boomers will dominate America's political landscape for the next twenty years.

Unless schools come to be seen as integral to the lives of those without children in school, tax dollars will slowly but surely dry up for public education. Policymakers and community leaders must encourage and expect the education enterprise to broaden its mission so that places called schools are viewed as community centers.³

Kenneth Stevenson, who has written extensively on school design trends, cites the potential clash over tax dollars between aging baby boomers and schools districts with a “new majority”² of minority students as the trend that will define the \$30 billion annual school construction industry in the coming decade.

This potential clash between well-off baby boomers worried about rising health care costs and school districts that need to provide support and extra services for a more diverse student population has the potential to have an enormous impact on how school construction is funded. School districts that need to build schools that include wrap-around support services may find themselves unable to develop the capital financing they need to build the schools they want.

Although reformers have had some success in appealing to the courts on constitutional grounds to obtain new financing for school construction, there are limits to what the courts can do. As we are seeing both in Texas and in New York, state legislatures and governors can stall and struggle for years over financing and can be more than a little reluctant to meet their obligations. This trend suggests that in the years ahead the school design community may need to pay more attention to developing alternative financing mechanisms such as Qualified Zone Academy Bonds, New Market Tax Credits, and joint-use facilities that spread the cost between a variety of public and private entities.

Educators and community leaders should also make a point of pursuing a dialogue with suburban developers. An increasing number of developers are willing to invest millions of dollars in new schools if doing so helps them expedite the building process and attract home buyers. In Stapleton, Colorado,

² Kenneth R. Stevenson, “Educational Facilities within the Context of a Changing 21st Century America,” National Clearinghouse for Educational Facilities, Washington, DC 20006, <http://www.edfacilities.org/pubs/>.

³ Ibid.

on the outskirts of Denver, Forest City Enterprises is building a new community for 30,000 residents. Forest City has worked closely with the Denver public school system and the Stapleton Foundation to design eight new schools and to actively promote diversity as one of the reasons to move to the community. Two new schools—the Denver School of Science and Technology and Denver School of the Arts—are now located in Stapleton.

Architects and facility planners should increasingly be asked to address the issue of health in myriad ways. The growing crisis of obesity among children is now on America’s education agenda, along with the growing population of children with asthma and allergies. School districts that expand their vision to include senior citizens will need to provide recreational opportunities for them as well.

These health concerns are not insignificant. There are literally hundreds of community-based groups led by concerned parents now focusing on the environmental quality of the learning environment in their children’s schools. There is also evidence that the condition of our public schools is increasingly seen as a factor in the high turnover rate of teachers. These growing health concerns may bleed into and frame the work now being done in integrating environmentally sensitive design—everything from the need for more natural daylight to high-performance mechanical systems.

As we look to the future, we can see the outline of a variety of ways to think about the iconic image of the American schoolhouse in the 21st century. Schools in urban school districts, for example, may become smaller and more specialized and focused on a certain subset of children—those interested in the arts, technology, or health services or dropouts trying to come back into the system. Other schools in these districts may define themselves as community learning centers that provide a wide array of wrap-around and support services for the children and families in their school zones. Suburban school districts, for their part, may seek to redefine themselves as the village green of the 21st century—the public meeting place and community learning center that provides a rich array of educational, recreational, and artistic opportunities for people of all ages.

Regardless of where the school is located—in a tough urban district, a rural setting, or a growing suburban community—the American schoolhouse in the 21st century will have to evolve to meet the challenges and aspirations of future generations. Schools need to provide an ample amount of public space for multiple uses so that community members may continue to engage as active and participating citizens in the ongoing work of education and democracy.

Photo: David Hathcox



>> Gary Slutzky, Educational Facilities Planner for the Syracuse, N.Y. City School District, makes a point during the National Summit.

Executive Summary

The National Summit on School Design, convened by the American Architectural Foundation and KnowledgeWorks Foundation, brought together more than 200 participants from around the country in Washington, D.C., on October 6–8, 2005. Participants represented the full spectrum of school design and education stakeholders: teachers, parents, students, school administrators, education experts, architects, community groups, mayors, and other elected officials. A number of national education and design thought leaders and industry representatives shared information on current trends related to school design.

Preparing for the National Summit

In the months leading up to the Summit, AAF conducted interviews, focus groups, and forums with education and school design stakeholders across the country. These conversations set the groundwork for the Summit. In addition, AAF reviewed and summarized the work of previous sets of school design principles developed through the work of various conferences, reports, and organizations. A detailed description of the school design principles is provided in the appendix to this report.

The National Summit was not a convention or symposium, but an event to reenergize a national dialogue on school design, where participants were actively engaged in discussions about school design principles for the 21st century and the challenges and tensions related to effective design. Scenario workshops, planned and facilitated by Harris Steinberg of PennPraxis, Harris Sokoloff of PennGSE from the University of Pennsylvania, and Chris Satullo from the Philadelphia Inquirer, allowed participants to grapple with school design issues through the lens of hypothetical community scenarios that were emblematic of real-world places with real-world problems. These scenario workshops, each containing approximately 20 participants, were then reorganized into cross-scenario issue analysis groups to address specific issues and to provide recommendations and possible solutions. Participants shared their knowledge on such important issues as trends in learning, school size, siting and location, technology, financing, traditional versus alternative spaces, public process, and community relations.

Eight Recommendations for School Design Excellence

This report details eight overall recommendations made by Summit participants following discussions on a range of school design topics. Overall, participants felt school design should create a welcoming and nurturing environment for learning. Schools are a visible and daily symbol to students and teachers of the community's commitment to education. Schools that are poorly designed or poorly maintained provide an undesirable environment for learning and achievement. Below is a summary of the eight recommendations that should shape school design in the future. The findings include considerations important at the classroom, school, and community levels.

1. Design Schools to Support a Variety of Learning Styles

A clear theme of the Summit was the importance of designing schools to enhance learning. Research has shown that not all students learn the same way. Some students excel in project-based learning, in which small groups work together to tackle problems. Some students respond well to peer tutoring, and others learn best through individual study. In designing schools, we must reexamine the notion of the traditional classroom setting and focus on a new learning environment that is designed to support student achievement. Doing so requires greater flexibility in design to accommodate a range of learning scenarios inside and outside the school.

2. Enhance Learning by Integrating Technology

Technology is no longer simply hardware and software but must be integrated into the environment of any well-designed school. Technology both supports learning and helps schools operate more effectively. In addition, access to technology has become an important tool in helping equalize learning opportunities across the student population and community. Summit participants reminded school leaders that, as they make technology choices, they should involve students in the process. As we have all learned, students today are often far more technology savvy than adults. How students respond to technology should shape how they will use it in their classroom and learning settings away from school. Summit participants cautioned that too often technology is outdated by the time it is installed in a new school and that educators need more training on how best to use technology tools. Besides the use of technology tools in classrooms, school administrators reminded us that technology advances also allow schools to better control heating, cooling, air flow, and noise and to improve communications inside the school and with parents.

3. Foster a “Small School” Culture

Summit participants agreed that school size needs to be determined within the framework of a community’s needs and vision, academic goals, traditions, and economics. Nonetheless, they recognized the importance and benefits of developing a “small school” culture that fosters relationships and attachments. Participants felt more study is required to determine how these schools perform and how school size affects operating costs and curriculum options. Although there is evidence of a movement toward smaller schools, Summit participants shared that in many districts political pressure, driven by growing enrollments, results in the building of larger schools. School size issues are still a leading area of conflict in the national discussion on education and school design.

4. Support Neighborhood Schools

Participants felt it was important to seek strategies to preserve neighborhood schools whenever possible. Neighborhood schools allow many students to walk to school, thereby supporting healthy lifestyles; smaller schools reinforce student achievement; and strong neighborhood schools bolster property values for homeowners in the area surrounding the school. Preserving neighborhood schools provides the basis for nurturing the link between the school and the larger community. Summit participants noted that decisions on whether to renovate or build new schools and where to locate schools are difficult and should be made with the full input of the community. It was agreed that, often, public opinion will initially consider building a new school as preferable to preserving an existing facility. Often educators mistakenly believe that contemporary teaching and learning methods cannot be carried out in an older facility. In many states, regulations restrict the ability of school districts to renovate older schools or build on smaller sites.

5. Create Schools as Centers of Community

Successful schools often are ones with great support and involvement from the community and ones that are often open to the community as well. Summit participants discussed the benefits of developing partnerships with local cultural organizations such as museums and libraries, universities, and businesses to expand educational opportunities for students and more deeply engage the community in the school. In some examples, schools are sharing public libraries or recreation facilities and using museums as a place for greater learning opportunities. A number of school districts have built schools to serve as the center of the community, so that facilities are used not only as a school but also as a place to house other community services such as recreational centers, resource centers, and performing arts spaces. In those situations, the school becomes a central resource for the entire community, garnering greater support and playing an important role in the community’s health. Participants expressed the importance of policies and design considerations to ensure student safety and security in these examples. In addition, participants felt school districts need more information about how to

structure and administer partnerships to maximize the benefit to their schools and communities. They cautioned that partnerships can sometimes come with strings attached that may not be in the best interest of schools.

6. Engage the Public in the Planning Process

Summit participants agreed that there is a need to improve communications and engagement with and between the school community and the community at large. There is often a “language gap” when educators and designers talk about schools with parents and community residents. An open, two-way flow of information and feedback between the school and the community it serves benefits both groups. When a school district wants to embark on design and construction of new or renovated schools, an open public process is essential. A great deal of planning and time is required for a school district and a community planning this process. Participants recommended that the public process start early, allowing for community input long before final decisions are made. The public process needs to include all school and community stakeholders, recognizing minority opinions. The use of a professional facilitator can bring objectivity to the process and help gain a consensus. It is helpful to start with a visioning process that allows all stakeholders to provide input about the role of the school in educating students and serving the community. It is important to allow students to participate in the discussion process as well. The input from these visioning meetings should shape how the facilities are designed and supported.

7. Make Healthy, Comfortable, and Flexible Learning Spaces

Summit participants heartily agreed that our nation’s schools must become committed to improving the quality, attractiveness, and health of the learning spaces and communal spaces in our schools. Over the past several decades, research and experience have demonstrated the significance of spatial configurations, color, daylighting, ventilation, acoustics, and other design elements on student achievement. Far from luxuries, these design decisions affect children’s ability to focus, process information, and learn. Beyond student achievement, such aspects of the built environment can also have significant health consequences for teachers, students, and others who work in the building. In addition, a well-designed, well-maintained school sends a vital message about the perceived worth of the building and its occupants to the community.

8. Consider Non-Traditional Options for School Facilities and Classrooms

Today, there are many ways in which a school may function, and many places where it may be housed. Often, these new types of school spaces and locations contribute to student learning by offering non-traditional opportunities to engage with academic subjects and the environment outside the classroom. Summit participants encouraged school districts and communities to explore options for employing underused civic, retail, and other adaptable nonschool spaces. Many cities have community assets such as museums, colleges, research labs, and other institutions that offer the potential for experiential learning. Participants felt that education needs to be connected to real-life applications and experiences, particularly at the high school level. Although moving away from traditional models will require much community discussion and engagement, there was a consensus that this dialogue can often lead to highly favorable results and important learning opportunities for students.

Next Steps: Advancing the National Agenda

Based on the recommendations of National Summit participants, AAF, KnowledgeWorks and other partners in the *Great Schools by Design* program are committed to advancing the work started by the National Summit on School Design and contributing to new knowledge and new strategies for the design and construction of schools nationwide. National and international thought leaders, researchers, and stakeholders will gather for a series of forums over the next two years to examine a range of topics in each of two broad areas derived from the Summit:

Design for Learning

- Student Achievement
- Classrooms for the Future
- School Size
- Technology and the Learning Environment

Schools for Better Communities

- Site Size and Location
- Safety and Security
- Community Engagement
- Partnerships
- School Financing
- Sustainable Design

Recognizing School Design Excellence

Through videos, publications and awards AAF and KnowledgeWorks will highlight successful schools that foster student achievement and serve as centers of community. Below are some examples of our potential work in this area:

- **Video Series**—AAF and KnowledgeWorks will produce documentary videos that profile school design excellence and highlight best practices.
- **Publications**—White papers, articles, reports on School Design Institutes, newsletters, and publications help school and community leaders become more informed about education and school issues.
- **Awards Program**—In 2007, AAF will introduce the *Great Schools by Design* awards program to recognize schools where design has helped contribute to academic excellence.

Transforming State and Federal Policies

State and local governments have a powerful and ongoing role in financing school construction and defining the rules and regulations that define siting, size, environmental sustainability, and other areas. These policies can either enhance or detract from innovative possibilities for school design, smart growth, and partnerships. AAF and its partners will bring experts together to develop creative models and policy recommendations to guide state legislatures and policymakers, with a particular focus on ensuring greater flexibility regarding site and size determinants. The federal role in school design, although limited, will be considered with a particular emphasis on how the federal tax code can be used to encourage and finance creative school and community partnerships.

About *Great Schools by Design*

Great Schools by Design is a national AAF initiative that seeks to improve the quality of America's schools and the communities they serve by promoting collaboration, excellence, and innovation in school design. Throughout the country, *Great Schools by Design* engages superintendents, architects, teachers, parents, residents, students, local government officials, and other stakeholders in a far-reaching conversation about what must be done to improve the places where children and young adults learn. We strive to help create schools that both support student achievement and serve as centers of community.

Photo: David Hathcox



>> Jason Cowell with Cisco Systems and Dr. Rebecca Borden with the Arts Education Partnership participate in a breakout session.

Each day across the United States, more than 59 million students, teachers, and education employees spend considerable time in our nation's 120,000 school buildings. Unfortunately, too many of these schools are aging, crowded, and in need of repair. These pervasive conditions negatively impact our children's ability to learn and our teachers' ability to teach. With school enrollment forecasted to increase at record levels through 2013, and spending on school construction, renovation, and maintenance expected to total nearly \$30 billion annually, the need to transform our schools has never been more urgent.

AAF brings a variety of school design stakeholders together through such events as the National Summit on School Design, forums on particular topics, and School Design Institutes that help school districts and decision makers consider innovative options for school design. In addition, AAF works with its partner KnowledgeWorks Foundation to produce a video library of best practices in school design. The first award-winning video, *Schools as Centers of Community: John A. Johnson Elementary School*, has received national exposure and will be followed by a video titled *Schools Designed for Learning: The Denver School of Science and Technology*.

About the National Summit on School Design

Over the past 15 to 20 years in the United States, a number of national and local organizations have worked to broaden our understanding of the relationship between learning and school design. Many conferences have been held, with reports and studies providing the latest research on learning, teaching, organizations, materials, and the design of schools.

In 2004, AAF entered this important national conversation and began to gather additional insights regarding current challenges and best practices in school design. After creating *Great Schools by Design*, AAF conducted interviews, focus groups, and forums with school design stakeholders across the country. With this input in mind, the National Summit on School



Photo: David Hathcox

>> Superintendent Sylvester Small of Akron, Ohio and Jim LaPosta, AIA with Jeter Cook & Jepson Architects confer on the challenges in a school design scenario.

Design was conceived to help reenergize a national dialogue involving a broad circle of stakeholders about important trends, best practices, and practical knowledge in education and school design.

The National Summit was convened by AAF and KnowledgeWorks Foundation. Additional sponsors for the National Summit on School Design included Herman Miller, Inc., McGraw-Hill Construction, Cisco Systems, Inc., and the American Institute of Architects. Held just outside of Washington, D.C., at the University of Maryland in College Park, Maryland, on October 6–8, 2005, the Summit brought together 200 invited participants from around the country. The event was designed to represent diverse voices involved in education and school design. AAF and KnowledgeWorks Foundation assembled this diverse national group to share knowledge and experiences, hear new and dissenting points of view, and ultimately arrive at some meaningful consensus about how schools of the future should look, function, and support student learning and their communities.

To assure broad representation of all key stakeholders, AAF and KnowledgeWorks Foundation provided full or partial scholarships to underwrite travel costs, meal, and hotel costs for over one-half of Summit participants. This policy guaranteed participation from students, classroom teachers, principals, and others who did not qualify for support from their institution.

In addition, representatives from AAF's *Great Schools by Design* alliance partners participated in the National Summit. These organizations continue to engage with AAF in an ongoing effort to educate the public about the importance of design excellence in school facilities. They included the American Association of School Administrators, the American Federation of Teachers, the Council of the Great City Schools, the National Association of Elementary School Principals, the National Association of Secondary School Principals, the National Clearinghouse for Educational Facilities, the National Education Association, the National School Boards Association, the Committee on Architecture for Education from the American Institute of Architects, and the U.S. Conference of Mayors.



Photo: David Hathcox

>> Professor Roy Strickland from the University of Michigan discusses his "City of Learning" concept with Summit participants.



Photo: David Hathcox

>> A student from the Charter High School for Architecture and Design in Philadelphia speaks out during the opening session of the National Summit.

The National Summit actively engaged participants in a dialogue about challenges and tensions related to effective school design. Scenario workshops were designed and facilitated by PennPraxis and PennGSE from the University of Pennsylvania and Chris Satullo from the Philadelphia Inquirer. These sessions engaged the participants in constructive debate without tying them to the particular politics of an actual community. Participants were asked to grapple with school design issues through the lens of hypothetical community scenarios representative of real-world places with real-world problems. The scenario workshops, each involving approximately 20 participants, then broke out into smaller groups to address specific issues and provide recommendations and possible solutions. The personal interaction between participants of different backgrounds led to unanticipated outcomes and innovative solutions—the types of conversations that help change opinions and build awareness of divergent points of view.

When participants were not debating the necessity of creating smaller schools or pondering the best way to create schools that are better integrated with the environment and community, they heard from national thought leaders who challenged their assumptions and confronted status quo solutions. These speakers included Russell Ackoff, Ph.D., noted author and professor emeritus of the Wharton School of Business at the University of Pennsylvania, who explained in the keynote speech the dangers of “Doing the Wrong Thing Right.” As Dr. Ackoff said in his address, “Schools ought to be about learning, not teaching. Far too often, society trains people to give an answer that is expected, stifling creativity.”

Another panel, “Trends Affecting the Future of School Design,” featured education and school thought leaders: Elliot Washor, Ph.D., co-founder of The Big Picture Company; Roy Pea, Ph.D., director of the Stanford Center for Innovations in Learning; David Sciarra, executive director of the Education Law Center; and Roy Strickland, professor, Urban Design Program at the University of Michigan. The panel, moderated by Michele Norris of National Public Radio, gave participants a sense of the opportunities for schools of the future. An industry panel, moderated by Robert Ivy, Editor in Chief of Architectural Record, explored how advances in technology, furnishings, ventilation, and other areas can positively affect learning. Thought leaders on this panel were Richard Lord, engineering manager, Carrier Corporation; Jason Cowell, education marketing solutions manager, Cisco Systems Inc.; Ken Roy, Ph.D., senior principal research scientist, Armstrong World Industries; Wally Corwin, corporate manager, Product Integrity, JELD-WEN, Inc.; and Anne Taylor, Ph.D., design consultant for Herman Miller, Inc. and professor at the University of New Mexico.

At the conclusion of the Summit, PennPraxis and PennGSE reported on preliminary findings from the workshops and other participant breakout sessions. Their synopsis highlighted areas of broad consensus, tension, tradeoff, and opportunity surrounding a series of school design principles. Broad consensus was found on certain concepts, such as creating community-based learning models, equity in the distribution of resources, and community involvement in the design process. Other ideas remained more controversial or required further research, such as closing urban schools to develop new facilities on suburban sites and security issues involved with multiuse facilities. This report provides details and additional information on these findings.



Photo: David Hathcox

>> Participants at the National Summit gather to discuss and evaluate principles for effective school design.

National Summit on School Design Participants

The National Summit on School Design brought together diverse voices and perspectives from across the country. The findings in this report reflect the thoughtful conversations and suggestions made by participants. The American Architectural Foundation and KnowledgeWorks Foundation thank the following participants for their time and ideas.



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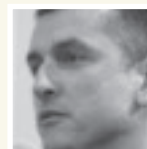
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8 Eight Summit Recommendations for School Design Excellence in the 21st Century

Designing schools for educational excellence requires thoughtful attention to a range of issues. At the *National Summit on School Design*, participants met in groups to capture knowledge and share it across disciplines through a process of deliberative dialogue. This section of the report provides participants' collective thoughts and recommendations on the following eight issues:

1. Design Schools to Support a Variety of Learning Styles
2. Enhance Learning by Integrating Technology
3. Foster a “Small School” Culture
4. Support Neighborhood Schools
5. Create Schools as Centers of Community
6. Engage the Public in the Planning Process
7. Make Healthy, Comfortable, and Flexible Learning Spaces
8. Consider Non-Traditional Options for School Facilities and Classrooms

For each of these issues, participants established areas of agreement, noted challenges and tradeoffs, and provided best practices and real-world examples. Highlights from those findings are provided in the following pages. Each section concludes with a bibliography of resource materials for additional information on the issue.

1

Design Schools to Support a Variety of Learning Styles

“Schools ought to be about learning, not teaching.”

Russell Ackoff, Ph.D.
Author and Professor Emeritus
Wharton School of Business
Keynote Speaker at the National Summit on School Design



Russell Ackoff, the keynote speaker at the National Summit on School Design, challenged participants to think about how students learn rather than teaching students to give an answer that is expected—a process he says stifles creativity. Increasingly, educators are moving beyond the traditional pedagogical models to incorporate more experiential settings to engage students in new ways of learning. A clear theme of the Summit was the importance of designing schools to enhance learning. Research has shown that not all students learn the same way. Students are responding well to project-based learning that is hands-on and collaborative. In project-based learning, students work in teams to solve problems and complete assignments.

In designing schools, we must reexamine the notion of the traditional classroom setting and focus on new learning environments that are designed to support student achievement. Doing so requires greater flexibility in design to accommodate a range of learning scenarios inside and outside the school.

Participants encouraged school design that reflects research on learning to create environments that are student centered and driven by the students’ interests. These environments allow for small group discussions and work projects, individual workstations, and distance learning, as well as traditional classroom settings. Technology plays an important part in the design of these environments. Teachers will have greater flexibility in determining the best approaches to foster individualized learning plans for students in their classrooms.

Learning should not be limited to the classroom. Participants shared examples of how schools and teachers have established collaborative partnerships with community institutions such as businesses, museums, universities, and churches to enhance learning and mentoring opportunities for students of all ages. Many high schools are requiring some community service learning as part of their programs.



“We have a unique opportunity and obligation to rethink the classic American schoolhouse and envision new school designs that enhance learning and community for the 21st century.”

Ronald E. Bogle
President and CEO
American Architectural Foundation



>> At the MATCH School in Boston, an innovative approach to learning that focuses on mentoring and personal student attention helps improve student achievement.

Strategies for Education Reform



Prakash Nair

Principal of Fielding/Nair International
 Managing Editor of DesignShare.com
 Participant in the National Summit on School Design

- **Personalization of learning.** A good educational model will “personalize” each student’s learning experience.
- **Mutli-age classes.** It makes sense to group students in ways that offer them the best opportunity to get a rich learning experience and not on the basis of their age.
- **Multi-disciplinary curricula with block scheduling.** Block scheduling is an alternative way to break up the school day into larger time segments that permit students more time on a given subject.
- **Project-based learning.** Instead of learning material out of textbooks, students work in teams to tackle real-world problems.
- **Cooperative learning.** A system where students become both motivated and motivators, empowering students to succeed on their own terms.
- **Peer Tutoring.** Students become better learners as they take on the role of teachers and mentors to younger children.
- **Internships.** Fosters “school-to-career” focus that helps make curriculum more relevant to the student.

Excerpted from “30 Strategies for Education Reform” by Prakash Nair

Trends in Learning Examples

School District Embraces “Interactive Classroom of the Future”

In Minnesota, the Minnetonka School District has embraced technology as a crucial element of good school design and learning. After an educational campaign in the local community to demonstrate the importance of technology in the classroom, called the “Interactive Classroom of the Future,” voters passed a \$30 million technology levy that has allowed schools in the district to go high-tech. Classrooms include wireless technology or carts that allow access to the Internet, interactive whiteboards, and projection equipment that is tied to computers and other learning apparatuses, such as microscopes. Teachers report that technology in the classrooms has improved student achievement and has improved their teaching as well.

Students at Wyoming School Campus Learn on the Range

Courtesy of Mithun



>> *Teton Science Schools, Jackson, Wyo.*

An excellent example of ecologically sensitive school development in a non-urban setting is the independent Teton Science Schools in Jackson, Wyoming. The 880-acre campus is filled with creeks, ponds, stands of trees, and other habitats. All these natural features have become an integral part of the curriculum and have created an outdoor classroom for field science work.

The school built nine buildings, concentrating them on 16.5 acres, a small portion of the overall site. Buildings are tightly grouped to encourage community and reduce their impact on the land, to preserve natural habitat, and to protect scenic resources. The school’s buildings also use “environmentally intelligent” features such as radiant heating in concrete floor slabs and natural ventilation and solar gain to decrease heating and cooling loads.

Los Angeles Science School Creates a Variety of Learning Spaces

Photo: Lisa Peardon, California Science Center



>> *California Science Center School*

In south central Los Angeles, a partnership between the California Science Center and the Los Angeles Unified School District led to the creation of the Science Center School. It serves both as a neighborhood elementary school with a math and science curriculum and as a resource center for educators and the community. All the spaces in these buildings create a place where kids and adults can become excited by learning about science. Classrooms are complemented by common rooms for group experiments, and the resources of the California Science Center are made an integral aspect of the curriculum and learning model.

In addition, many different spaces that connect students to the outdoors for learning have been incorporated into the school. The school occupies a building designed by the renowned architectural firm Morphosis, as well as a renovated

Trends in Learning: Challenges and Tradeoffs

Incorporating new learning models into schools requires more professional development to help teachers acquire the necessary knowledge and skills.

Concerns exist about whether these practices will enable students to meet state and federal No Child Left Behind standards.

Lack of experience in establishing community-based collaborative partnerships can be an obstacle.

School communities need to develop a greater understanding and support for newer learning models.

1912 armory nearby. The armory houses a kindergarten and the Amgen Center for Science Learning. The school has become a source of pride in a neighborhood traditionally known for its overcrowded schools and low academic achievement.

Boston Charter High School “Matches” Students with Mentors

The Media and Technology Charter High School (MATCH) in Boston provides a unique and innovative approach to education. Housed in a former auto dealership that has been renovated and converted to school uses, the 184 students at MATCH participate in an academic system that focuses on tutoring and mentoring as the key to student achievement. The success of this approach has been well documented by the school, particularly with at-risk student populations.

Students go into the community for many services traditionally supplied by schools. For example, there is no cafeteria on site; instead, students eat in local restaurants. What makes the school even more unusual is that it has taken its focus on mentoring students to an entirely new level. The third floor of the school, originally intended to be leased to generate income, has instead been converted into housing for full-time student mentors and tutors. The school offers paid internships to recent college graduates from top universities, ages 22 to 26, who would like to spend nine months tutoring urban youth. They are paid a small living stipend and given free housing at the school.

The results of MATCH’s approach to education have been impressive. In 2005, the school had the highest overall pass rate on standardized testing of any Boston high school—89 percent of the 2005 class passed the English and Math MCAS (Massachusetts Comprehensive Assessment System). This pass rate is 37 percent higher than the average in Boston. It is also interesting to note that 73 percent of MATCH students come from middle- to low-income families that qualify for free or reduced school lunches.



Courtesy: MATCH School

>> *Students at the MATCH School work with mentors in small groups that support individual learning styles.*

Resources

30 Strategies for Education Reform

<http://fieldingnair.com/30strategies.pdf>

Prakash Nair, Fielding/Nair International, 2003

This booklet synthesizes key learning theories and current practices into 30 strategies for reforming educational programs and the facilities that accommodate them. These strategies include interactive “learning studios” and “learning streets,” instead of classrooms and halls; project rooms that can accommodate various specialties simultaneously; less “scheduled” use of resource and common areas; multiage grouping; and areas for parent, community, teacher, and solitary student use.

Innovative Pedagogy and School Facilities

<http://www.designshare.com/Research/Washor/InnovativePedagogyAndFacilities.asp>

Elliot Washor, *DesignShare*, 2003

This research examines the translation of innovative and complex school reform models, based on non-traditional pedagogy, into school facilities design. Factors facilitating and impeding the process are identified, as are the relationships between the numerous constituencies. The study analyzes the three major forces determined to be at work in the process, which were (1) political, (2) social, and (3) economic. The school examined is the Metropolitan Regional Career and Technical Center in Providence, Rhode Island.

In Sync: Environmental Behavior Research and the Design of Learning Spaces

http://www.scup.org/pubs/books/is_ebrdls.html

Lennie Scott-Webber, Society for College and University Planning, 2004

This book analyzes research relating to the effect of the environment on behavior. It establishes five archetypal environments that support learning in the current knowledge age, versus the prevalent but outdated agrarian- and industrial-age models: (1) environments for delivering knowledge, (2) environments for applying knowledge, (3) environments for creating knowledge, (4) environments for communicating knowledge, and 5) environments for making decisions.

New Designs for Learning: K-12 Schools

<http://vocserve.berkeley.edu/CenterPoint/CP6/CP6.html>

George H. Copa, University of California, National Center for Research in Vocational Education, 1999

Project staff found that designing schools for the future is a learning process in which staff members, students, community members, and designers work together to discover new ways to design a school's learning experiences and environment. Goals included (1) representing the leading edge of a new breed of schools that would create some new space in which to think about the operation of high schools; (2) promising the idea of a common set of learner outcomes for all graduates; (3) relating learner expectations to the challenges and opportunities in work, family, community, and personal life; (4) operating the high school more as a learning community; (5) more closely aligning the learner's expectations, the learning process, the learning organization, and the learning environment; (6) drawing more attention to learning in contrast to teaching; (7) having a positive special character that gives more focus, coherence, and spirit to learning; and (8) wanting schools that don't cost any more to build or operate than existing schools. The design-down process has 12 learning elements: context, audience, signature, expectations, process, organization, partnerships, staff and staff development, environment, celebration, finance, and accountability.

Practice Theory, Pedagogy, and the Design of Learning Environments

http://www.aia.org/cae_a_20031101_justathought

Peter C. Lippman, *CAE Net*, July 2002

This article focuses on what might be achieved for school design in the 21st century. Practice theory is examined for an understanding of how individuals become engaged within their environments. Pedagogy is explored in relation to practice theory as a means for understanding how activities are organized to facilitate learning. From these perspectives on how learning occurs within these activity settings, an approach for design is produced.

Schools That Fit

<http://www.cunningham.com/schoolsthatfit/index.html>

Cunningham Group, 2003

This book is one architectural firm's concise description of understanding and applying the latest educational research in a real-world setting. It looks at planning from a “lessons learned” perspective through the following chapters: (1) Schools That Fit; (2) Toward Better Schools; (3) Schools That Fit Communities; (4) Schools That Fit Education Leaders; (5) Schools That Fit Teachers; (6) Schools That Fit Learners; (7) Schools That Fit Children; and (8) Schools That Fit the World.

Ten Educational Trends Shaping School Planning and Design

<http://www.edfacilities.org/pubs/trends.pdf>

Kenneth R. Stevenson, National Clearinghouse for Educational Facilities, 2002

This publication examines 10 educational trends that should be considered in the planning, design, and modernization of schools: (1) the lines of prescribed attendance areas will blur, (2) schools will be smaller and more neighborhood oriented, (3) there will be fewer students per class, (4) technology will dominate instructional delivery, (5) the typical spaces thought to constitute a school may change, (6) students and teachers will be organized differently, (7) students will spend more time in school, (8) instructional materials will evolve, (9) grade configurations will change, and (10) schools will disappear by the end of the 21st century (or will they?).

The Future of School Facilities: Getting Ahead of the Curve

http://www.crpe.org/pubs/pdf/report_facilitiesweb.pdf

Michael DeArmond, Sara Taggart, and Paul Hill, Center on Reinventing Public Education, University of Washington, 2002

This paper asserts that instead of assuming that the future of learning has to take place in buildings we happen to have now, districts can let innovations in instruction and learning drive how they provide, design, and use school buildings. With this goal in mind, the authors look at five trends in education and what they imply about the kinds of buildings and spaces districts will need for tomorrow's schools. Suggested strategies include developing smaller schools, sharing buildings between multiple schools, adapting facilities for both commercial and educational uses, and developing partnerships with companies and organizations outside the education sector.

The Next Wave

<http://www.peterli.com/archive/spm/937.shtm>

Steven Bingler, School Planning and Management, July 2005

This article envisions future learning environments that are designed in response to recent advances in educational thought and practice, which are in turn a response to emerging theories of brain activity and connectivity.

The School of Tomorrow

<http://www.asbj.com/lbd/2005/inprint-school-of-tomorrow.html>

James McDonough, Learning by Design, 2005

This essay describes critical changes in education that will inform school design between now and 2030, including smaller and more portable teaching technology, green design, and aesthetics that reflect community values.

2

Enhance Learning by Integrating Technology

Students entering today's high schools are often more technology savvy than the teachers and adults working in the schools. As school leaders make technology choices, Summit participants remind them to involve students in the process. How students respond to technology should shape how they will use it in their classroom and learning settings away from school.

Summit participants cautioned that too often technology is outdated by the time it is installed and that educators need more training on how best to use the technology tools. Educators and school designers can learn much about designing the schools of the future by observing how students interact and respond to technology in their everyday lives.

Summit participants agreed that computer technology must be integrated into the school and curriculum, not just added on as hardware and software. From the moment the school design process starts, technology and its role in enhancing learning must be part of the discussion. Computers, wireless Internet access, videoconferencing, interactive whiteboards, and a range of other technology tools offer the potential to transform learning; school-teacher-parent communication; and even the basic functioning of the school building's security, heating and cooling systems, and lighting.

Technology in schools offers important benefits to help bridge the equity gap for students who do not have access to technology away from the school. Technology can also help give children with disabilities greater learning opportunities. In addition to supporting learning, new technologies enhance communication between teachers, students, and parents—for example, many schools operate their own websites where students and parents can review homework assignments, grades, extracurricular schedules, and other important information.

Technology is also playing an increasing role in helping school districts operate their facilities more efficiently. Summit participants report that computers in a central office can monitor air and heat flow, track energy use, and manage a range of safety and security operations. However, classroom teachers and principals also want the option to adjust temperature as needed in their classrooms and schools.



>> *Students at the Denver School of Science and Technology work on laptops in the school's wireless environment.*

Photo: Trudy Hutcherson

Technology Examples

“High-Tech High” Becomes a National Model

The concept of a “high-tech high,” or high school focused on the sciences, technology, and math, was most visibly conceived in San Diego, California, in 1998. The concept has since expanded to other schools around the country. There are now schools modeled on High-Tech High in Los Angeles and Denver. In addition, the original High-Tech High has opened high-tech and media-focused middle schools in San Diego. All of these schools focus on maintaining smaller student populations, creating community, and using technology to enhance the learning process. They feature totally

wireless environments, where students use laptops to research, take notes, and collaborate with each other by email. In most cases, the architecture of these schools has been created to showcase the ways in which technology shapes both the school and the school’s curriculum: technology is exposed and classrooms may be reconfigured to accommodate a variety of learning formats. (AAF and KnowledgeWorks are currently producing a video case study about the Denver School of Science and Technology.)



>> *The Denver School of Science and Technology*

Photo: Trudy Hutcherson

Technology: Challenges and Tradeoffs

Too many people view technology as an add-on or mere equipment, leading to a lack of systemic procurement of technology.

The pace of technology development often outstrips the usual decision cycle of school districts.

Teachers often lack training or are resistant to using technology.

Adoption of technology requires rethinking traditional classroom and furniture design.

Excessive enthusiasm for technology could downgrade proper roles of teachers and guides.

Philadelphia Creates “School of the Future”

The School District of Philadelphia and Microsoft Corporation have partnered to create the “School of the Future” in West Philadelphia. This state-of-the-art high school will incorporate the latest technology and focus on using this technology to enhance academic achievement and help in students’ career development. The school will accommodate between 700 and 800 students, a size that is intended to give a greater sense of community and to foster accountability. The school is scheduled to open in September 2006.

1970s Tech Has a Makeover in Michigan

Other examples of technology influencing the design of a school include the renovation of existing

buildings for high-tech functions. In 2000, local school officials renovated West Bloomfield High School in Michigan with a new focus: technology. The original school, built in 1971, had a U-shaped plan with a traditional library in the center. The renovation altered this space to become a high-tech media center featuring the latest technology. Students are able to use computers and other high-tech equipment to enhance their education and research. The media center is surrounded by auxiliary spaces that are equally well suited for working with technology, such as a television studio, a radio station, and a distance learning studio. School officials report that many students are interested in attending thanks to the media center and its learning tools.



>> *A student works in the technology laboratory at West Bloomfield High School, West Bloomfield, Mich.*

Courtesy of West Bloomfield High School

Six Technology Trends for Future Schools



Roy Pea, Ph.D.

Director, Stanford Center for Innovations in Learning
Stanford University
Presenter at the National Summit on School Design

1. Pervasive, portable personal computing

The convergence of easy, inexpensive, fast Internet access and ever-smaller and powerful wireless computing devices will allow students more options for learning and accessing information. In the digital classrooms of the future, students will have their own small computing device such as a pocket personal computer or sublaptop that they can use for accessing information from the Internet or completing interactive coursework in the classroom or at home.

2. Distributed learning: solo and learning teams

Videoconferencing, collaboration software, and multimedia learning resources will enable distance learning applications for individual students or learning teams. Students can collaborate with knowledge experts at colleges, museums, and research institutions or with business mentors. Smaller or rural schools can offer greater curriculum options through partnerships with other schools and learning centers.

3. Lifelong digital learning portfolios

The ability to store vast amounts of information on a small portable device will allow students and adults to create their own digital learning portfolio. The portfolio will provide easy management of all information media developed by the learner over a lifetime, in a manner that is usefully indexed for reflective learning and certification purposes. This device will be ideal for helping teachers learn what transient K-12 students know when the students enter new schools.

4. Support for learning conversations

School buildings will be equipped with wall-sized interactive computing displays that teachers and students can draw and write on for integrating or applying knowledge. These interactive whiteboards will help make thinking visible for learning and assessment.

5. Flexible buildings that learn from users

Learning spaces can be easily reconfigured to support users in the way they learn. Classrooms can be adapted for small group discussions, videoconference presentations, traditional lecture settings, or interactive multimedia activities.

6. Enhancing place-based learning

Geo-sensing coupled with mapping and multimedia documentation can support local learning communities with the learn-anytime-anywhere features of pervasive computing. Communities can index and capture local learning resources with photos, videos, even voices, which can be shared on demand instead of from schools. Google Maps, which allows a user to view a specific location from a satellite photo, is a good example.

Adapted from Roy Pea's presentation at the National Summit on School Design.

Resources

A Solid Foundation

http://asumag.com/mag/university_solid_foundation/

Alan Bjornsen, *American School and University*, March 2004

This article describes a variety of local, wide area, and personal wiring options that should be considered when planning a new or renovated facility. Adequate space for services and cabling, as well as flexibility to accommodate future technology is emphasized.

Hot Technologies for K-12 Schools

http://www.cosn.org/resources/emerging_technologies/hot.cfm

Consortium for School Networking, 2005

This report identifies the “must have” technologies most likely to transform schools through innovation, including active highly portable large storage devices, data casting, digital assessments, intelligent essay graders, intelligent pattern analysis performance projections, sound-field amplification, multisensory customized learning tools, programmable phone systems, student information systems, learning management systems, blogs, and radio frequency identification data.

Schools Designed for Learning: The Denver School of Science and Technology

<http://www.archfoundation.org/aaf/gsbd/> (available summer 2006)

American Architectural Foundation and KnowledgeWorks Foundation, 2006

This video and accompanying resource guide tell the story of an innovative, small high school in Denver, Colorado, that uses technology and design to enhance the education of students. Non-traditional groupings of space and dynamic uses for technology in the classroom are explored in the video, and further information and resources are provided in the resource guide. This video is part of the American Architectural Foundation’s *Great Schools by Design* resource library on best practices in school design, intended to help foster conversation and new thinking in communities across the country.

Tech Talk: Are You In or Out?

http://asumag.com/mag/university_article_2/index.html

William C. Day, *American School and University*, June 2004

A whole new family of productivity-enhancing tools will make it easier to enhance student learning in the classroom. These new tools include gigabit Ethernet networking, voice over data networks (VoIP), interactive whiteboards, mobile computer carts, and data projectors.

Technology Tools

http://asumag.com/mag/university_technology_tools/

Mike Kennedy, *American School and University*, March 2005

This article describes three technology innovations that have been particularly helpful in educational environments: Internet-enabled communications, sophisticated library materials tracking through chips placed in books, and whiteboards.

The Role of Wireless Computing Technology in the Design of Schools

<http://www.edfacilities.org/pubs/wirelessll.pdf>

Prakash Nair, National Clearinghouse for Educational Facilities, 2002

This publication discusses integrating computers logically and affordably into a school building’s infrastructure through the use of wireless technology. It provides an update on advances, developments, and concerns in seven key areas: bandwidth, interference, system design and layout, security, network administration, occupant health, and vandalism. It then addresses the effects of wireless local area networks, or WLANs, on learning and on the future of school design and discusses costs and equitable access.

3

Foster a “Small School” Culture

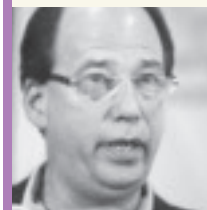
School size continues to be a topic of great debate. In many districts, growing enrollment, coupled with limited capital and operating resources, has led to consolidations of schools and schools with larger enrollments. It is not uncommon for some high schools to have as many as 4,000 or 5,000 students. For several years, there has been a growing movement to establish smaller schools as a way to improve student performance, attendance, extracurricular participation, and graduation rates. For example, in February 2006, New York City announced plans to open an additional 36 high schools and middle schools with enrollments of between 300 and 600 students. In Ohio, KnowledgeWorks Foundation has been involved in opening 55 new small high schools on the campuses of 15 large, low-performing urban campuses as part of its Ohio High School Transformation Initiative. In addition, the Bill & Melinda Gates Foundation is a major proponent of smaller schools and has contributed more than \$1 billion to help fund 1,500 smaller schools nationally.

Summit participants agreed that school size needs to be determined within the framework of a community’s needs and vision, academic goals, and economics. Nonetheless, they recognized the importance and benefits of developing a “small school” culture that fosters personal relationships and attachments, with an emphasis on class size and the size of the school population. They also expressed concern that school consolidations undermine the benefits of neighborhood schools and further separate the public from public schools.

“We should think about small schools of 130 students; and the families involved in those schools. We should begin looking at health care centers, fitness centers, performance centers—really changing the nomenclature of schools and opening them up completely to the community. We’d have no fences, no gates, and no security cameras.”

Elliot Washor, Ph.D.

Co-founder, The Big Picture Company
Presenter at the National Summit on School Design



Participants offered a variety of suggestions on how to create small school cultures. Large schools can be adapted to support smaller learning communities. A number of cities have dubbed these “schools within schools.” In larger school districts, there may be a number of school sizes based on learning objectives such as preparing students for careers and study in science, math, the arts, trade industries, and media and communications. One of the concerns with smaller schools is a limited number of curriculum resources for students. Participants felt that distance learning and the use of Internet-based curricula provide effective strategies to address those issues.

School Size Examples

Philadelphia's Plan and the Charter High School for Architecture and Design

In Philadelphia, School Superintendent Paul Vallas has embarked on a \$1.6 billion program to renovate and replace many old and crumbling school buildings. His plan calls for turning 38 large high schools into 66 small and medium-size campuses that are equipped with the latest technology tools to support learning.

School Size: Challenges and Tradeoffs

Convincing people that smaller schools are not necessarily more expensive.

Some states mandate square footage requirements that make it hard to design small schools.

Maintaining diversity while reducing school size can be a challenge.

Smaller schools may have fewer curricula and resource options.

The "school without walls" idea conflicts with some people's perceptions of what school should be and how it should work.

Also in Philadelphia, CHAD, the Charter High School for Architecture and Design, has set an example in creating a design-focused curriculum and a community that supports student achievement and success, requiring adherence to strict standards of conduct and academic achievement. Founded by the Philadelphia Chapter of the American Institute of Architects as part of its Legacy 2000 project, the school has an enrollment of 460 students and maintains a student-teacher ratio of 15:1. The school is located in downtown Philadelphia and uses the city as a classroom through special projects and interaction with professionals in the design and construction fields.



Courtesy of CHAD

>> Students at the Charter High School for Architecture and Design in Philadelphia participate in a review of student work.



>> *Little Village High School,
Chicago, Ill.*

Chicago's Focus on Smaller Schools and the Little Village High School

Chicago has taken a bold approach to reforming its schools in announcing that it will convert approximately 10 percent of its schools into small neighborhood schools, many in existing school buildings. These 100 small schools will be located throughout the city. The school district will pay for maintenance and equipment costs, and nonprofit organizations will be responsible for raising \$50 million in remaining costs. The plan, called "Renaissance 2010," was announced by Mayor Richard Daley in 2004. At that time, he stated, "We must face the reality that, for schools that have consistently underperformed, it's time to start over."

One example of creating dynamic smaller schools is the Little Village High School on Chicago's southwest side, opened in 2005. The building itself is divided into four separate school facilities. The colorful structure houses 1,800 to 2,000 students in 287,000 square feet. Each 450- to 500-student school has a separate administrative structure and principal, who reports to a master principal. The four schools share a number of spaces, such as sports facilities, a cafeteria, and an auditorium.

The Met School in Providence Is a Small School That Works

The Met School in Providence, Rhode Island, a Big Picture Company high school, maintains a student to teacher ratio of 15:1 and focuses on creating a strong community for its students, engaging families in their education, and using non-traditional methods of student evaluation. First opened in 1996, the Met School has expanded across Providence to a network of six small schools of 120 students each. It has reported that it has one-third the dropout rate, one-third the absentee rate, and one-eighteenth the suspension rate of typical public high schools in Providence. In addition, the school reports that every graduate has been accepted into college, regardless of family educational background.

Resources

Back to the Agora: Workable Solutions for Small Urban School Facilities

<http://www.ael.org/digests/edorc03-4.pdf>

Barbara Kent Lawrence, AEL, ERIC Clearinghouse on Rural Education and Small Schools, 2003

This article suggests adapting the model of the ancient Greek *agora* to create successful small schools and describes several that have done so while reducing costs. Strategies used by communities to keep schools small and local include sharing facilities with other schools, reconfiguring large high schools, sharing with an education partner, sharing with a noneducation partner, sharing with the community, leasing space in the community, using the small facility in new ways, leasing the whole facility, and capitalizing on the facility.

Dollars & Sense: The Cost-Effectiveness of Small Schools

http://www.kwfdn.org/resource_library/_resources/dollars_sense.pdf

KnowledgeWorks Foundation, 2002

This publication summarizes research on the educational and social benefits of small schools and the negative effects of large schools on students, teachers, and members of the community, as well as the diseconomies of scale inherent in large schools. It asserts that research shows that measuring the cost of education by graduates rather than by all students who go through the system suggests that small schools are a wise investment.

Dollars & Sense II: Lessons from Good, Cost-Effective Small Schools

<http://www.goodsmallschools.org/Downloads.asp>

KnowledgeWorks Foundation, 2005

This publication deepens the evidence that good small schools are more affordable and successful even when compared with larger schools in the same district. It reports analysis of data from more than 3,000 school construction projects and practical strategies for cost-effectiveness that schools have field tested.

Of Sprawl and Small Schools

<http://www.realtor.org/sg3.nsf/Pages/winter05sprawl?OpenDocument>

David Goldberg, *On Common Ground*, Winter 2005

This article describes the logistical and social consequences of building large, remote, and pedestrian-unfriendly schools; efforts to preserve neighborhood schools; and opportunities for breaking up large schools into smaller learning communities. Historical and curricular reasons for constructing large schools and some of the benefits communities realized by creating smaller neighborhood schools are also discussed.

Reducing the Negative Effects of Large Schools

<http://www.edfacilities.org/pubs/size.html>

Daniel L. Duke and Sara Trautvetter, National Clearinghouse for Educational Facilities, 2001

An overview of recent efforts to promote small schools, this paper begins by reviewing the rationale for small schools, drawing on recent studies linking school size and various outcomes. Arguments for large schools are examined next. The succeeding section looks at four ways to reduce the negative effects of school size: build smaller schools, use satellite facilities, reallocate space in existing schools, and redesign and renovate existing schools. The paper identifies a variety of ways in which large schools are being downsized.

The Great Size Debate

<http://www.cefpi.org:80/pdf/issue13.pdf>

Sue Robertson, Council of Educational Facility Planners International, 2001

This report reviews research that compares large schools with small schools in such areas as academic performance, class-size benefits, operational problems, and student social development. A list of the benefits of small school for students, families, teachers, and the institution is included.

4

Support Neighborhood Schools

The siting of school facilities has a profound effect on a community. New schools and high-achieving schools increase home values and can spur an area's economic growth and competitiveness. Summit participants recommended preserving neighborhood schools whenever feasible. Neighborhood schools provide the opportunity for students to walk and bike to school, an important factor in promoting healthy lifestyles for students. When schools are located farther away from where students live, transportation costs can rise for school districts, and the area near the school encounters more traffic congestion, which also affects air quality. Schools can act as the heart and hub of a community.

Given the many ramifications that school locations have on the communities they serve, Summit participants acknowledged the importance of involving the entire community in making decisions about school siting. For communities experiencing growth in student enrollments, decisions must be made about expanding existing schools or building new facilities. This process can be challenging because many states have minimum acreage requirements that make it hard to build on smaller sites—sites that may be located within the neighborhoods of the student populations they serve. Expanding on existing sites can be difficult because of land costs and the expense of renovating older schools. However, participants felt that there are many benefits to keeping schools close to the neighborhoods they serve.



They suggested considering adding a floor or floors to existing structures. In addition, building or renovating schools can play a key role in revitalizing a neighborhood.

>> *John A. Johnson
Elementary School,
St. Paul, Minn.*



Courtesy of St. Paul Public Schools

“Our school facilities can, in fact, serve multiple purposes, bind our communities together and be a catalyst for neighborhood and community renewal. We see our nation’s public schools, then, as a gathering place—a place for lifelong learning for citizens of all ages and a place where communities can provide a host of other services to enhance community and student success.”

Chad P. Wick
President and CEO
KnowledgeWorks Foundation
Co-convener of the National Summit on School Design

Siting and Location Examples

St. Paul School Transforms Neighborhood

The John A. Johnson Achievement Plus School in St. Paul, Minnesota, is an example of a creative community-school partnership that has helped transform an older neighborhood. The community and school district worked together to turn an abandoned school building in a decaying neighborhood into a modern school facility for elementary schoolchildren. The school is co-located with a YMCA that provides programs to community members of all ages and serves as the gym for the school. Inside the school is a health clinic, a nursery, and space for adult education classes. Since the school opened, student test scores have improved significantly. The Johnson school is a good example of a school as a center of community.

Siting and Location: Challenges and Tradeoffs

Government regulations can restrict schools being located on small sites and the renovation of older schools.

Land availability often forces schools to select less than ideal locations for schools.

Siting must often take into account the segregated nature of many communities.

No site is perfect—equity needs to be considered in the community process.



Courtesy: St. Paul Public Schools

>> *Students at John A. Johnson Elementary School often live in the neighborhood and walk to school.*

A San Diego Model School Uses a “Smart” Approach

In California, San Diego City Schools is in the process of developing the San Diego Model School in collaboration with the city of San Diego and the city’s Housing Authority and Redevelopment Agency. San Diego seeks to create an “urban village” that will not only include the Model School, but also feature low- and moderate-income housing, joint-use recreational facilities, parks, a pedestrian-friendly design, a health clinic, a day care, and underground parking.

Rising partly out of the need to create a new school without displacing populations already in place, the project also recognizes the importance of community and other “smart-growth” considerations such as establishing a neighborhood that is accessible by walking. The project has been lauded as one sensitive approach to creating a school in a dense population zone.

Resources

Build “Smart”

<http://www.smartgrowthamerica.com/SGA%20School%20Sprawl.pdf>

Barbara McCann and Constance Beaumont, *American School Board Journal*, October 2003

Smart-growth schools are small, encourage broad community involvement, and make good use of existing resources. Promoting small, community-based schools requires innovation, new partnerships, and a commitment to working to overcome the barriers presented by traditional rules and regulations.

Designing a City of Learning: Paterson, NJ

<http://www.tcaup.umich.edu/publications/facultypubs/designing/designing.html>

Roy Strickland, New American School Design Project, 2001

This book presents concepts for using public school capital projects as tools for revitalizing a postindustrial American city. It applies the school design and planning strategy called City of Learning to historic Paterson, New Jersey. This strategy embraces educators' argument that healthy neighborhoods support successful learning and makes school design and programming holistic by looking beyond the school building to the school setting at the neighborhood, town, and city scales. The first section describes the framework of the City of Learning concept, which involves building schools as neighborhood foci and converting industrial and commercial facilities into schools. Subsequent sections present the plans for four non-traditional learning environments, using the city's rich architectural heritage, parks, existing schools, and libraries.

Land for Granted: The Effects of Acreage Policies on Rural Schools and Communities.

<http://www.ruraledu.org/site/apps/nl/content3.asp?c=beJMIZOCirH&b=1000115&ct=867213>

Barbara Kent Lawrence, The Rural School and Community Trust, 2003

In many states, receiving state aid to build a new school—or renovate an existing one—is contingent on compliance with state policies that regulate the minimum acreage necessary for a particular type of school. This report finds that these minimum acreage requirements—imposed in 23 states—often create special problems for rural school districts. This report explains the kinds of policies in effect in various states and outlines their effects on small and rural school districts.

Linking School Siting to Land Use Planning

http://www.atlantaregional.com/cps/rde/xbcr/SID-3F57FEE7-511A4505/arc/SCHOOLS_TOOL.pdf

Atlanta Regional Commission, 2003

This resource describes problems that arise when local governments and school boards do not cooperate on the planning of developments and school sites, as well as the benefits to quality growth that are realized when they do. Guidelines for interagency cooperation and implementation are enumerated, with lessons learned, best practices, case studies, and model agreements also provided.

New Schools for Older Neighborhoods: Strategies for Building Our Communities' Most Important Assets

<http://www.realtor.org/SG3.nsf/Pages/schforolder?OpenDocument>

Ann Kauth, National Association of Realtors, 2002

The case studies in this booklet highlight how five communities, in big cities and small towns, overcame the obstacles inherent in creating good new schools in existing neighborhoods. There is mounting evidence that small schools provide a better quality of education than large ones do. Among the obstacles faced in establishing new schools in old areas are (1) school building standards, codes, and regulations; (2) difficulty in acquiring land; (3) lost skills in building schools; and (4) the greater familiarity of building greenfield schools.

Public Schools and Economic Development: What the Research Shows

http://www.kwfdn.org/ProgramAreas/Facilities/weiss_book.pdf

Jonathan D. Weiss, KnowledgeWorks Foundation, 2004

This publication reviews the literature addressing the link between public schools and economic development. Information from academic research, organizational reports, and popular media is included. The review examines potential economic effects of public schools on national, state, and local economic growth and competitiveness and on real estate values. It also examines the effect of the quality, size, and condition of school facilities themselves. The research found a positive influence in the first two areas, with emerging research and anecdotal evidence supporting a positive influence in the third.

Schools for Cities: Urban Strategies

<http://www.arts.gov/pub/Design/SchoolsForCities.pdf>

Sharon Haar and Mark Robbins, National Endowment for the Arts, 2003

This monograph presents papers from the 2000 Mayors' Institute on City Design and the public forum that followed it. Essays include “Schools for Cities: Urban Strategies”; “Re-envisioning Schools: The Mayors' Questions”; “Why Johnny Can't Walk to School”; “Lessons from the Chicago Public Schools Design Competition”; “Something from ‘Nothing’: Information Infrastructure in School Design”; “An Architect's Primer for Community Interaction”; “The City of Learning: Schools as Agents for Urban Revitalization”; and “Education and the Urban Landscape: Illinois Institute of Technology.”

Schools for Successful Communities: An Element of Smart Growth

<http://shop.cefpfi.org/product.esim!?PID=103>

Council of Educational Facility Planners International and the U.S. Environmental Protection Agency, 2004

This publication provides guidance on choosing effective smart-growth locations for school facilities. It addresses new schools, existing schools, and the adaptive reuse of existing facilities for school learning environments. It also addresses the connection between smart-growth principles and community-centered schools, factors to consider when planning community-centered schools, and local and state policies that support smart-growth and community-centered schools. It provides 10 case studies that illustrate the concepts presented.

Travel and Environmental Implications of School Siting

http://www.epa.gov/livability/school_travel.htm

U.S. Environmental Protection Agency, 2003

This study examines the relationship between school locations, the built environment around schools, the ways students get to school, and the impact on air emissions of those travel choices. It provides information about the effect of school location on student transportation and shows that school siting and design can affect choices of walking, biking, or driving. In turn, these travel choices can affect traffic congestion, air pollution, and school transportation budgets. The trend toward construction of big schools on large, remote sites is sometimes dictated by state and local regulations. These regulations often overlook the value of renovating existing schools or creating smaller, neighborhood-based schools.

5

Create Schools as Centers of Community

Successful schools often are ones that have great support and involvement from the community and ones that are often open to the community as well. Summit participants recommended increasing community-school collaboration. School systems should foster partnerships with local cultural organizations such as museums and libraries, universities, and businesses to expand educational opportunities for students and more deeply engage the community in the school.

In some examples, schools are sharing public libraries or recreation facilities and are using museums as a place for greater learning opportunities. A number of school districts have built schools to serve as the center of the community so that facilities are used not only as a school but also as a place to house other community services such as community recreational centers, community resource centers, and performing arts activities. In those situations, the school becomes a central resource for the entire community, garnering greater support and playing an important role in the community's health.

Many participants acknowledged the pros and cons of integrating schools more into the fabric of the community. Mayor Donald Plusquellic of Akron, Ohio, a participant in the National Summit, told other participants how his city recently passed a multimillion dollar bond deal to finance construction of new schools. He said the community is supportive because the schools will also house recreational, cultural, and other facilities that can be used by the entire city. By involving more of the community in the schools, the community has more of a stake in the success and upkeep of these facilities. On the other hand, school and community leaders have to address potential issues of safety and security, upkeep, operational costs, and coordination when school facilities are shared spaces. In addition, participants felt school districts need more information about how to structure and administer partnerships to maximize the benefit to their schools and communities. They cautioned that partnerships can sometimes come with strings attached that may not be in the best interest of the school.



“21st century schools ought to be designed as community learning centers—facilities that are open year-round and for people of all ages. Adopting this concept requires a new working relationship between the school and the community that blurs boundaries that have been rigid in the past.”

Richard W. Riley

Former U.S. Secretary of Education
Speaker at the National Summit on School Design

Establishing a process for school-community dialogue is important to the success of any school that serves many purposes. “School officials need to be talking to mayors, city planners, realtors, and developers in addition to all the community-based groups that provide the extra services that so many of our children need,” said Secretary Riley.

Multi-use Facilities Examples



Photo: Peter Kerze. Courtesy of Cunningham Group Architecture, P.A.

>> *The Minneapolis Interdistrict Downtown School, Minneapolis, Minn.*

“For an urban school architect, it’s really important that schools become more a part of their community. People should view schools as a learning environment, not just a place you go.”

Tom Bluerock, FAIA

Thomas Bluerock Architects
Participant in the National Summit on School Design



Downtown Minneapolis School Forms Innovative Partnerships

In Minneapolis, the Interdistrict Downtown School has used creative partnerships and its downtown location to help benefit students and create an innovative school atmosphere with a focus on multicultural learning and experiential learning. Built on top of a for-profit underground parking garage, the school has fostered partnerships with nearby organizations, institutions, and businesses to increase the scope of its offerings to students. In addition, many joint-use facilities help maximize the resources of this downtown school. For example, the school shares gym facilities with a nearby YMCA and library facilities with the Minneapolis Public Library. Making use of those existing facilities saved the school district construction costs and has also led to unexpected collaboration and new approaches to learning. Further partnerships exist with the University of St. Thomas and various downtown businesses, which offer internships and other outside learning opportunities to students.



>> *The School of Environmental Studies, Apple Valley, Minn.*

“Zoo School” in Minnesota Gives Hands-on Opportunities

The School of Environmental Studies, which opened in 1995 in Apple Valley, Minnesota, a suburb of Minneapolis–St. Paul, is another well-known example of a successful community-school partnership. Also known as the “Zoo School,” this high school is located on the grounds of the Minnesota Zoo and offers a curriculum of hands-on, project-based, environmentally focused learning that takes full advantage of its surroundings and its partnership with the zoo. The “Zoo School” serves approximately 400 students in the 11th and 12th grades. It admits half of its students through a lottery system and the other half through an admissions essay.



>> *Students explore art at the Montessori Magnet School, part of The Learning Corridor in Hartford, Conn.*

Hartford School Campus Creates “Learning Corridor”

In Hartford, Connecticut, the innovative grouping of four public magnet schools on a 16-acre campus has allowed the creation of unique resources by sharing facilities and concentrating student populations, while keeping school size small. On the site are a Montessori magnet school, a magnet middle school, and two Greater Hartford Academies that teach high-level math, science, and arts. In addition, the campus is home to a performing arts center, a Boys and Girls Club, the Aetna Center for Families, and the Connecticut Valley Girl Scouts Council. This approach to grouping smaller schools encourages interaction among grade levels and among students focused on disparate subjects.

The Learning Corridor was the result of an extensive partnership network that includes the Southside Institutions Neighborhood Alliance, Trinity College, Hartford Hospital, the Institute of Living, the Connecticut Children’s Medical Center, Connecticut Public Television and Radio, and other stakeholders, including the city of Hartford and the state of Connecticut.

Resources

Catching the Age Wave: Building Schools with Senior Citizens in Mind

<http://www.edfacilities.org/pubs/agewave.pdf>

Kevin J. Sullivan, National Clearinghouse for Educational Facilities, October 2002

Examining the shift toward an older U.S. population, this publication discusses why educators and school facility planners should consider designing multipurpose schools that specifically contribute to stronger intergenerational links. Reasons include ending age segregation, enriching the lives of children and seniors, creating support for public education, and keeping seniors healthy and learning. The publication also discusses the challenges and opportunities of such efforts, including the diversity of retirees and issues of joint venture, funding, cost savings, accessibility, space (both finding it and using it wisely), new life for historic school buildings, security, and staffing. The publication includes numerous case studies and references.

Schools as Centers of Community: A Citizens' Guide For Planning and Design. Second edition

http://www.edfacilities.org/pubs/centers_of_community.cfm

Steven Bingler, Linda Quinn, and Kevin Sullivan, National Clearinghouse for Educational Facilities, KnowledgeWorks Foundation, Council of Educational Facility Planners, Building Educational Success Together, Coalition for Community Schools, 2003

This publication outlines a process for planning schools that more adequately addresses the needs of the whole learning community. It explores six design principles for creating effective learning environments, provides 13 case studies that illustrate various aspects of the design principles, and examines the facilities' master planning process for getting started and organized, including developing and implementing a master plan.

Schools as Centers of Community: John A. Johnson Achievement Plus Elementary School

<http://www.archfoundation.org/aaf/gsbid/index.htm>

American Architectural Foundation and KnowledgeWorks Foundation, 2005

This video and discussion guide showcase the transformative story of John A. Johnson Achievement Plus Elementary School—a struggling St. Paul, Minnesota, public school that is reborn as a beacon of academic excellence, design innovation, and community involvement. In keeping with the latest thinking in school design and planning, John A. Johnson opens its doors to the community so that it may benefit from local resources and offer social, fitness, and educational services in return. This 17-minute video, in DVD format, and discussion guide are part of AAF's growing Great Schools by Design resource library. The discussion guide will help local leaders, individuals, and community groups guide conversations about the topics raised in the video.



Courtesy of Andrew Goodman, PennPraxis

>> A conceptual sketch showing the close relationship between a school and its community.

6

Engage the Public in the Planning Process

Courtesy of Prakash Nair, DesignShare



>> Parents and teachers engage in a site planning workshop at the Duke School in North Carolina.

Summit participants agreed that there is a need to improve communication and engagement with and between the school community and the community at large. There is often a “language gap” when educators and designers talk about schools with parents and community residents. An open, two-way flow of information and feedback between the school and the community it serves are of benefit to both groups.

When a school district wants to embark on design and construction of new or renovated schools, an open public process is essential. A great deal of planning and time is required for a school district and community to plan this process. Participants recommended that the public process start early, allowing for community input long before final decisions are made. The public process needs to be inclusive of all school and community stakeholders, recognizing minority opinions. A professional facilitator can bring objectivity to the process and can help gain a consensus. It is helpful to start with a visioning process that allows all stakeholders to provide input about the role of the school in educating students and serving the community. It is important to allow

students to participate in the discussion process as well. The input from these visioning sessions should shape how the facilities are designed and supported.

Through the Summit preparation process and from Summit participants, it is evident that widespread efforts to engage citizens, educators, and students are practiced; however, participants report that often this activity is viewed either as simply a strategy for gaining public support for funding initiatives or as “window dressing” with little influence on the final design or decision making. Authentic community involvement will not only inform the final design but also build greater civic connection with public schools.

It is helpful to start with a visioning process that allows all stakeholders to provide their input on the role of the school in educating students and serving the community. It is important to talk about the skills students need to succeed in work and life. Students should be involved in these discussions as well. The input from these visioning sessions should shape how the facilities are designed and supported.

Public Process Examples

Philadelphia Inquirer and University of Pennsylvania Help Lead Philadelphia School Forums

The Philadelphia Inquirer editorial board and the University of Pennsylvania's Institute for Urban Research brought together more than 600 citizens to learn about school design as part of the Franklin Conference on School Design. During a series of public meetings and at a daylong charrette workshop, citizens interacted with school officials and architects to create visions for new and improved Philadelphia schools. They developed the Franklin Principles to help establish a framework for better-designed schools. These principles call for schools to be a

welcoming place; to achieve safety and security through smart design (“it’s a school, not a prison”); to encourage interaction; to offer flexibility, natural light, and good air flow; to provide healthy food and programs for exercise; to be built with conservation in mind; and to involve the community in the entire public process.



>> Participants at the Franklin Conference in Philadelphia

Courtesy of Andrew Goodman, PennPraxis

Public Process: Challenges and Tradeoffs

Organized opposition must be addressed.

Resegregation must be prevented, and equity ensured.

Economics versus education values may drive decisions (large schools versus small schools).

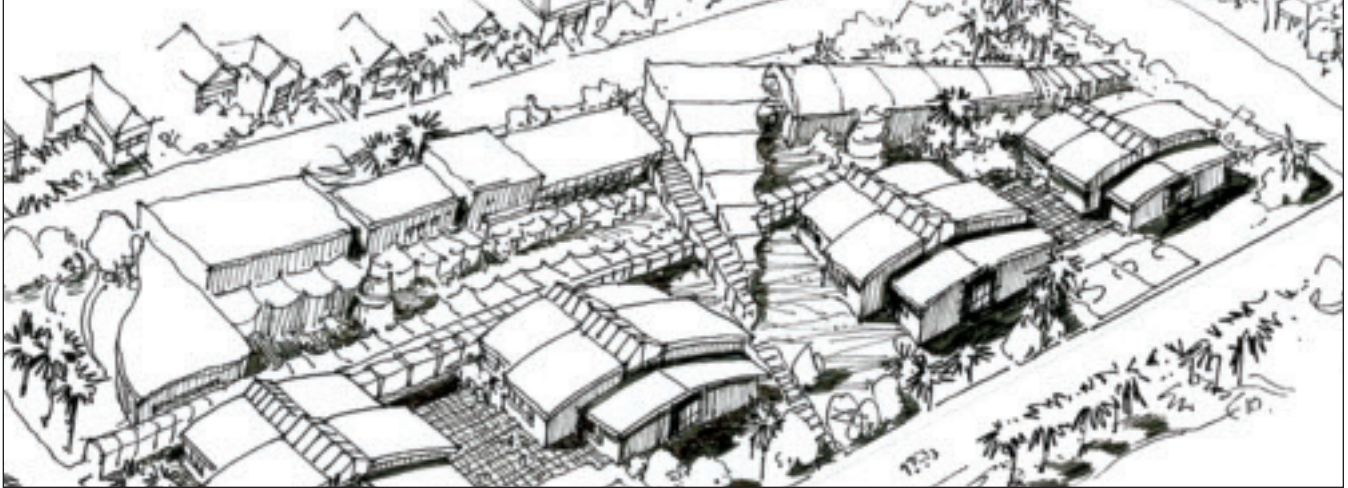
The process is lengthy and requires time, money, and patience.

Community members must be taught about school and education issues so that they are informed participants.

The impression that educators don't really want the public's input (an assumption that decisions are already made) must be countered.

Cincinnati, Ohio, Engages the Community to Create Community Learning Centers

In Cincinnati, Ohio, the school district has partnered with a community development organization to help create up to 22 community learning centers through a comprehensive community visioning process that involves engaging the community and school stakeholders to discuss how the school can be designed to be central to the community. Neighborhood residents of all ages are engaged in a visioning process well before the facility design begins, an approach that builds ownership. The community's aspirations, values, and hopes are then incorporated into the design decisions. In the end, the community learning centers are places designed for multipurpose use, are for people of all ages, and are open to the community beyond the usual school hours. These schools collaborate with and use community resources that support student and community success.



>> A drawing illustrates the “City of Learning” strategy where a school is closely integrated into the fabric of the surrounding neighborhood.

“City of Learning” Builds on Community Assets

University of Michigan Professor Roy Strickland, a panelist at the Summit, describes his approach to school-community planning as the “city of learning strategy.” He says every community has unique attributes that present opportunities for student learning. For example, an industrial town that has a polluted river should encourage students to learn about conservation. A city with a large medical complex should provide opportunities for student learning in medical and science fields. He has worked with school districts around the country to help them with school-community planning. One of his projects was in Paterson, New Jersey, where he gave kids an active role in the school design process. The Paterson School District turned an old church into a school for performing arts. The community has greater access to hear many of the kids’ performances at this facility. “If you put kids at the forefront of this process, they can play a role in changing the perspective of their city,” said Professor Strickland.

Resources

Community Collaboration

http://asumag.com/mag/university_community_collaboration/

Craig Mason and Jim French, *American School and University*, August 2004

This article describes the use of a design charrette involving architects, administrators, board members, facilities staff, students, and faculty to ensure that education priorities help shape the school building plan. Tips for preparatory steps, whole group presentations, breakout sessions, compilation of ideas, and facilitation are provided.

Community Involvement: A Win-Win Approach to School Facility Planning

http://asbointl.org/ASBO/files/CCPAGECONTENT/DOCFILENAME/0000006314/April04_SBA_Community_Involvement.pdf

T. C. Chan, *School Business Affairs*, April 2004

This article suggests objectives, activities, and implementation steps for organizing the community around school building projects. The information, feedback, and mobilization elements for a successful strategy are detailed.

For Generations to Come: A Leadership Guide to Renewing School Buildings

http://www.21csf.org/csf-home/Documents/Organizing_Manual.pdf

21st Century School Fund, 2004

This guide provides a framework for community involvement in modernizing or building new public school buildings. The process is broken down into the five steps of assessment, envisioning, planning, development, and implementation of the project. The chapters for each step include an overview of how facilities affect the quality of education and community and of how to initiate the process of improving a school building.

Public Engagement and School Facilities Conversation Workbook

http://www.kwfdn.org/resource_library/resources/workbook.pdf

KnowledgeWorks Foundation, The Harwood Institute for Public Innovation, 2004

Provides a workbook to assist community groups in engaging the public concerning school facilities. Meeting guidelines help organize the phases of the discussion, provide questions, and assist the facilitating of open, inclusive, and fair dialogue.

Worksheets help organize the results of the meetings. Steps for organizing the meeting are detailed, including recruitment of leaders and participants, troubleshooting problematic situations, setting the meeting, and setting up the room.

10 Principles of Authentic Community Engagement

http://www.kwfdn.org/resource_library/resources/10principles.pdf

KnowledgeWorks Foundation, 2005

It is common for school facilities planners to assert the need for community engagement in school facilities planning process.

A few key principles characterize authentic community engagement. This document provides a simple list of the top 10 principles to keep in mind as the community, school district, and designer engage in a school facilities conversation.

Community Engagement Guide

http://www.kwfdn.org/resource_library/resources/Comm_Eng_Guide.pdf

KnowledgeWorks Foundation, 2005

This guide defines community engagement and explores the 10 principles of community engagement while providing practical examples and lessons. It is an essential resource for community and school change efforts.

7

Make Healthy, Comfortable, and Flexible Learning Spaces

A school's design combines the physical structure, lighting, heating and cooling, acoustics, special planning, furniture, technology components, and the area around the school. Well-designed schools have been shown to have measurable benefits on student performance, attendance, and behavior. They provide teachers with flexible classroom settings to accommodate a range of learning processes. Research supports the contribution of many elements of design to improved student success.

Summit participants felt that there is a strong correlation between the aesthetics of school facilities and the message they send to students, teachers, and communities. Unfortunately, schools that are poorly designed or poorly maintained are all too common in cities across America. Not only are they often unhealthy for students, teachers, and others who occupy them, but also they send a message that the community doesn't care. Well-maintained and well-designed schools provide a welcoming, nurturing environment for learning.

During the National Summit on School Design, participants heard presentations on research and development trends on the classroom of the future from industry experts at Armstrong World Industries, Carrier Corporation, Cisco Systems, Inc., Herman Miller, Inc., and JELD-WEN, Inc.

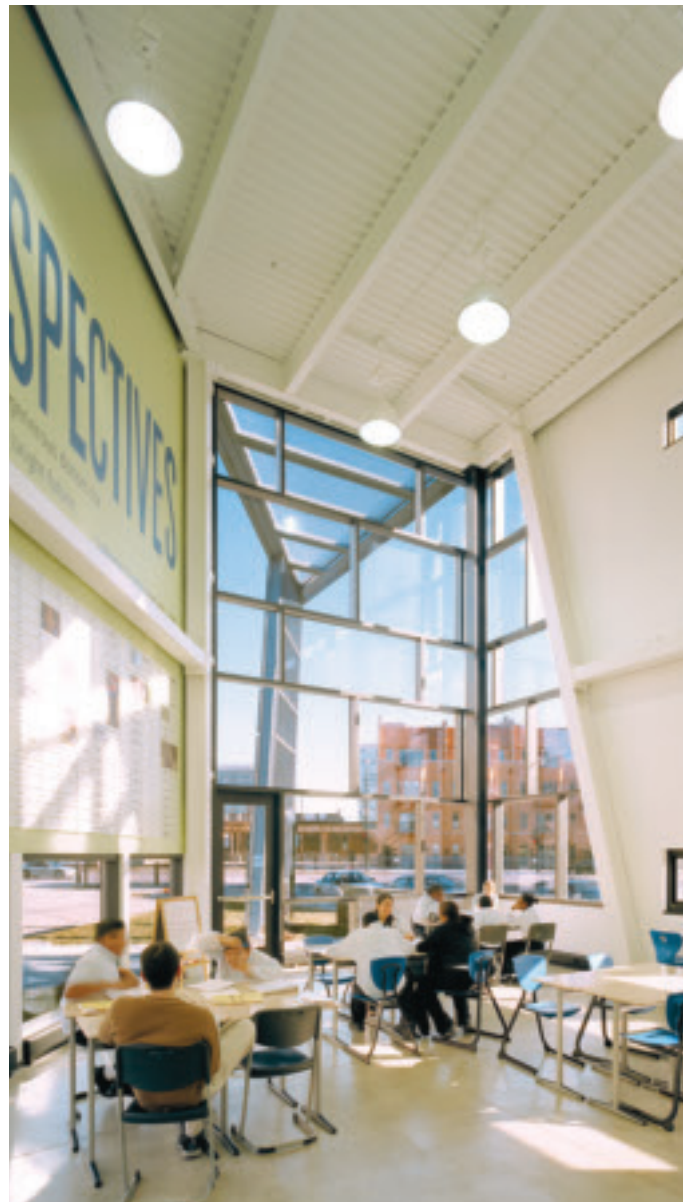


Photo: © JRS Steinkamp-Ballogh. Courtesy of Perkins+Will

>>
*Perspectives Charter School,
 Chicago, Ill.*

Industry Trends Affecting Quality of School Environment



Photo: Trudy Hutcherson

Heating, Ventilating, and Air Conditioning Systems

- Temperature distribution monitoring that can control and track temperature in all spaces in school building—even sections of a classroom
- Improved air filters to remove particulates and provide a healthy environment



Courtesy of Herman Miller, Inc.

Furniture

- Reconfigurable furniture in classrooms to support different learning situations
- Tables, storage, display boards, and seating that can be easily moved, offering greater flexibility



Photo: Trudy Hutcherson

Technology

- One network for data, voice, video, and wireless communication based on an Internet Protocol (IP) platform
- Building networks for monitoring and communicating lighting, fire, security, heating and cooling, and energy use, with the possibility of individualized controls
- Technology embedded in classrooms to support interactive whiteboards, easy Internet access at the desktop, and videoconferencing

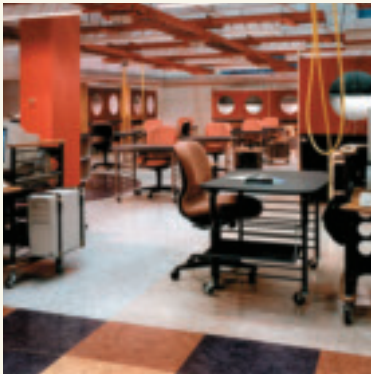


Photo: Scott McDonald @ Hedrich Blessing, Courtesy of Design Architect OWP/P

Design

- Spaces designed with learning scenarios in mind
- Focus on sustainable design in schools of the future



Photo: Kenneth M. Wyner, Courtesy of Grimm + Parker Architects

Lighting

- Emphasis on daylight in learning spaces
- Energy-efficient and aesthetically pleasing lighting



Photo: Trudy Hutcherson

Noise

- Noise monitoring in classrooms to maximize acoustic quality for all students

Resources

A Beautiful School Is a Caring School

http://asbointl.org/asbo/files/ccPageContent/DOCFILENAME/000000007496/SBA_June_04_BeautifulSchool.pdf

Delbert Jarman, Linda Webb, and T. C. Chan, *School Business Affairs*, June 2004

Beautiful school buildings are often associated with higher cost, extravagance, or both. This article reviews several studies on school building aesthetics and concludes that, in addition to promoting student achievement, a beautiful school building sends the message to parents and community leaders that the school district cares about the education of children by creating an attractive environment to support student learning. The community's appreciation may lead to constructive support of the school and its educational process. Consequently, the positive effect of constructing an attractive school for educational use cannot be underestimated.

A Summary of Scientific Findings on Adverse Effects of Indoor Environments on Students' Health, Academic Performance, and Attendance

<http://www.iehinc.com/PDF/effects%20on%20students.pdf>

U.S. Department of Education, Office of the Under Secretary, 2004

This report summarizes the state of scientific knowledge about the adverse impacts of school indoor environments on student health and performance. Key gaps in knowledge and critical outstanding research questions are also summarized. The report is based on a literature review that examined the relationships between indoor environmental quality in schools and the academic performance, attendance, and health of students. The evidence suggested that poor environments in schools adversely influence the health, performance, and attendance of students, but that overall inadequacies in school indoor environmental quality have not been systematically characterized.

Building Better Schools

<http://www.buildings.com/Articles/detailBuildings.asp?articleID=2609>

Jana Madsen, *Buildings*, July 2005

This article cites statistics on the condition of America's schools and the benefits of high-performance schools to students, teachers, the environment, the school owner, and the community. The top design considerations of indoor air quality, thermal comfort, lighting, daylighting, and acoustics are discussed and eight online resources are provided.

Building Blocks: How Schools are Designed and Constructed Affects How Students Learn

<http://www.asbj.com/2001/10/research.html>

Susan Black, *American School Board Journal*, October 2001

Studies show that deteriorating school facilities take their toll on students' and teachers' health and morale. Classrooms should be accessible to the outdoors, clustered around a commons, adaptable and flexible, and aesthetically pleasing. Architects say natural lighting and noise reduction are routine parts of their job. Research studies support the concept of small schools or subdivisions that create a sense of smallness. Sidebars list factors that school officials should keep in mind when choosing an architect and provide selected references.

Do School Facilities Affect Academic Outcomes?

<http://www.edfacilities.org/pubs/outcomes.pdf>

Mark Schneider, National Clearinghouse for Educational Facilities, 2002

This review explores which facility attributes affect academic outcomes the most, in what manner, and to what degree.

The data are examined in six categories: indoor air quality, ventilation, and thermal comfort; lighting; acoustics; building age and quality; school size; and class size. The review concludes that school facilities affect learning. Spatial configurations, noise, heat, cold, light, and air quality obviously bear on students' and teachers' ability to perform. Needed are clean air, good light, and a quiet, comfortable, and safe learning environment. The review asserts that such attributes have been achieved within the limits of existing knowledge, technology, and materials. Doing so simply requires adequate funding and competent design, construction, and maintenance.

Quality of School Environment: Challenges and Tradeoffs

Not all schools are easily adaptable. School designs need to be research based.

There is a tradeoff between durability and flexibility.

Turf issues exist with "schools within schools."

Prototype schools, when not modified, perpetuate "wrong" designs.

Environmental Design: Focusing on Human Factors

http://asumag.com/mag/university_focusing_human_factors/

James E. Rydeen, *American School and University*, August 2003

In designing schools, planners must use the criteria of health and safety, performance, comfort, and aesthetics to create a humanized physical environment that stimulates interest and provides motivation for learning and teaching. The human factors in design are sense of place, ownership, community, presence, comfort, security, aesthetics, performance, and privacy. Students must feel valued to stimulate performance. This occurs through psychological and physiological humanizing of spatial design elements.

Homes to Powerful Learning & Delight

http://www.essentialschools.org/cs/resources/view/ces_res/207

Herb Childress, Horace, Coalition of Essential Schools, Fall 2001

In America, school facilities usually promote economies of scale, separation of kids and adults, passivity of learning, and standardization of practice and outcome. Architecture almost never causes behavior directly, but it certainly makes some actions easier and others harder. The author believes that schools can be helpful, satisfying, and equitable places.

Architecture alone will not make them so, but buildings can be used to assist us in creating schools that are homes to powerful learning and delight.

Public School Facilities: Providing Environments that Sustain Learning

http://www.schoolfunding.info/resource_center/newsletter/Winter2004.pdf

Campaign for Fiscal Equity, *Access*, Winter 2004

Despite evidence demonstrating the importance of quality facilities, a number of obstacles impair efforts to build and maintain schools that are conducive to learning, including state funding systems that limit financial support and provide incentives to build schools cheaply and defer maintenance, a growing number of facilities requirements, and significant enrollment growth. Urban and rural districts face additional challenges caused by dense and sparse populations, respectively, and state policies that limit funding specifically for their school facilities. As a result of these barriers, countless students across the country, particularly those in urban and rural areas, attend school in substandard facilities that negatively affect their education.

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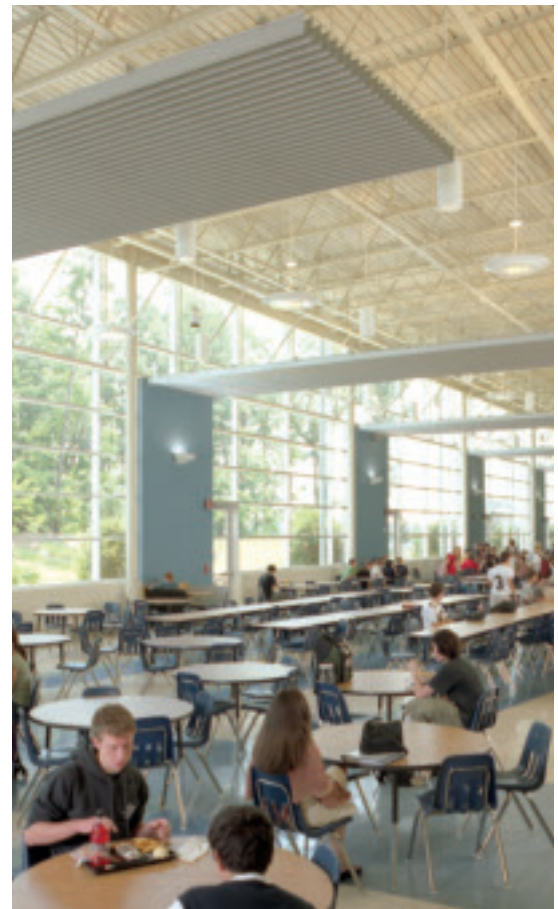
Consider Non-Traditional Options for School Facilities and Classrooms

In a number of communities today, students are learning in non-traditional facilities that redefine the concept of “school.” In Philadelphia and New York, some students enter a high-rise office building to attend classes. At the School of Environmental Studies outside Minneapolis, students spend part of their time at the adjacent Minnesota Zoo studying animal behavior, environmental science, and other topics and projects. Although there are more and more examples of such alternative spaces for educating youth, such spaces still represent a small proportion of the schools in the country and the \$30 billion being spent annually on new and renovated school buildings.

Summit participants encouraged school districts and communities to explore options for using alternative civic, retail, and other adaptable spaces. Many cities have community assets such as museums, colleges, research labs, and other institutions that offer the potential for experiential learning to take place. Participants felt that education needs to be connected to real-life applications and experiences—particularly at the high school level. Although student test scores and other measurement criteria have improved at some of the new learning environments, more testing and tracking of results is needed.

In the future, many large school districts will offer a variety of learning spaces—from comprehensive schools to small charter schools to themed high schools that are designed to better prepare students for careers. Charter schools are often most likely to seek alternative space because they don’t have the advantage of using existing school assets and built-in public funding.

For school districts and communities considering alternative spaces, there needs to be considerable dialogue. Issues such as safety and security, athletics and extracurricular activities, teacher and student acceptance, funding, and approvals all require great consideration from all the stakeholders. The participants noted these and other challenges and tradeoffs when considering the use of alternative spaces.



>> *Alpharetta High School Cafeteria, Alpharetta, Ga.*

Photo: © Chris Little, Courtesy of Perkins+Will

Traditional vs. Alternative Spaces Examples

Courtesy of Judy Marks



>> *Students use the museum and its collections as a learning tool at the Henry Ford Academy in Dearborn, Mich.*

Michigan Museum Drives Home Learning

At the Henry Ford Academy, the line between school and museum is crossed to great advantage for its 450 students. The creation of a school on the campus of the Henry Ford Museum has led students to explore the world through the lens of the museum's collections. Students are often set loose on the 90 acre museum site that includes 82 historic buildings such as Thomas Edison's laboratory and the Wright Brothers' bicycle shop. Students investigate these places as part of projects and classes, while learning in a way that is interactive, is engaging, and even teaches them about how a cultural institution is run. Classroom spaces at "the Henry Ford," as the museum is known, are also non-traditional. A student center

was created in a building formerly housing a carousel, classroom spaces were carved from a railroad depot, and railroad cars are used as classrooms. Henry Ford himself seemed to imagine such a collaborative learning effort, believing that young people can learn about their world by studying American inventions and ingenuity.

Bronx Charter School Brings Art to Life in Former Factory

The Bronx Charter School for the Arts opened in the Hunts Point section of Brooklyn in 2004. Located in an industrial zone that has been experiencing significant growth, the school is a renovated 1917 sausage factory. The renovation of the building, including a facade of colorful glazed bricks, has contributed to the perception of the school as a place where the arts are embraced. The school was founded by a coalition of educators, parents, and community residents in response to a critical need for quality education in the South Bronx.

The Bronx Charter School for the Arts is indicative of a larger trend in creating schools in urban areas where land is scarce: adaptive reuse. In recent times, adaptive reuse has involved the conversion of everything from churches to big box retail stores into schools. This phenomenon reflects a changing understanding of what educational facilities should and could be, as well as an openness to experimenting with the architectural form of schools.

>> *Students learn to express themselves through the arts in the light-filled spaces of the Bronx Charter School for the Arts.*



Courtesy of Bronx Charter School for the Arts

California's Pueblo Educational Village Finds Perfect Shop for School

The design for Pueblo Educational Village took on the challenge of converting an existing discount shopping mall into an engaging educational space for a large urban elementary school in southern California. The school was designed to accommodate “pods” of no more than 600 students each, with separate school administrative frameworks. In this way, the desire to house a large number of students became manageable and helped create a unique identity for each pod. The school also included various community and school services, such as child care and even commercial enterprises, that encourage interaction with the community and make the school an integral part of the surrounding urban environment.

To contend with the adaptive reuse of the shopping mall, the school district and architect imagined new and non-traditional ways of organizing space to encourage student learning. It is ultimately a small school model inserted in a much larger space. The additional space in the shopping mall allows for expansion and additional services. As more school districts contend with growing student populations, the reuse of such non-traditional spaces as shopping malls and big box retail stores promises to become more common.

Resources

But Are They Learning?: School Buildings—The Important Unasked Questions

http://www.designshare.com/Research/Nair/Are_They_Learning.htm

Prakash Nair, *DesignShare*, February 2002

This paper asserts that school buildings have been and continue to be places to warehouse children, and that new schools just do it in more comfortable settings. It suggests that an examination of the way most government agencies handle the business of school design and construction illustrates how the system is set up to systematically weed out any potential for a completely creative solution. The paper explains that although research is still sparse when it comes to evaluating the benefits of non-traditional learning spaces on learning outcomes, there is solid evidence that progressive methods of education do work when properly implemented, so it makes sense that school facility design should follow suit and support new teaching and learning modalities. The paper describes some innovative techniques and facilities for learner-centered schools: (1) using learning studios instead of traditional classrooms; (2) providing kivas, atriiums, and “learning streets” in place of corridors; (3) creating project rooms for project-based learning; (4) shifting from programmed rooms to resource areas; (5) establishing multiage groupings; (6) allowing for learning outside school; (7) providing for parent and community use; (8) including teacher workrooms; (9) establishing a place to think; (10) using technology as a liberator; and (11) creating living, not static, architecture.

Educational Infrastructure in an Age of Globalization: Intelligent Buildings, Virtual Facilities, and Virtual Instruction?

http://www.findarticles.com/p/articles/mi_qa4013/is_200210/ai_n9099718

MaryAnn C. Gaines, *Educational Forum*, Fall 2002

To ensure the most effective and up-to-date learning, educators should consider intelligent buildings that meet technological needs and flexibly accommodate change. Virtual schools alter the need for traditional physical facilities.

Out of the Box

http://www.findarticles.com/p/articles/mi_kmasu/is_200105/ai_kepm154081

Mike Kennedy, *American School and University*, May 2001

This article discusses how schools are using non-traditional settings to accommodate swelling student ranks and to create environments that encourage and inspire students to learn. It describes a school located in a shopping mall in Phoenix, Arizona, and a school located in a museum in Raleigh, North Carolina.

Traditional vs. Alternative Spaces: Challenges and Tradeoffs

Security and safety concerns in alternative spaces must be addressed.

The breakdown of the traditional comprehensive high school model may affect sports and other extracurricular activities.

Flexibility versus desire for standardization and predictability must be considered.

Jurisdictional restrictions, regulations, and zoning may restrict use of non-school facilities for school functions.

Equitable distribution of resources must be ensured, and needs of students with disabilities must be met.

School administrators and faculty may offer resistance.

Public-Private Partnerships Offer Innovative Opportunities for School Facilities

http://www.mdpolicy.org/research/pubID.68/pub_detail.asp

Ronald Utt, Maryland Public Policy Institute, 2005

The author describes increased spending on public school construction over the past decade, attributing it mostly to higher construction costs, a high-intensity replacement cycle for obsolete buildings, and the general will of citizens to spend more on school buildings. The experiences of some British, American, and Canadian public-private partnerships for school construction are then described, followed by federal and state legislation that assists in public-private development. Major financial and other benefits of public-private partnerships are illustrated, with detailed descriptions of types of agreements. Such partnerships include developer-proffered schools, community not-for-profit corporations, entrepreneurial partnerships, and community development districts.

The ABCs of Mixed Use Schools

<http://www.migcom.com/docManager/1000000053/Planning%20Article.pdf>

Jim Romeo, *Planning*, July 2004

This article cites several examples of school facilities in non-traditional settings that are integrated into and shared with the community. Benefits to land use, transportation, and community recreational opportunities are detailed.

Unconventional Offerings

http://asumag.com/mag/university_unconventional_offerings/

Steven Crane and Sara Malone, *American School and University*, August 2000

This article discusses creating spaces to support alternative (non-traditional) educational programs. It emphasizes the importance and the benefits of matching the facility to the curriculum and to students' needs. An example provided is the use of a retrofitted vacant office building in Salt Lake City to support a non-traditional curriculum there.

>> *A Cyber Cafe serves as a place to gather and collaborate at Blythewood High School, Blythewood, S.C.*



Photo: @JRS Steinkamp-Ballogg. Courtesy of Perkins+Will

Next Steps

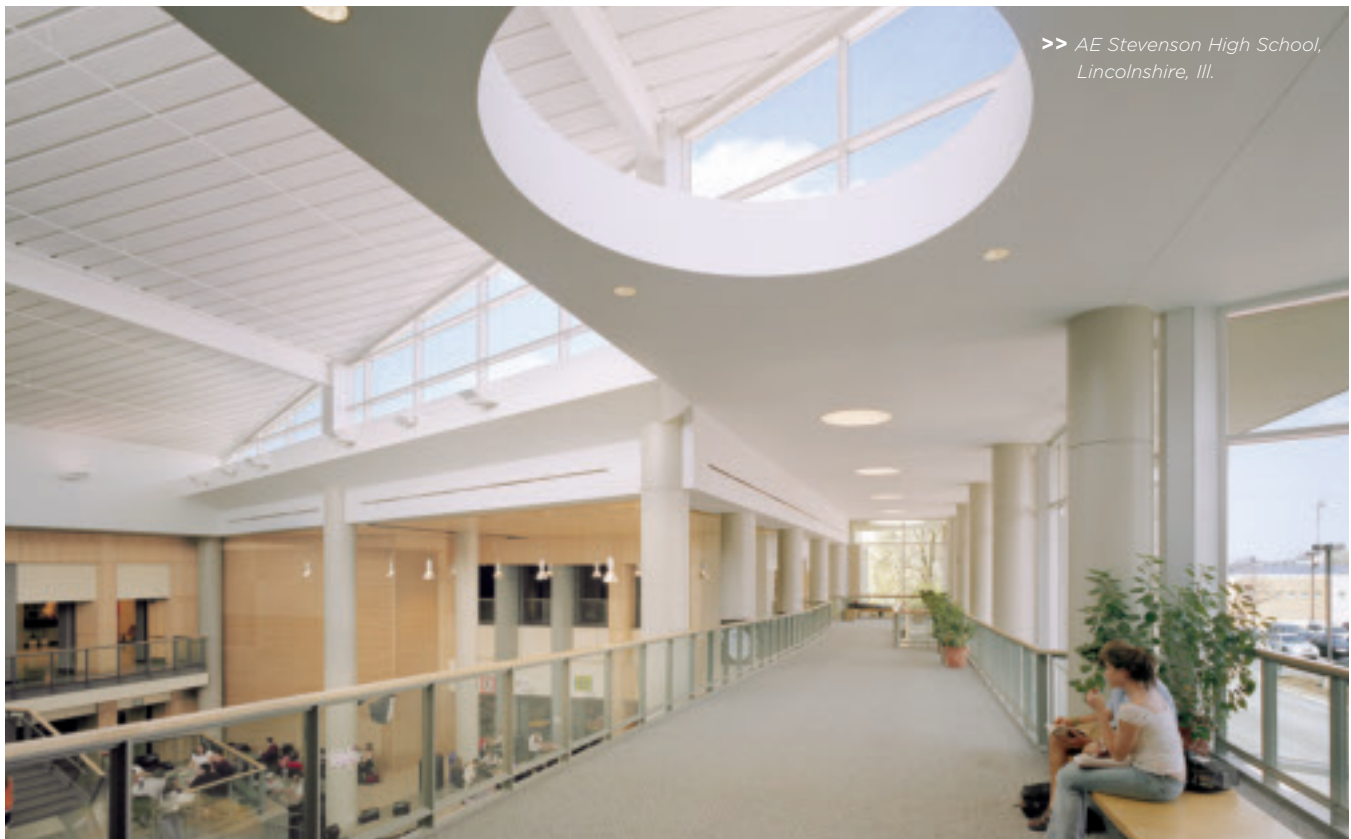
Advancing the National Agenda

The Summit participants provided a representative sampling of the many experts, stakeholders, and local education leaders in the United States. Their discussions revealed areas where additional research, discussion, and the exchange of ideas would lead to better outcomes and enriched opportunities for schools and the communities they serve.

Taking our lead from the recommendations of the Summit participants, AAF, KnowledgeWorks, and the many partners in the *Great Schools by Design* program, as well as other organizations, are committed to advancing the work started by the National Summit on School Design and to contributing to new knowledge and new strategies for design and construction of our schools. Leading this effort, national and international thought leaders, researchers, and stakeholders will be convened through a series of forums over the next two years to examine a range of topics in each of two broad areas derived from the Summit:

- Design for Learning
- Schools for Better Communities

The findings will help advance the knowledge required to guide school design in the decades ahead and to provide community leaders with greater resources to aid in decision making. Below are some of the topics under each of the two broad areas that we hope to explore in forums, research reviews, and white papers.



>> AE Stevenson High School,
Lincolnshire, Ill.

Photo: James Steinkamp@Steinkamp Ballig Photography. Courtesy of Design Architect OWP/P

Design for Learning

- **Student Achievement**—Research and experience demonstrate that the design of learning space can enhance student achievement. Issues such as daylight, acoustics, furnishings, and climate are known to contribute to student success. Thought leaders in education, design, and industry research and development will be engaged to explore further opportunities to support learning through design.
- **Classrooms for the Future**—Research has shown that not all students learn the same way. Learning environments must reflect and support a variety of teaching and learning styles. Education and design experts will present research and discuss trends to help shape the guidelines that should direct how we design classrooms in the future. Another important consideration that will be addressed is the importance of sustainable and “green” building components and their effect on children’s ability to learn and thrive.
- **School Size**—Communities across the country continue to wrestle with the relationship of school size and student achievement. Educators, policy leaders, planners, administrators, and designers will review current research, best practices, and innovative new ideas to advance new strategies for school districts that are dealing with this topic.
- **Technology and the Learning Environment**—Just as technology has transformed how we live and work, it has profound ramifications about how we learn and teach in our schools. How can technology help bridge the equity gap between school districts, and how can technology enhance learning and teaching?

Schools for Better Communities

- **Site Size and Location**—The suburban model for school design often prefers a large flat “greenfield” site. This model is often not appropriate in the urban context, yet in many states highly prescriptive site size requirements still direct local districts to construct schools on large remote locations. Many Summit participants feel strongly that greater flexibility in the location of schools needs to be encouraged.



Courtesy of St. Paul Public Schools

- **Safety and Security**—As one school board member who participated in the Summit commented, “All of these wonderful ideas about school design won’t matter if we don’t take care of the children.” But how do we improve safety and security without turning our schools into bunkers? The concept of community learning centers connotes openness and integration with the neighborhood fabric. Shared space requires school and community leaders to address the potential issues of safety and security, upkeep, operational costs, and usage. How can these public facilities be open and inviting to the community and, at the same time, provide a safe and secure environment? Experts in safety and security, along with educators, will explore the sensitive solutions to this challenging design issue with designers and product manufacturers.

>> *At John A. Johnson Elementary the community is part of the life of the school.*

- **Community Engagement**—The importance of community and school collaboration is generally accepted, particularly regarding the development of community learning centers and the safeguarding of neighborhood schools. Experts will be asked to develop guidelines that help communities and school leaders conduct authentic dialogues that can lead to greater understanding and collaboration in community-school issues.

- **Partnerships** – Increasingly, communities and schools are seeking partnerships with both public and private organizations to help fund and support education and school initiatives. Examples of institutional partnerships that are forged with school districts include collaboration with private developers, local businesses, recreation organizations, conservation and historic preservation organizations, medical centers, museums, and universities. These partnerships encourage a range of interdisciplinary and collaborative experiences for students.
- **School Financing** – Summit attendees noted a lack of information regarding financing. What are the creative strategies for school financing? Are there new financing models emerging? How have communities found new sources of funding through partnerships, multi-use facilities, and other strategies? Are there examples of city/school initiatives that create greater funding opportunities for school construction?
- **Sustainable Design** – Discussions at the Summit suggested that while principles of smart growth and sustainable design are widely accepted, they are not widely implemented. Additional strategies must be formulated to advance these principles. Developing new schools and renovating existing facilities can have a major impact on growth, and it is important to remember that environmentally sensitive design relates to siting, design, and even building materials. Improving urban schools can assist in maintaining a downtown residential population and prevent development on the fringe of urban areas. Community development and the importance of neighborhood school facilities should also be understood as a component of sustainability. Are there other opportunities for creating long term sustainability in our schools?

Recognizing School Design Excellence

While excellence in school design has not yet become a universal norm, there are many examples of superior school design across the country. An important component of the *Great Schools by Design* program is the recognition and celebration of school design excellence. Through videos, publications, and awards, AAF and KnowledgeWorks, as well as other organizations, highlight successful schools that foster student achievement and serve their communities. These examples of excellence can become models to inform and inspire other communities to achieve similar success. Below is more information on our work and plans in identifying and elevating excellence:

- **Video Series**—AAF and KnowledgeWorks produce documentary videos that profile school design excellence. The first video in the series is the award-winning documentary on the John A. Johnson Elementary School in St. Paul, Minnesota—an example of a school as a center of community. The second project features the Denver School of Science and Technology—an example of design in support of learning in a small school environment. Additional videos are planned to highlight other best practices around the country.
- **Publications**—White papers, articles, findings from the School Design Institutes, and other publications such as this National Summit on School Design Report are developed to help school and community leaders become more informed about leading issues in school design. The new knowledge, information and strategies developed in continuing the work of the National Summit will be widely disseminated.
- **Awards Program**—In 2007, AAF will introduce the annual *Great Schools by Design* awards program to recognize schools where the design has helped contribute to academic excellence.

Throughout the planning and facilitation of the National Summit on School Design, AAF and KnowledgeWorks relied on the expertise and contributions of many organizations and individuals as well as the Summit participants. The *Great Schools by Design* initiative is one of several programs in the United States devoted to supporting student achievement and educational excellence. Our success depends on the continued commitment and involvement of our alliance partners, experts in the field, and thousands of individual school stakeholders throughout the country. We look forward to helping to lead this national initiative for schools designed for learning and schools for better communities.

Transforming State and Federal Policies

State and local governments have a powerful and ongoing role in financing school construction and defining the rules and regulations that define siting, size, and environmental sustainability to name just a few areas of intense interest. In addition, there are currently 23 ongoing legal challenges to the constitutionality of K-12 school funding. School funding cases have led to increased funding on facilities in Arizona, Arkansas, New Jersey, New York and Ohio. An increasing number of big city mayors from New York to Chicago and Los Angeles have also stepped up to the challenge of reforming education and improving facilities. State policies can enhance school design, encourage the use of smart growth principles, and foster green schools. However, outdated state regulations can hinder and prevent creative school/partnerships. AAF and its partners will bring experts together to develop creative models and policy recommendations to guide state legislatures and policymakers with a particular focus on ensuring greater flexibility regarding site and size determinants.

While the federal government has historically played a limited role in school construction, its role is evolving on a growing number of fronts. The Environmental Protection Agency is a national leader in efforts to improve indoor air quality and other environmental health issues related to schools. The Department of Education funds the National Clearinghouse for Educational Facilities through the Safe and Drug-Free Schools Program and has created two new programs to help finance charter school facilities. The National Trust for Historic Preservation and the National Endowment for the Arts have also been active players in preserving historic buildings and encouraging excellence in school design. In addition, the federal tax code includes several provisions including Qualified Zone Academy Bonds (QZABS) and New Market Tax Credits that encourage innovative financing for school facilities. Given the current level of federal involvement in school facilities, AAF and its partners will ask experts to consider how federal programs can be sustained and expanded with a special emphasis on how the federal tax code can be used to encourage and finance creative school and community partnerships.

Appendix

School Design Principles

Since the early 1990s, a number of national and local organizations have crafted excellent guidelines and principles for good school design. Each effort sought in its own way to reflect the latest research on learning, teaching, organizations, materials and design. AAF incorporated the findings and recommendations of these efforts when developing *Great Schools by Design*. AAF then added to this effort through numerous interviews, focus groups and forums with school design stakeholders across the country. This work framed the objectives for *Great Schools by Design* and set the groundwork for the National Summit on School Design.

The principles listed below summarize the knowledge gained from AAF's efforts and the research and work of other organizations, experts, and thought leaders. A list of resources that helped form these principles is also provided.

Six Key School Design Principles for the 21st Century

A well-designed school should:

- **Support Teaching and Learning.** Weave virtual and physical learning spaces to meet students' diverse learning needs. Provide spaces of different shapes and colors for a variety of learning activities involving different size groups. Enable activities ranging from large, hands-on, team projects to quiet personal reflection. Provide quiet, private study areas that are well-separated from noisy areas. Give teachers practical and stimulating teaching spaces, as well as good personal work spaces. Offer strong spaces to display and celebrate student work. Offer outdoor environments for educational activities and experiences that can't be done indoors. Function as a "three-dimensional textbook." Encourage strong, active school leadership by decentralizing administrative spaces. Provide spaces that enable mentoring, externships and distance learning.
- **Be Safe and Healthy.** Build safety and security into the design, avoiding intrusive, prison-like measures. Establish clear boundaries between public use and school use, buffer and protect walking paths outside the school from traffic and service areas. Provide clear sight lines and design inside traffic patterns carefully to maximize safety and supervision. Provide excellent air quality, localized heating and cooling controls, windows that open, and natural/task-appropriate lighting - all of which research has shown to improve learning.
- **Be Sustainable, Clean and Green.** School sites should be highly integrated in their community and support the principals of smart growth. Site selection and planning should be highly coordinated with the surrounding community and its development planning. Use designs, mechanical systems and lighting systems that conserve water and energy. Use renewable energy where possible. Use building materials that are environmentally responsible and result in healthy interior environments for students and teachers.
- **Be a Center of Community.** Design schools to serve both as symbols and centers of their communities. Build schools that draw the community in with a sense of welcome. Scale the design to the surrounding neighborhood. In a school's public spaces, inside and outside, provide icons that invite pride in the school's and the community's shared traditions and sense of purpose. Make schools easily accessible by walking, car or mass transit. Enable schools to become centers of civic participation and recreation. Where desired, integrate shared uses such as neighborhood health clinics, libraries, or recreation centers. Where practical, renovate older schools that play an important role in the history and fabric of their

neighborhoods. Incorporate the neighborhood and its assets (social, cultural, natural) into the students' learning environment. Conversely, make sure the school provides spaces for its community partners in learning and for lifelong learning activities.

- **Be Based on a Public Process.** Engage the public, in all its multiple perspectives, in a meaningful and authentic processes when envisioning and designing schools. Go beyond the obvious stakeholders – parents, teachers, students – to include community groups, the business community, senior citizens, local colleges, taxpayer groups and other government officials. Listen to and value public input, respecting diversity in age, culture and gender. Provide honest and transparent information about cost and financing. Use an open and inclusive process of design and construction to build trust between schools and community.
- **Be Practical, Cost Effective and Flexible.** Use designs and materials that are easy to use and maintain without sacrificing aesthetics. Design and build to optimize public investment. Use all available resources, including up-to-date technology and community resources that can provide alternatives to traditional classroom spaces, cultural diversity and technology. Use a “life-cycle cost approach” that reduces the total costs of ownership. Ensure the flexibility/adaptability of places, because part of being cost effective is planning on changes in curriculum, technology, programs or community needs.

Resources

12 Design Principles Based on Brain-Based Learning Research.

Summary of a workshop conducted by Jeffrey Lackney at a Council of Educational Facility Planners International conference, Minneapolis, Minnesota, May 6, 1998. <http://www.designshare.com/Research/BrainBasedLearn98.htm>.

Children, Learning & School Design: A First National Invitational Conference for Architects and Educators.

Papers from a conference marking the 50th anniversary of Crow Island School in Winnetka, Illinois, held in November 1990 to examine how collaboration between educators and architects could be advanced to meet the nation's pressing need for new and renovated school buildings.

High Performance School Buildings for All Children: A Declaration and Call to Action.

Developed by the Wingspread Symposium Steering Committee on Healthy Schools by Design of the Funders' Forum on Environment and Education (F2E2) and by the Building Educational Success Together (BEST) partners of the 21st Century School Fund, following the March 2003 Wingspread Conference on “Designing Healthy, High Performance Schools.” <http://www.johnsonfdn.org/Publications/ConferenceReports/2003/HighPerfSchoolBldg.pdf>.

Design Principles from the Franklin Conference on School Design, June 2005.

These principles are the result of a series of five public meetings in different sections of Philadelphia during which citizens discussed what they wanted in schools for their children and in their communities. <http://www.upenn.edu/penniur/civic/franklin/doc/principles-final.doc>.

National Symposium on School Design.

Six design principles originally presented to U.S. Secretary of Education Richard W. Riley at the National Symposium on School Design in Washington, D.C., October 1998. Published in *Schools as Centers of Community: A Citizens' Guide for Planning and Design*, 2003. http://www.edfacilities.org/pubs/scc_Six_Design_Principles.pdf.

The Jefferson Center Principles of Good Educational Design.

Principles presented by Daniel L. Duke, director, Thomas Jefferson Center for Education Design, University of Virginia, at the 1999 Rowlett Lecture Series “Transitions to Schools of the Future” February 1999. <http://web.archive.org/web/20031204234313/http://www.tjced.org/PDF+files/The+Jefferson+Center+Principles.pdf>.

Thirty-Three Principles of Educational Design, 2003.

Framework presented by author Jeffrey Lackney of educational design principles from which educators and design professionals can structure the content of their educational facility development process, from the earliest strategic and educational planning stage, to design, construction, occupancy, and facility management. <http://schoolstudio.engr.wisc.edu/33principles.html>.

Lessons Learned: Scenario-Based Problem Solving

During the Summit’s scenario workshop sessions, participants were divided into interdisciplinary teams of about 20 members. Each team was presented with a detailed scenario describing the challenges facing a hypothetical school district. Each group was asked to imagine that it had been assembled as a blue-ribbon advisory panel to the district described in the scenario. The job of the group was to identify the key issues confronting the district, plus the tensions and opportunities embedded within those issues. Then the group was asked to suggest strategies and solutions the district could use to deal with its challenges. Two different teams worked on each scenario to ensure a diversity of opinions.

General Observations

One of the unique and most rewarding aspects of the Summit resulted from the diversity of the participants and the wide range of views and issues that they brought to this exercise. Participants came to discussions of school design with diverse perspectives, which often challenged the traditional approach that school districts take when designing school facilities.

For example, teachers and community leaders insisted on bringing to the table issues regarding teaching styles, equity, and neighborhood revitalization. Others, who initially pressed to get immediately into the design details, came to realize that school design is not just about creating a facility, but about the role the design process can play in clarifying objectives and the importance of the school in serving the community and defining community values.

Summit participants reacted positively to the experience of discussing these problems with people of very different expertise, backgrounds, and points of view. As one participant noted, “I was skeptical about being asked to do a scenario like this. Now that we’re doing it, I’m getting excited. We’re doing what any school planning board needs to do to decide how to meet the needs of its students. And there are society problems that we are addressing. This is the most real discussion I’ve had in a long time.” These scenario workshops resulted in a number of broad lessons that are reflected in the Summit recommendations. The first lesson suggests that communities, regardless of whether they are rapidly growing or struggling to avoid consolidation, will always have to view the issue of school design with a great deal of sensitivity to equity and the identity of a community. Whether that identity is reflected in the heritage of an old beloved building or is defined by a rich sports tradition, the identity of a community matters a great deal when it comes to school design.

Second, the design of any facility has to be seen in a broader community context. The issue is not just the building itself, but how it relates to the community, how the facility can be designed from the very start to enhance school and community partnerships, and how the school can be more inviting to the wider and broader community.

The third lesson is that creating an authentic process of community engagement can allow communities to bring to the surface real and substantial concerns as well as creative solutions. The school as we know it, for example, does not necessarily have to be a stand-alone building, and creating new links to other civic institutions, from the arts to museums, is an attractive option. The scenarios make clear, however, that while many participants are eager to promote the idea of partnership, the “how to” and “who does it” remain problematic.

As in any field, “silo thinking” also exists in education and school design. The scenario workshops engaged participants in a process that led to thinking about school design problems in a holistic way—to which many were not accustomed. As a result, the discussions produced many creative leaps and some surprising moments of consensus.

Summary of Scenario Results

Faber

Faber School District

A large school system in an eastern seaboard city, Faber is used to dealing with typical urban problems of poverty and limited resources but suddenly faces a new challenge. A huge influx of young professionals into its urban core creates an urgent demand for new, quality schools in the downtown and adjoining neighborhoods. How can Faber serve these demanding newcomers without damaging equity for its other schools?

Key Ideas

Go from Smokestacks to “School Stacks”

Both groups were intrigued with the idea of locating schools in the old industrial and commercial buildings downtown. These school-centered redevelopments would also include appropriate retail, commercial, and nonprofit spaces that would help in the cost of design and construction. In high schools, these co-located schools could provide opportunity for internships and learning opportunities to the students. A huge impediment would be state regulations that don't contemplate this sort of co-location and might effectively prohibit it.

Go from Blacktop to Green Tops

Limited space for outdoor exercise and recreation was cited as a chronic problem of urban schools. The groups were eager to develop designs for rooftop exercise and recreation spaces, and they also wanted to see renovations that added trees and grass to cramped school campuses that often have been paved over. In addition, there is an opportunity to partner with nearby recreational facilities.

Partnering Is Hard to Do—But Vital

Faber was rich in opportunities for schools to partner with cultural institutions, nonprofits, and businesses, but participants observed that school leaders frequently have no idea how to make or sustain those partnerships. Many participants made the point that the burden should not totally be on the outside partners to step up and solve problems. Educators have to develop the skills to be good partners. Several groups noted that design obstacles limit the development of promising partnerships. These obstacles include the lack of appropriate, welcoming spaces for partners to enter the school to run programs; partnerships that involve students leaving the building to visit partner sites, then returning, create issues of ingress, egress, and security that require good, sensitive design to resolve.

Fill the Evenings with Empty Nesters

Faber was becoming very attractive to empty nesters seeking downtown condos. The groups suggested that this new development trend created an opportunity to build support for schools from empty nesters, who often have no direct link to the school, by giving them wider access to the facility at night and on weekends. However, creating new opportunities for empty nesters would require schools to address issues of security and open versus secured spaces inside the building, as well as the flexibility and durability of spaces and furnishings.



Create a K-16 Corridor of Learning

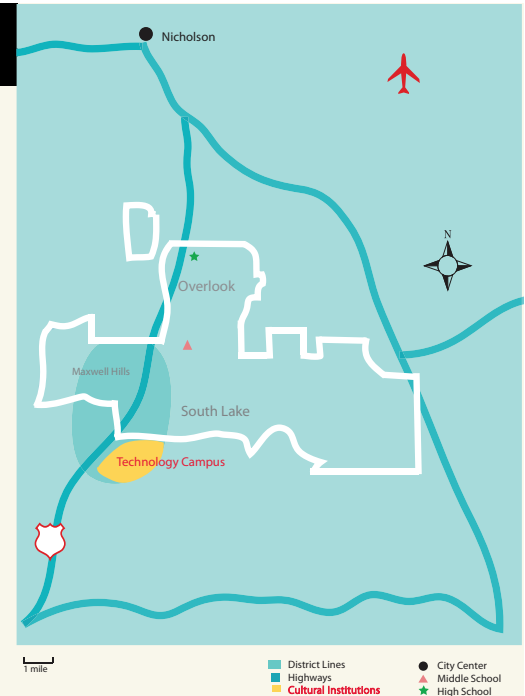
One group saw an opportunity to partner with one of the city universities to create a “corridor of learning” inside the city—a zone of the city given wholly over to education and culture, planned for those purposes, with a mix of elementary and secondary academies, cultural institutions, and college facilities. Participants recognized that the creation of such a corridor would immediately raise issues regarding access and equity for students from the rest of the city.

Overlook

Overlook School District

A regional school district in the inner-ring suburbs of a Rocky Mountain city, Overlook serves two distinct communities—a mature, middle-income community bordering the city and a more affluent growth area further out. The district’s high school, located near the city line, is old, large, and crowded. Its test scores are declining as its turbulence increases. Parents in the new-growth area clamor for a new high school of their own. How can Overlook create high schools for the 21st century while managing issues of intradistrict equity and parental expectations?

The Overlook groups seemed to engage well with the scenarios and enthusiastically explore options. They, too, were very concerned about the equity issues posed by the scenario but had less trouble confronting them on the scenario’s own terms. These groups had a very good discussion about the common suburban problem that this scenario posed: building a new high school out in the high-growth, high-income sector of a regional district leaves residents and students left with the old school in the older section feeling like second-class citizens. Each group felt strongly that avoiding that result should be the priority of any plan.



Key Ideas

Devise a Plan for Equity

The groups were adamant that this district should end up with some open enrollment concept, which would give kids from the older part of the district a shot at attending whatever newer schools were built, and that the old high school should be improved enough so that those who continued to attend it did not feel cheated. This approach underlines the point that school designs pursued in isolation from the equity and community issues that are apparent inside a school district are doomed to be unpopular and to miss opportunities.

Create a Campus of Academies

Both groups tried, with different nuances, to articulate a notion of solving the equity, crowding, and aging issues by creating a network of high school academies around the district through which students would cycle, either year to year, or within years. This approach raised two possible design problems: (1) How would a single campus of academies that serve different populations and goals look and work, including issues of internal circulation and transportation to and from the site? (2) How, in a suburban school district of moderate geographic scope, could you create a scattered network of academies that were still organically connected, whether through technology or other means?

Cheer, Don't Boo, What Sports Can Do

A history of sports success was a significant factor in this scenario. The groups did not downplay this issue; they took very seriously the role that sports and other extracurricular activities play. What they wanted was for the various academies to also have one central identity for sports (and perhaps a shared band, etc.) This approach raised design issues as to how to site and design athletic facilities for use by students from scattered campuses in a way that creates and cements a joint identity for sports teams.

Project Learning Lets You Project Fewer Seats

This scenario was full of opportunities for partnerships and externships with tech companies. The groups pointed out that such project- and externship-based learning should change classroom space projections for 21st century high schools and perhaps create needs for spaces that don't now exist in most high schools.

Potterville

South Potter County School District

Three small rural school systems outside the southern university town of Potterville face a state mandate to merge, a situation that has their communities in an uproar. The three systems have a motley collection of very small schools; several in each have been rated inadequate in a state facilities survey. The merger mandate comes with a carrot of some money for capital projects. How can the new South Potter County Regional District decide which schools to close, which to renovate, and which to build new, while coping with swirling community tensions?

The Potterville groups also dug eagerly into the scenarios. One participant noted, "This little place is suffering from the same things that a lot of places do: the rural isolation, the economic struggles, which in some ways don't have a darn thing to do with schools, but have everything to do with schools." Each group was struck by how important a good community process would be to untangling a decision where top-down, insensitive state mandates had complicated what was already an edgy situation.



Key Ideas

2,4,6,8—Let's Not Consolidate!

The groups in some ways replicated the communities in the study in chafing at the mandate to consolidate schools. In particular, they felt it would be a mistake to close the small, historic school in one far rural corner to make students ride the bus an hour to school. As one person put it, "Don't close a school that's the one icon they have. It's the nail in the coffin for that community." Yet the group did see some opportunities to innovate with siting and school organization to benefit kids. Most felt that eliminating middle schools and creating K-8 schools, one for each main town in the scenario, made sense.

Some participants questioned whether parents of first graders would have issues with sending their children to school with teenagers. This concern raises a recurrent design issue worthy of future study:

What are the design techniques to enable the 21st-century version of the K-8 to thrive, given modern parents' security concerns and contemporary practices of student-to-student teaching and so forth? As in the Overlook groups, a great deal of discussion was devoted to how to design a multicampus or "cluster with a fuzzy edge" high school that would serve the whole consolidated district, reinforcing its new identity, yet still keep a foot, a presence in each rural center. Also, one person recommended moving the vocational-tech operation back into the regular high school as a way of breaking down the working class-elite divisions that exist in this community.

Use Civic Engagement to Heal

The groups noted that it's too easy and too common for communities to squabble over dueling solutions in circumstances like this, without ever bringing to the surface the issues that are really driving the disagreements. Potterville, they said, needs to get out from under the divisions the state mandates has generated by convening a community dialogue that aims to develop a shared vision for the education of its children. The plan for how to close, renovate, or build new should be built upon that shared educational vision, not substitute for it.

History Need Not Cost More

Potterville has some very old and some not so old schools. Some participants cautioned against assuming that the older schools should be targeted for closing, the newer for renovation. The old schools, they suggested, might actually be more sturdily built, more suited for the educational vision, and cheaper to renovate than those built in the 1960s. The participants made the point that "age" may be less of a factor than "quality" and that a study on cost-effectiveness tradeoffs of renovating old schools versus new schools might be warranted.

"Is the Building the School?"—Storefronts as Magnets

Participants caught on to the potential of empty storefronts in the small towns as school sites, but this discussion did not fully develop to a conclusion. One reason was that most of the participants in the room did not have in their heads vivid, real-life models of how such renovations that would look, work, and feel. Here is a case in which compiling a report on examples, techniques, and tradeoffs of such an approach might provide valuable insights to rural and inner suburban communities that are struggling with the issues raised in the Potterville scenario.

Teens Ride, Kids Walk (But Make K-8 Great)

The groups agreed that a first principle for districts facing Potterville-type decisions is to try to keep elementary schools as small, walkable, and neighborhood based as possible. Busing high school students was seen as far less problematic; some participants reported that they have teenage kids who actually enjoy long bus rides for socializing and doing homework.

The group saw many reasons, from cost to education to community identity, to go with a K-8 configuration instead of elementary or middle schools. Different design issues arise when converting to K-8 from an elementary or middle school configuration.

Silverado

Silverado & Keno County School District

Silverado is a southwestern Sun Belt city experiencing explosive growth. The Keno County School District must find new space for as many as 12,000 new students a year. It has been building new schools, based on prototype designs, as fast as it can—and has done a pretty efficient job of it. But Silverado must now deal with questions being raised about its frantic school building program: Is it fueling wasteful sprawl? Is it impeding educational innovation? Is it poorly serving the needs of lower-income students in the urban core?

This scenario was large in scope and, as a result, the conversations about this rapidly growing county led participants to confront the larger policy issues of sprawl, financing, and equity. This quote from a participant seemed to sum up the consensus: “The rate of growth is so huge they don’t have time to think. Buying time for planning is the biggest issue they face.” A lot of interesting discussion developed around the question of whether design prototypes are really as a bad a thing as some assume.



Key Ideas

Find the Virtuous Band-Aid

Several people suggested that Keno county was caught in such a breathless race to build new schools that it might actually be good idea to force some communities, schools, and students to endure some temporary quarters and solutions, just to give the district time to take a deep breath and reassess. People drew on Russ Ackoff’s talk about “Doing the Wrong Thing Right,” in which he observed that sometimes you have to weaken one part of a system to strengthen the system as a whole. Some also suggested that maintenance costs were a hidden time bomb in the rush to build new facilities and that it might be better to take a pause for a few years, use existing capital money to do repairs and maintenance on the urban core schools whose decline was an equity issue, and wait to see the real life-cycle costs of the prototype-driven new schools.

Find a More Perfect Prototype

Though many had the typical architect’s and educator’s distaste for mandated prototypes, some rose in defense of the concept, if not the particular ones Keno County was using. When one is building at the pace and scale Keno County is, some argued, prototypes are a sensible way to save money, keep things simpler, and attain consistency. The trick is to have prototypes that are flexible, so that they can be adjusted to the particular nature of the site and particular flavor of the school community. Some study of how to move from inflexible, command-and-control prototypes to efficient, effective, flexible prototypes would be warranted.

Practice Smart Growth

Many participants noted that Keno County’s school program seems utterly disconnected from any regional growth planning and, in fact, seems to be inadvertently fueling growth. Keno needs to be more cognizant of where highways and developments are being planned, and the community generally needs to be more

aggressive in shaping and channeling development. Several people said Keno and Silverado need to understand that the best way to slow the frantic growth on the suburban edge is to make the urban schools and neighborhoods more attractive. They also said that developers on the edge should be told or given incentives to build smart-growth developments with clusters that ought to include schools. Some even said that the urban idea of multistory buildings with schools on the lower floors and commercial uses higher up should be tried in the “edge city.” Several people argued that any new school growth on the edge should be financed purely by developer impact fees, not by taxes imposed on the whole community.

Create Equity through Standards and Magnets

Participants suggested that this district needed to be far more thoughtful about offering choices to parents, particularly in the urban core. Developing centrally located, attractive magnet schools—rather than just building new schools ever farther out—might both slow sprawl and enhance equity for students in the core.

Use Year-Round Schools

Several argued that this district had done the right thing without really knowing it in setting up a year-round school calendar as a stopgap measure, and that it should resist parental pressure to go back to a nine-month calendar, which would entail building even more schools. One person took the thinking even further: Why not run two shifts of school throughout the day, accommodating the schedules and needs of parents who work at night? What design issues would a year-round, multishift school present in terms of creating personal spaces for teachers, students, and so forth.?

Vulcan

Vulcan School District

A shrinking, troubled school system in a midwestern Rust Belt city, Vulcan is on a state watchlist for academic performance and faces a state mandate to upgrade or replace a large number of inadequate, overcrowded school buildings. How can Vulcan make new partnerships with the state, the city, and local institutions to find resources and innovative solutions to cope with its problems?

The Vulcan scenario challenged participants by combining a citywide set of problems with lots of particular, tangled, school-level problems. But the groups, to their credit, took an attitude articulated by one participant: “Vulcan is pretty much of a mess, so that enables us to take a lot of risks.” The groups saw opportunities here to try an array of different experiments, keeping and expanding those that worked and discarding those that failed.

The groups also spent a lot of time talking about issues of community involvement and buy-in. Participants agreed that the community outreach needs to be sustained, not perfunctory, and should take advantage of technology (websites, email, newsgroups) to reach out to people and keep them informed. “You can’t just hold a meeting, expect people to show up magically, and when they don’t show up assume they don’t care,” one person said.



The groups, however, did not manage to come up with as aggressive and elaborated a concept of city-school partnership. But both groups were enthusiastic about the idea of offering neighborhoods shared-use agreements for school facilities in return for the mayor’s help on funding. One group, assuming the mayor’s priority was jobs, saw job training based in schools as a logical alliance.

Key Ideas

Create Smaller, but Busier Schools

Participants agreed that many of Vulcan’s schools, particularly the high schools, seemed too large. They were in favor of closing some and building smaller versions and trying to use community assets such as libraries and YMCAs to provide some facilities. Some of the larger buildings, they thought, could be renovated to house multiple programs that would operate inside the large buildings—magnet programs and the like. The groups also recommended that the very vocal preservation community should be enlisted to help the district get preservation tax credits or grants to preserve and renovate the older schools in this model.

Bust the Clusters; Build Communities of Choice

The groups saw Vulcan’s school cluster organization as a large impediment, reinforcing inequities and division based on income and class. While acknowledging that the idea would cause some tradeoffs with tradition, some student commutes, and some parental anxiety, they thought Vulcan would be better served by creating a menu of citywide magnet schools and charters with open enrollment. Instead of a school’s identity being based strictly on where it is located, it should be based on what it does for and with students. One group saw particular potential in downtown Vulcan’s empty buildings and proximity to cultural institutions. Why not, they said, create a “school village” on a downtown street—a blend of learning communities running K-12 schools that had significant partnerships and alliances with the downtown arts community and Vulcan’s higher education institutions.

Give It the Old College Try

The groups thought Vulcan’s colleges and cultural institutions, such as the Inventors Hall of Fame, should be enlisted as partners and even as the sites of new schools. This approach would allow Vulcan to close some of its larger and more dilapidated high schools. In addressing the particular problem of the large, failing Buchtel High, one group suggested that if enough of its students could be shifted to charters, magnets, or special schools at a place like the nearby Inventors Hall, then a new combined Buchtel-Central High could be built.

Don’t Throw Out the Civic Glue

Sports is a binding force in Vulcan but also a huge source of dilemmas, given that some of its oldest and most dilapidated school buildings are home to some of its most famous and beloved sport programs. The groups were keenly aware that these highly regarded sport programs that engendered so much community pride had to be factored into the new school construction plan. They believed that such massive change and reform could easily develop into a backlash of resistance and that every effort should be made to preserve schools’ sports identities, even in new buildings.

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The American Architectural Foundation (AAF) is a national nonprofit 501(c) (3) organization that educates individuals and communities about the power of architecture to transform lives and improve the places where we live, learn, work, and play. AAF's programs include The Mayors' Institute on City Design and *Great Schools by Design* - highly regarded initiatives that help improve the built environment through the collaboration of thought leaders, designers, and local communities. Through its outreach programs, grants, exhibitions, and educational resources, the American Architectural Foundation helps people become thoughtful and engaged stewards of the world around them.

www.archfoundation.org



KnowledgeWorks Foundation provides funding and leadership for education initiatives throughout Ohio. KnowledgeWorks Foundation believes that education is the key to the success of individuals and society. The Foundation is committed to furthering universal access to high-quality educational opportunities for all individuals. The Foundation believes that authentic community engagement will lead to school facilities that embody community values and are central to the life and learning of the entire community.

www.kwfdn.org

National Summit Sponsors



THE AMERICAN INSTITUTE
OF ARCHITECTS

American Institute of Architects (AIA)

Since 1857, the AIA has represented the professional interests of America's architects. Nearly 75,000 licensed architects, emerging professionals and allied partners express commitment to excellence in design and livability for the nation's buildings and communities. AIA members adhere to a code of ethics and professional conduct that assures the client, the public, and colleagues that AIA-member architects aspire to the highest standards in professional practice.

The AIA Committee on Architecture for Education (CAE) is a large and active group of architects and allied professionals concerned with the quality and design of all types of educational, cultural and recreational facilities. While a large portion of its members practice in the K-12 and higher education markets, with a primary focus on serving the needs of the entire pre-K to 99 markets

www.aia.org



Cisco Systems, Inc.

Cisco K-12 network solutions help achieve education excellence and administrative efficiency. Schools today require a reliable, scalable and highly available infrastructure as the foundation for all current and future system and network solutions. Cisco solutions for K-12 can help achieve real-time, enhanced communications; provide anytime, anywhere learning; and improve curriculum creation and delivery. Cisco's vision is to change the way people work, live, play and learn.

www.cisco.com/go/education

National Summit Partners



www.edfacilities.org

National Clearinghouse for Educational Facilities

National Clearinghouse for Educational Facilities

Created in 1997 by the U.S. Department of Education, the National Clearinghouse for Educational Facilities (NCEF) provides information on planning, designing, funding, building, improving, and maintaining safe, healthy, high performance schools.

www.edfacilities.org



PennPraxis, University of Pennsylvania

Founded in 2001, PennPraxis is the clinical consulting arm of the School of Design of the University of Pennsylvania, whose mission is to foster faculty and student collaboration on real world projects across the five disciplines of the school: architecture, landscape architecture, city and regional planning, historic preservation and fine arts. Modeled on the community design centers at other institutions, on legal services organizations in law schools, and the practice entities in medical schools, Praxis provides opportunities for student and faculty education and development, strengthens community ties, and provides service to the community.

www.design.upenn.edu/pennpraxis



The Center for School Study Councils, University of Pennsylvania

From its inception in 1943, the Center for School Study Councils of the University of Pennsylvania Graduate School of Education has worked to improve the quality of education in school districts across Pennsylvania and New Jersey. The Center for School Study Councils serves as a catalyst for school district superintendents to take a pro-active leadership role and facilitates their professional development.

The Center for School Study Councils is part of the Penn Center for Educational Leadership (PCEL). PCEL programs and services are designed to actively improve the instructional, organizational, and public leadership capacities of member school districts to deliver educational programs that enhance students' achievement and personal growth.

www.gse.upenn.edu/cssc

Alliance Partners

American Association of School Administrators

The American Association of School Administrators, founded in 1865, is the professional organization for more than 13,000 educational leaders across America and in many other countries. These school system leaders are responsible for improving the quality of districts' educational systems and often represent high-quality public education in general for the community. As leaders, together we can help shape the future of America through our commitment to democracy as a way of life. Our students form the fabric of America, its values, products, services, and growth. www.aasa.org

American Federation of Teachers

The American Federation of Teachers (AFT) represents 1.3 million pre-K through 12th grade teachers, paraprofessionals, and other school support employees, higher education faculty, nurses and other health care workers, and state and local government employees. The AFT was founded in 1916 to represent the economic, social, and professional interests of classroom teachers. It is an affiliated international union of the AFL-CIO. The AFT advocates sound, common sense, public education policies, including high academic and conduct standards for students and greater professionalism for teachers and school staff, excellence in public service through cooperative problem solving and workplace innovations, and high-quality health care provided by qualified professionals. www.aft.org

Council of Educational Facilities Planners International

The Council of Educational Facilities Planners International (CEFPI) is a professional association whose sole mission is improving the places where children learn. CEFPI members, individuals, institutions, and corporations are actively involved in planning, designing, building, equipping, and maintaining schools and colleges. The association serves its members through three key strategic areas:

- Advocacy and education of the general public, including policy makers, on the efficacy of school design and student outcomes by being a resource for planning effective educational facilities.
- Training and professional development of members and others through programs, workshops, seminars, and conferences promoting best practices in creative school planning.
- Research and dissemination of information regarding the link between the educational facility, its design, and student success.

www.cefpi.org

Council of the Great City Schools

The Council of the Great City Schools is a coalition of 66 of the nation's largest urban public school systems. Founded in 1956 and incorporated in 1961, the Council is located in Washington, D.C., where it works to promote urban education through legislation, research, media relations, instruction, management, technology, and other special projects designed to improve the quality of urban education. The Council serves as the national voice for urban educators, providing ways to share promising practices and address common concerns. www.cgcs.org

National Association of Elementary School Principals

The National Association of Elementary School Principals (NAESP) serves close to 30,000 elementary and middle school principals in the United States, Canada, and overseas. Its mission is to lead in advocacy and support for elementary and middle school principals and other education leaders in their commitment to all children. NAESP is the strongest unified voice for pre-K-8 leaders across the United States and around the world. NAESP was founded in 1921 by a visionary group of principals who sought to advance the profession. www.naesp.org

National Association of Secondary School Principals

The National Association of Secondary School Principals (NASSP) is the preeminent organization and the national voice for middle school and high school principals, assistant principals, and aspiring school leaders. It provides its members the professional resources to serve as visionary leaders. NASSP promotes the intellectual growth, academic achievement, character development, leadership development, and physical well-being of youth through its programs and student leadership services. NASSP sponsors the National Honor Society, National Junior Honor Society, and the National Association of Student Councils. www.principals.org

National Education Association

The National Education Association (NEA) is the nation's largest professional employee organization, representing more than 2.7 million elementary and secondary teachers, higher education faculty, education support professionals, school administrators, retired educators, and students preparing to become teachers. NEA has affiliate organizations in every state, as well as in more than 14,000 local communities across the United States. NEA has a long, proud history of advocating for its members, America's children, and public schools. NEA believes that every child in America, regardless of family income or place of residence, deserves a quality education. In pursuing its mission, NEA has determined that it will focus the energy and resources of its 2.7 million members on improving the quality of teaching, increasing student achievement, and making schools safer, better places to learn. www.nea.org

National Endowment for the Arts

The National Endowment for the Arts is a public agency dedicated to supporting excellence in the arts, both new and established; bringing the arts to all Americans; and providing leadership in arts education. Established by Congress in 1965 as an independent agency of the federal government, the Endowment is the nation's largest annual funder of the arts, bringing great art to all 50 states, including rural areas, inner cities, and military bases. www.nea.gov

National School Boards Association

The National School Boards Association (NSBA) is a not-for-profit federation of state associations of school boards across the United States. Our mission is to foster excellence and equity in public education through school board leadership. We achieve that mission by representing the school board perspective before federal government agencies and with national organizations that affect education, and by providing vital information and services to state associations of school boards and local school boards throughout the nation. Founded in 1940, NSBA through the Federation of State Associations now represents 95,000 local school board members, virtually all of whom are elected. These local officials govern 14,890 local school districts serving the nation's more than 47 million public school students. www.nsba.org

U.S. Conference of Mayors

The U.S. Conference of Mayors is the official nonpartisan organization of the nation's 1,183 U.S. cities with populations of 30,000 or more. Each city is represented in the Conference by its chief elected official, the mayor.

The primary roles of the Conference of Mayors are to

- Promote the development of effective national urban/suburban policy
- Strengthen federal-city relationships
- Ensure that federal policy meets urban needs
- Provide mayors with leadership and management tools
- Create a forum in which mayors can share ideas and information

The Conference has historically assumed a national leadership role, calling early attention to serious urban problems and pressing successfully for solutions. www.usmayors.org



**National Summit on School Design
Acknowledgements**



The American Architectural Foundation is grateful for the generous support and commitment of its *Great Schools by Design* sponsors and partners. They share our commitment to helping improve the quality of America's schools by promoting good design, increased collaboration in the design process, and more information sharing among schools, designers, and community stakeholders.



McGraw-Hill Construction and Herman Miller, Inc. are founding co-sponsors of AAF's *Great Schools by Design* program.



KnowledgeWorks Foundation was a co-convenor of the National Summit on School Design and co-funds components of *Great Schools by Design* with AAF.

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Your Feedback Matters

Please take a minute to let us know your thoughts on the National Summit on School Design report. We'd like to hear what you think. Send us an email at: feedback@archfoundation.org.

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