THE WHOLE-SCHOOL SUSTAINABILITY FRAMEWORK

Guiding Principles for Integrating Sustainability Into All Aspects of a School Organization

Stephanie K. Barr, Jennifer E. Cross, & Brian H. Dunbar
Institute for the Built Environment • Colorado State University

THE CENTER FOR GREEN SCHOOLS

Foreword

At the Center for Green Schools at USGBC, our mission is to make sure every child attends a green school within this generation. We believe that all students deserve the opportunity to be educated in healthy environments that are conducive to learning and support their dreams for a brighter future. That's why we are leading a movement to improve the health, safety and efficiency of our schools. In 2013, our resources, tools and research publications reached more than 35,000 individuals. We provided hands-on training to more than 2,000 school advocates and staff who champion green school improvements and serve the 18 million PreK-12 students who already learn in schools that have green building policies. Our vast network of green schools volunteers dedicated over 1.1 million hours of service in 2013 to their communities in support of healthy, high-performing schools for students and teachers.

In 2011, the U.S. Department of Education launched the Green Ribbon Schools award program—a monumental step forward for the green schools movement. The Center for Green Schools at USGBC worked closely with the Department to develop award criteria that would be comprehensive, inclusive and help the thousands of passionate educators, volunteers and advocates working toward healthy and efficient school environments to drive transformation. The award application asks schools to demonstrate their progress toward three aspirational goals: zero environmental footprint (including energy, water, waste and carbon), a positive impact on occupant health and performance, and 100% of graduates demonstrating environmental literacy. The three pillars—environmental impact, human health and ecoliteracy—act as a simple, elegant organizing principle for schools journeying toward whole-school sustainability.

The Green Ribbon Schools criteria help schools to understand where they should end up. But what will it take to get there? Not surprisingly, a whole-system approach to sustainability requires individuals from across an organization to work together. Successfully advancing whole-school sustainability requires districts to not only shift practices and policies but also culture. School staff, faculty, students, parents and leadership must create the conditions necessary to journey toward sustainability across all three pillars set forth in the Green Ribbon Schools criteria.

We are thrilled to collaborate with the Institute for the Built Environment at Colorado State University (CSU) to present to you a guiding framework that articulates the conditions and approach to advance successful whole-school sustainability efforts. Through years of focused study, the team at CSU has developed a research-based framework that supports lasting cultural shifts toward healthier, greener schools. Where the Green Ribbon Schools criteria guide and inform a school's roadmap toward sustainability, it is our hope that the Whole-School Sustainability framework will serve as the compass to stay the course.

With this publication, our intent is not to introduce a new rating system or criteria for green schools, but rather to introduce a framework to complement, inform and enhance ongoing efforts. We hope its inspirational stories and clear guidance will support you and your own efforts to make sure all of our children attend schools that are healthy, safe and efficient and inspire great learning. And, if you're reading this, we're confident that you agree with us that every child deserves such an opportunity. **Where we learn matters.**

Rachel Gutter
Director
The Center for Green Schools
at the U.S. Green Building Council

Acknowledgments

Thank you to the schools featured in our case studies and the educators, professionals, and students who shared their stories.

Debrah Hall, Head of School
Monarch School, Houston, TX

Stu Reeve, CEM, District Energy Manager
Mike Spearnak, AIA, CEFPI
Director of Planning, Design, & Construction
Poudre School District, Fort Collins, CO

Tom Lopez, Principal
Dave Swartz, Teacher, Environmental Science
Rocky Mountain High School, Fort Collins, CO

Mark Lam, Ph.D., AIA, K-12 Practice Director
SHW Group

Shelly Pottorf, AIA, LEED AP BD+C, Principal Architect
Architend

Leslie Thomas, Principal
Rosa Parks Elementary, Lexington, KY

Dina Sorensen, LEED AP BD+C, Project Designer
VMDO Architects

Dan Schnitzer, Director of Sustainability & Operations
Academy for Global Citizenship, Chicago, IL

Chuck Puga, Principal
Carey Kalisch, Building Engineer
Ponderosa High School, Parker, CO

Farah Wissinger, Center for Green Schools UTC Fellow
Sacramento City Unified School District

Authors

Lead Authors

Stephanie K. Barr, M.S., LEED AP BD+C
Research Associate, Institute for the Built Environment at Colorado State University

Jennifer E. Cross, Ph.D.
Director of Research, Institute for the Built Environment, Associate Professor, Department of Sociology, Colorado State University

Brian H. Dunbar, M.Arch, LEED Fellow
Executive Director, Institute for the Built Environment at Colorado State University

Case Study Authors

Anisa Baldwin Metzger, M. Arch, LEED AP BD+C, O+M
Center for Green Schools at USGBC

Stephanie K. Barr, M.S., LEED AP BD+C
Research Associate, Institute for the Built Environment at Colorado State University

Jennifer E. Cross, Ph.D.
Director of Research, Institute for the Built Environment, Associate Professor, Department of Sociology, Colorado State University

Becky Moriarty
Sustainable Building Associate, Institute for the Built Environment at Colorado State University

Copyright © 2014 Center for Green Schools at USGBC

Table of Contents

Introduction 1

Organizational Culture 4

Vision & Mission Alignment 5
Interdepartmental Learning 6
Catalytic Communication 7

Physical Place 8

Engaging & Active Design 9
Progressive Efficiency 10
Healthy Systems 11

Educational Program 12

Charismatic Leadership 13
Connection to Place 14
Student Powered 15

Works Cited 17

Introduction

Several years ago, the Institute for the Built Environment at Colorado State University was involved in the planning of green school projects in and around our community of Fort Collins. We saw the potential for these buildings to be more than healthy, high-performing facilities; we saw that they held the capacity to teach students and community members about sustainability. Through the design, construction, and operations of these schools, we realized that not only is an educational component beneficial, it is imperative to the long-term sustainable operations of green school buildings and grounds. We saw that even the noblest of green building design intentions can be lost if sustainability is not integrated into the facility's operational practices and educational program.

Therein lies a problem, however. In order for sustainability to be integrated into a school's long-term operational and educational practices, organizational change is required. Organizational change (accepting a new vision for the organization, establishing new practices and policies, changing responsibilities and roles of members, etc.) is incredibly difficult. We have witnessed countless schools and districts struggle to integrate sustainability into their facilities, programs, and organizational culture. However, we have discovered pockets of success, schools and districts that overcame the barriers to advance whole-system sustainability. We researched these cases in order to answer a critical question—**What are the key principles of integrating sustainability into all aspects of a school organization?**

This report presents the results of our case study research. The principles presented here are intended to illustrate the integrated approach that allows schools and school districts to create the conditions necessary to journey toward whole-school sustainability across all three pillars set forth by the U.S. Department of Education in the Green Ribbon Schools criteria.

About the Whole-School Sustainability Framework

The framework is founded on the imperative that in order to be successful, sustainability requires a whole-system approach. A Whole-School Sustainability approach requires individuals from across an organization to work together—it cannot be accomplished in a silo. This system framework is organized into the three components of schools: organizational culture, physical place, and educational program. Within these three components, we have identified a total of nine principles.

This report defines each principle and utilizes literature from across the disciplines of social science, business, education, and building science to illustrate how each principle manifests in a school and why it is critical to success. To further illustrate each principle, we have included a short case study on a school or district that exemplifies the principle. Though we present just one aspect of a school or district in each case study, we believe each is practicing whole-school sustainability.

HISTORY OF "WHOLE-SCHOOL"

In 2004, an Australian research team conducted an international review of school sustainability programs, defining the strategies and scope of existing programs. Their report concluded that whole-school approaches to sustainability were vital to move toward sustainable communities. This review was the first to define school sustainability at an organizational level, beyond singular aspects of building design or curriculum. It set a foundation and illustrated the necessity of making schools laboratories for sustainability. [1]

Healthy Systems
Charismatic Champions
Progressive Efficiency
Connection to Place
Physical Place
Educational Program
Sustainability
Engaging & Active Design
Student Powered
Organizational Culture
Catalytic Communication
Vision & Mission Alignment
Interdepartmental Learning

Photo credit: Tom Daly for VMDO Architects

Organizational Culture

Organizational culture includes the shared values, social norms, and practices within an organization. Establishing sustainability programs and behaviors in a school requires aligning organizational culture with a vision for sustainability. To successfully integrate sustainability as a core component of organizational culture, it must align with the organization's established mission, be supported by interdepartmental collaboration, and be communicated effectively.

Vision & Mission Alignment

A vision is what grounds an organization and allows it to gain momentum and collectively move in the same direction. A list of do's and don'ts will not inspire change, whereas an inspiring vision for the future can engage a community of people and provide a sense of purpose.

The vision uniquely reflects the school community.

A thoughtful vision statement should be created by members of an organization and reflect their educational mission, values, priorities, and culture. It should be easy for all stakeholders (including students) to understand and relate to the vision. By collaboratively developing the vision internally, stakeholders will be invested in it and engaged in seeing that it is accomplished. [2-4]

The vision defines an inspiring image of the future.

Schools are naturally future-focused. At their core, schools prepare youth to be knowledgeable, active citizens. In order to prepare students to lead a sustainable future, we must first believe that a sustainable future is indeed possible. Successful schools inspire stakeholders by describing a positive end-state, instead of describing problems that should be fixed. This focus on a positive future also communicates a positive way of life: "this is our culture, this is the way we 'do life' in this place". [1, 2, 5]

Ambitious & achievable goals are defined.

To bring the vision to an actionable level, school stakeholders define clear goals. These goals are ambitious, requiring the full investment of stakeholders, but are still achievable. Further, they establish a sense of urgency by communicating that our actions today are critically important and have a lasting impact on the future of our school, community, and planet. [4]

THE MONARCH SCHOOL

HOUSTON, TX

Integrating Mission & Stewardship

Everything about The Monarch School is different, but not for the reasons one might assume. This thoughtfully planned school for students with neurological differences sets an example of intentionality in academic and spatial design that schools everywhere can learn from. The school forms individual learning plans for each student that touch four core goals: self-regulation and self-awareness, executive functions, relationship development, and academic and professional competence. As the Head of School, Debrah Hall, notes, "We're looking for students to grow in these four core areas—actually, every human should—and we want them to be contributing members of society. There's simply no way to do this without being connected to and responsible towards the environment."

When it came time to plan a main building for incoming students, school leaders chose a design team at Jackson & Ryan Architects that would come to deeply understand the vision and mission of the school. As architect Shelly Pottorf recalls, "Systems thinking in this school was integral to the way they were working with students, approaching students' developmental needs from different angles and with various methods and working with the individual as a unique piece of a whole system." To Pottorf, the school's systems approach was an obvious fit with the essential intentions of ecologically responsible design. The building was designed using an intense integrated design process, with architects returning to the school community every two weeks for several months to come up with the right solution for students and staff.

According to Hall, students with neurological differences need interaction with the environment in a variety of ways, and one very powerful interaction is that of stewardship. Through guided interaction with the building, students begin to feel ownership over the curriculum, and they begin to feel pride through this ownership. This pride is contagious to staff, parents, and the entire city. "It's not something we do," Hall says. "It's something we live."

Students celebrate Earth Day with posters and guided tours of their building. Photo credit: The Monarch School

Interdepartmental Learning

Sustainability requires a systems-based approach; therefore, a whole-school sustainability program cannot be implemented without reaching across disciplines and departments. Educators, administrators, building managers, students, and community members must be included in any sustainability initiative. Broad-based, positive change is only possible when people interact across departments, roles, and schools.

Cross-cutting teams are established.

Successful schools and districts establish teams of individuals from across departments, providing a place for synergy, sharing, co-learning, capacity-building, and innovation. This team approach generates shared ownership, personal responsibility, and commitment. When teams increase connection and interaction across groups (known as an interconnected and distributed social network [6]), they are resilient to change and less likely be derailed by inevitable changes in leadership. In addition, engaging with outside organizations builds internal staff capacity, expands technical expertise, and aligns the program to the needs of the local community. [1, 3, 4, 6]

Sustainability is integrated into all staff roles.

Instead of making sustainability an add-on, award-winning schools have made sustainability a core aspect of all tasks and roles. The expertise of each staff member is capitalized on through an organizational environment that encourages and expects idea sharing, innovation, and continuous improvement. [3, 4, 6]

Continuous development & evaluation is part of the learning process.

Schools that are leaders in sustainability maintain a sense of urgency by establishing processes for continuous improvement. They question the status quo by monitoring and evaluating practices. Feedback loops (in the form of data reporting, standing meetings, forums, or surveys) encourage learning and ongoing evolution of the program. [1, 7, 8]

THE POUDRE SCHOOL DISTRICT GREEN TEAM

Leading Sustainability by Capitalizing on Interdepartmental Learning

In 2000, when preparing to build several new schools, Poudre School District (PSD) established a Green Team, including staff from across facilities departments. When asked why the Green Team was formed, district architect Mike Spearnak shared, "When we got started, we formed the Green Team because I couldn't possibly do it all by myself, and we wanted to give a voice to the people who live in and take care of these schools long after the design professionals have moved on." Each member brought forth innovative ideas and discussed how to build more sustainable buildings. This work culminated in the development of the district's Sustainable Design Guidelines.

During the design and construction of the district's first green schools, outside agencies encouraged the district to set more ambitious goals and provided resources to help the district. For instance, Fort Collins Utilities encouraged PSD to set loftier goals for energy conservation than the district thought possible, and they also provided the district with Energy Rules, a science unit that they brought into elementary and middle school classrooms. Stu Reeve, Energy Manager at Poudre School District, expressed the value of their interdisciplinary team by saying, "Everyone helped us. We learned from them, and they learned from us."

The district learned that their goals for sustainability were best achieved when initiatives were implemented by cross-cutting teams. For example, in 2012, the district began a new milk carton recycling program.[8] The Resource Manager coordinated with custodians and cafeteria staff as well as teachers and students to ensure that cartons were disposed of according to the waste collector's detailed requirements. Reflecting on the Green Team, one staff member commented, "We came together as one team and said, 'What can we do right?' And then after every building we built, we evaluated it and asked, 'How can we do it even better?'"

Detailed signage and instructions by students and members of the district Green Team have led to increased waste diversion in Poudre School District's schools. Photo credit: Center for Green Schools

Catalytic Communication

Communication is the primary tool for inspiring change, sharing the vision, prompting new behaviors, and recognizing accomplishments. Any effort to create change requires communication through a variety of channels with a clear and consistent message.

Desired change is clearly defined & tangible.

Changing behavior is most successful when the behavior expectation is communicated simply, clearly, and through a variety of channels, such as personal interactions, email, newsletters, announcements, posters, assemblies, and social media. The messages should define the desired behavior (e.g. turning out the lights) and use language that is meaningful, tangible, and reflects school values, culture, and social norms. [9, 10]

The vision is communicated through both language & action.

Demonstrating the vision through action is as important as communicating it with words. Once a school adopts sustainability as a vision, students and teachers will see and suggest new opportunities for sustainability. People learn how to conduct themselves by watching the behaviors of others. Everyone in a school, especially leaders, communicates the vision through their actions; they walk the talk by modeling the behaviors they desire to see. When actions accurately reflect the vision, change efforts are more successful. [4, 11, 12]

Comparative feedback is provided.

Social norms are one of the greatest and least recognized predictors of our behavior. If our peers or neighbors are conducting themselves in a certain way, then we are more likely to conduct ourselves in the same way. For instance, competitions between schools, classrooms, or individuals are motivating because they establish social norms by communicating and comparing the behavior of peers. Comparative feedback is especially motivating when teachers, students, or entire schools are accustomed to competing against each other. [13, 14]

ROCKY MOUNTAIN HIGH SCHOOL
FORT COLLINS, CO

Utilizing Catalytic Communication to Achieve Record Electricity Conservation

In the mid-1990s, in an effort to engage schools in reducing their energy use, the Poudre School District began publicizing each school's use compared to its peers and offering rebates to those who lowered their use. Among the district's high schools, Fossil Ridge (the district's new LEED certified high school) was the most efficient; however, the staff and students at Rocky Mountain High School (built in 1971) decided they were not going to allow their rivals to claim the title of "most energy efficient" without some competition.

To engage teachers and students in conservation, science teacher Dave Swartz and his students used regular reports of resource use and reported on their progress through a variety of channels, including emails, student-written announcements, posters, and newsletters. Students and teachers communicated using language that would be meaningful and make sense to their peers.

Rocky's leadership and staff also modeled the vision. The principal, Tom Lopez, tied their conservation goals to the school's code of conduct, The Lobo Way, and created a conservation ethic called "Care and Repair." Another important leader was the custodian at Rocky. He modeled the school's commitment to conservation by altering the routines of custodians, reducing the hours the building was fully lit each day and delamping in hallways that were over-lit.

These strategies proved more successful than anyone could have anticipated. By 2007, Rocky had reduced its energy consumption by 50%, due in majority to the conservation efforts of building occupants.[13] The district annually awards rebates to schools that reduced their energy consumption, and these funds are spent at each school's discretion. The students at Rocky used these funds to purchase wind power for their school for one month a year as part of their Earth Day activities.

Students in the Environmental Club at Rocky coordinate recycling at the school. Photo credit: Dave Swartz

Physical Place

A school's physical place—including the built environment, surrounding natural environment, and the resources that flow through the school—provides both the context for an educational experience and a visible representation of school values. To best harness the power of physical place, it must be engaging and active, be progressively more efficient, and embody systems that enhance human, environmental, and economic health.

Engaging & Active Design

A school's built and natural environment provides immense opportunities for students to learn about sustainability, science, technology, conservation, the history of their community, and more. A building can be an intentional teaching tool by engaging student curiosity through thoughtful design and utilization by educators. Through this interaction, the school's physical place becomes a key component of the sustainability vision.

School building & site invite exploration.

In order to invite exploration, the building and site should be multi-sensory, accessible, and beautiful. Students should see and touch the systems that make the place sustainable. Further, students should be able to access systems' inner workings, manipulate their function, and monitor their impact on conservation goals. Finally, the beauty of the place reminds students that learning is important and that their community values learning and provides a beautiful place for them to learn. [15-18]

Flows & impacts are illustrated.

Buildings are much like a biological system. Nutrients like energy, water, air, and food flow into the building and support its function, then flow out in the form of waste and heat. Students should visibly see these flows in order to understand system dynamics and identify their own role in reducing the amount of waste produced by their school. In many cases, building design and operations can visibly close the loop on these flows (such as through the use of cafeteria compost in a school garden). [15-17]

Building & site provide intentional teaching tools.

The most interactive green buildings are designed with sustainability education in mind and provide tools for hands-on, project-based learning. Educators should play a vital role in the design of the tools and should be coached to utilize them as an integrated component of their classroom objectives. [15-19]

GLORIA MARSHALL ELEMENTARY SCHOOL
SPRING, TX

Designing for Curiosity and Fun

Originally, Gloria Marshall Elementary School was slated to be a repeat design of schools already built in the Spring Independent School District. Instead, the design team chose to pursue a more sustainable and efficient avenue. From the beginning, the team's goal was to make sure the building's sustainability features were not a lost opportunity for student learning, so they involved the teachers, students, and administration early in the design process.

To begin, designers and school leaders focused on simply getting the kids to want to be at school. According to Mark Lam, the project principal from SHW Architects, "We asked ourselves, 'How do we, as architects, try to help entice kids to actively engage?' So making the building attractive, appealing, intriguing, and inviting were the goals we had for getting the kids to want to be there." Students now walk past an eco-pond, a windmill, and an above-ground cistern as they enter the new facility. As described by Lam, "When students walk through the entry courtyard into the main foyer, they will see a giant elevator that can fit an entire class of students, a slide, a tree house, a hang glider swooping overhead, and they know: this is going to be fun!"

The design team made the sustainable features visible for the school and provided ways for students to engage with or manipulate the features. Students can view the rainwater being captured in the cistern and help regulate the water level of the eco-pond. The Discovery Center allows students to monitor the energy and water use of the building. Life-size thermometers, world maps with time zones, worm boxes, and sundials all can be operated by students.

Early on, the team realized that, though these features are interesting and beautiful, they wouldn't impact learning unless they were integrated into curriculum. The district and the design team collaborated to develop a discovery-based curriculum, which is actively engaging kids in their place.

Teachers lead students in actively engaging with the school and its surrounding environment. Photo credit: SHW Group

Progressive Efficiency

An inspiring vision for the future requires practices that are progressively more efficient in order to meet ambitious and achievable objectives. This commitment requires organizations to communicate their progress to the public, establish conservation behavior, and institutionalize progressive efficiency into policies and procedures.

Progress is made public.

By making efficiency goals and annual reduction targets public, the organization has a greater sense of accountability and motivation. Publicizing goals and results also invites the community to follow progress and learn from successes and failures, further positioning the school as a hub for community learning. Measuring and reporting success is also a key tool for progress. By measuring, a district can more easily identify problems and opportunities for greater efficiency. [4, 12]

Conservation behavior is a social norm.

Conservation is not just a duty of facility managers. All building occupants have a role and responsibility to play in progressively improving the efficiency of a school. Desired conservation behaviors should be clearly communicated, barriers should be removed, and the positive impact should be reported back to occupants. The end goal is for sustainable behaviors to become a social norm, a universally understood behavior expectation for school occupants. [10, 12]

Policies institutionalize progressive efficiency.

For organizations just starting to implement sustainability initiatives, progress can be quickly reverted if key champions leave the organization. To keep the sustainability initiative "sustainable," it must be institutionalized. Creating sustainable design guidelines, operations and maintenance guidelines, sustainability management systems, etc., to institutionalize practices and policies can help schools to stay the course. [4, 12]

ROSA PARKS ELEMENTARY
LEXINGTON, KY

Progressive Efficiency Takes Root

Leslie Thomas had been principal of Rosa Parks Elementary for nine years before the district hired a new energy manager through a state energy program. That same year, in 2009, she and her staff started getting serious about environmental education. During a chance conversation with the district's Director of Operations, Thomas learned that the district wanted to do a pilot project with a school to determine the extent to which energy savings could be achieved through low-cost measures and shifts in occupant behavior. She jumped at the opportunity.

For the first year of their energy efficiency pilot, the fourth grade student team set a goal of $10,000 savings. The entire school community participated, everyone wanting to see if this achievement was possible. The students did energy walk-throughs, teachers held class using only daylight, facilities staff de-lamped one bulb per classroom, changed set-points of mechanical equipment, and so on. At the end of the year, the school was shocked to find out that they had saved $50,000—five times their goal.

Since 2009, these successful energy efficiency efforts have spawned environmental awareness that now permeates the character of the whole school. "We were wondering how we were going to keep this going—how we were going to keep getting better—but the kids just keep coming up with new things," Thomas says. The school continues to raise the bar on its energy and recycling goals with the help of new progress reports from the district; and students and staff have initiated a no-idling policy, created a mural with a local artist, and fundraised for garden projects. The school's achievements around energy efficiency are announced at school assemblies and PTA meetings. Parents, teachers, community organizations, and volunteers have formed a sustainability committee to report and make new recommendations to the school's decision-making committee. "It has spun off in so many ways," Thomas muses. "It affects everything we do at the school. It's the way we talk about having a positive effect in the world."

Students pose with the mural they painted at the school with the help of a local artist. Photo credit: Rosa Parks Elementary

Healthy Systems

A healthy system is one that balances environmental, social, and economic concerns. In schools, an infinite number of complex, integrated operating systems exist—from procurement and food service to cleaning and air quality management. Though metrics and guidelines exist to guide operational practices, school operations will be healthy only if the purpose, priorities, and operational practices are focused on health.

Operations are guided by a larger purpose.

Successful schools understand that the overriding purpose of school operations is not to stay on time and on budget—it is to create a healthy environment for students that is conducive to learning. If this is the core purpose of school operations, healthy and sustainable practices will follow. Though school operations are a complex system and difficult to change, theories of system dynamics tell us that, even if every element within the system stays the same (i.e. people, budget, equipment), changing the *purpose* of the system will result in profound change. Purpose is the most crucial determinant of a system's behavior. [7, 20]

Human, environmental, & economic priorities are synergistic, not in competition.

Building operators know that an efficient building must also be a comfortable building. Yet it is not always easy to consider human and environmental impacts while also attempting to balance costs. However, expanding decision-making processes to consider both the budget and impacts on student and environmental health results in healthier—and, more often than not, more efficient—school operations. This shift requires instituting an integrated process, questioning the status quo, and finding creative, innovative solutions that meet sustainability's triple bottom line. [6, 7]

Healthy lifestyles are bolstered by school operations.

The operational practices of schools often make healthy choices difficult. In order to make health the path of least resistance, school operations should utilize strategies like proximity and accessibility, capitalize on default behavior, and provide incentives and feedback. Placing fresh-cut fruits and veggies in closer proximity to students than unhealthy snacks or creating accessible and safe bike routes to school are both examples of shifting school operations to reinforce health. [17, 18, 21]

BUCKINGHAM ELEMENTARY
DILWYN, VA

Designing Healthy Lifestyles

Despite being surrounded by farms and vast open space in rural Virginia, the Dillwyn community lacks access to local foods and public parks. After reviewing the county health report, the design team for Buckingham County Primary and Elementary Schools realized that these factors were weighing down the community, literally. With high obesity rates plaguing the community, the team at VMDO Architects decided to directly address the problem in the design of the new elementary school. They wanted the site to not only be an innovative educational landscape for the 1000 K-5 students, but also to be utilized to showcase healthy, sustainable lifestyles and catalyze a community-wide health initiative.

The school and design team expanded their definition of health beyond healthy building materials to include community amenities, operations, and public access to the site. According to Dina Sorensen, Project Designer, "Our green school approach is healthy anyways, but this went much deeper." Attention to proximity and access to outdoor space resulted in multiple gardens and outdoor classrooms, all of which are visible from the interior school building.

Additionally, the team partnered with health industry professionals and academic researchers to create and implement design guidelines that promote healthy living through "choice architecture." This type of architecture seeks to "nudge" children to make healthy choices, whether deciding between vegetables or carbohydrates or choosing which seat to take in class. Sorensen notes, "Students still get to make the choice, but no matter what they choose, it's a healthy choice." The team even went so far as to procure furniture that allowed the students to move. Since kids are constantly in motion, the team wanted to provide multiple options for sitting, standing, even wiggling. Sorensen believes that Buckingham's success lies in the fact that "it speaks to the kinetic energy of kids and their creative intelligence."

Active design elements allow students to explore physically while they learn. Photo credit: Tom Daly for VMDO

Educational Program

Connecting people, place, and purpose, a school's educational program brings the vision and mission of a school to life. If the school's vision for sustainability is aligned with its core education mission, then sustainability will be visible in the educational program through the leadership of staff, place-based connections, and the activities of students.

Charismatic Champions

In schools, both formal and informal leaders have key roles to play in motivating change. Charismatic champions gain their authority and ability to influence others through their personal devotion to sustainability. Anyone in a school—students, custodians, teachers, and principals—has the potential to be a charismatic champion when they share their passion to inspire and empower others to change.

Formal leadership supports the vision.

Formal leaders, like principals and superintendents, support change efforts by communicating the vision and demonstrating their commitment. Formal leaders might not be the foremost sustainability champion or expert in the school, but they must support change by communicating the vision and supporting the change makers. [4, 11, 12, 22]

Leaders are empowered at all levels.

The schools that have made the biggest changes have had multiple charismatic champions in all levels of the organization. They benefit from having custodians, students, teachers, building engineers, and administrators encourage changes in behavior. Often, the most impactful changes come from people in unexpected places within the organization. These charismatic champions are committed to the school's vision for sustainability, share their knowledge and passion with others, and guide change efforts. [4, 11, 12, 22]

Decision-making is transparent & empowering.

The greatest potential for change is realized when students, teachers, and staff (including custodians, cafeteria staff, building operators, receptionists, and others) are included in decision-making. Each should be empowered and granted the authority to make decisions, and each should be provided with the resources necessary to implement these decisions. [4, 12, 22]

PONDEROSA HIGH SCHOOL
PARKER, CO

Leading a Culture of Conservation

Ponderosa High School has become a leader in the Douglas County School District for energy conservation and sustainability. Within the school, many people have been identified as charismatic leaders: the principal, the building engineer, students, and the student group sponsor—a front office assistant.

Teachers, students, and staff identify the principal, Chuck Puga, as a charismatic leader because he consistently demonstrates his personal commitment to conservation in the school. Principal Puga announces sustainability goals and progress in faculty meetings, telling staff, "Our August energy usage is up...Guys remember this is a competition between high schools, and I'm very competitive. So we're going to win, and that's the bottom line!" He also talks to teachers and staff personally about their individual behavior, and he celebrates the school's success publicly.

The building engineer, Carey Kalisch, is an innovator and a champion for change across the entire district. For the past several years, he has been encouraging even the most resistant teachers and staff. Carey's passion for energy conservation is clear. "We're always challenging ourselves to see how much energy we can save year to year," he says. He has also helped to change job descriptions in the district to include energy conservation and management in every building engineer's responsibilities.

Students are described by many in Douglas County Schools as playing a key role in encouraging and reinforcing new behaviors. One teacher describes how students encouraged him to recycle by telling this story: "I had one student in my class, and if I put this in the trash can she would come over and yell, 'Mr. Weller!' and she'd put it in the recycle bin. So after a while I was like, 'Alright I'm going to put it in the right place because I don't want her to yell at me!' So, I think that the kids taking it on was important."

Passionate leaders set the tone for students and faculty. Pictured: Chuck Puga, Principal; Debbie Ruiz, PeaceJam Club Sponsor; Carey Kalisch, Building Engineer. Photo credit: Ponderosa High School

Connection to Place

"Place" includes the physical and natural environment, as well as the history and culture of the surrounding community. Connecting students to their place strengthens the relationship between the school and its community and helps students to understand complex, global issues by engaging at a local level.

Immediate resources & tools are utilized.

Issues like climate change and environmental degradation are often so large and distant that students can feel hopeless, disempowered, and fearful. Utilizing immediate resources, such as the school building, grounds, and community, allows the opportunity for hands-on, project-based learning. These projects can contribute to the broader sustainability efforts of the school or community and can help students develop a sense of efficacy—the feeling that their efforts make a difference. Through these experiences, students are better able to grasp principles of sustainability through guided questioning, reflection, and application. [1, 23]

Principles of sustainability are woven across curriculum.

The schools achieving awards for sustainability like the Green Ribbon Schools designation are connecting sustainability to the curriculum. Principles of sustainability (e.g. cycles, social justice, respect for limits, systems thinking, local and global citizenship, interconnectedness, the commons, etc.) are woven across existing curriculum, instead of being viewed as an add-on or applicable only to science curriculum. [1, 24-26]

The school is utilized as a hub for community learning.

In schools that are truly connecting students to their physical and cultural environment, students share what they are learning with the community by giving tours, through multi-media, or by working with other groups to replicate their successful projects. The school becomes a place where students, teachers, and community members can learn together. This type of sharing increases connections between the school and the community and enhances school identity. [1, 24]

THE ACADEMY FOR GLOBAL CITIZENSHIP
CHICAGO, IL

Connecting to and Investing in Chicago

Located on the underserved southwest side of Chicago, the Academy for Global Citizenship (AGC) is taking the initiative to create mindful leaders in the community. AGC seeks to teach its students about many different types of community and place: philosophical, school, neighborhood, city, state, even global. As explained by Dan Schnitzer, AGC's Director of Sustainability, "Philosophically, we see the role of the school is to provide for the community, both in terms of education now but also in the future, by our students understanding their neighborhoods and communities and giving back to them."

The school recognizes that students need to understand where they are in their own communities before they can understand the bigger, global community. The building itself is used as part of the curriculum: students can check online for the energy saved by the building's solar panels, use the gardens to learn about food production, or look around the boiler room to see how the building operates. Furthermore, all employees of the school, from the head of maintenance to the kitchen staff, take part in the learning process. Schnitzer reports, "Everyone in school has a role with the education . . . there's always an expectation that part of place are the people that make up that place and that we are all educators in our [own] way and have something to offer."

Once outside the gates of campus, the school makes a concerted effort to be involved in the local community. Field trips to Midway Airport, presentations by local doctors and financial advisors, participation in local farmer's markets, and walking classes in the neighborhood allow students to get to know the available resources that surround them. Schnitzer offers this suggestion for other schools: "Always look at [local amenities] as assets until proven otherwise. Ask: What does that have to offer? How can it be utilized? How can it help our purpose? How can it serve our mission?"

Gardens on school grounds give AGC's students hands-on experience with nature and their community. Photo credit: The Academy for Global Citizenship

Student Powered

Placing students at the center of a sustainability program is critical to the program's long-term success and the cultivation of a generation of sustainability leaders. Students have an endless supply of energy, ideas, and enthusiasm; and successful schools harness this invaluable, renewable resource.

Students are empowered to make positive change.

In schools that are sustainability leaders, students are engaged in leading sustainability projects and initiatives in their school. They are encouraged to research and develop new solutions and collaborate with appropriate faculty and staff, and they are granted the authority to implement their ideas. Further, students inform administrative-level activities by sitting on district sustainability teams or new school planning committees, voicing their opinions alongside their teachers and principals. [11, 12, 27]

Students are peer mentors.

The success of a program cannot be dependent upon a single teacher or staff member. Instead, students should be empowered to sustain initiatives. Upperclassmen should be established as peer mentors who model behavior and teach younger students. Other students see that they hold a position of honor, one which will be handed down to the next year's leaders. Finally, these peer mentors can become peer ambassadors to replicate successful initiatives in other district schools. [11, 12]

Students are prepared for active citizenship.

As students develop an understanding of their role and responsibility in the sustainability of their school, they also learn their role and responsibility as citizens of their community and the earth. Environmental and social concerns within their community should be explored, encouraging students to participate in projects that serve community needs. [24]

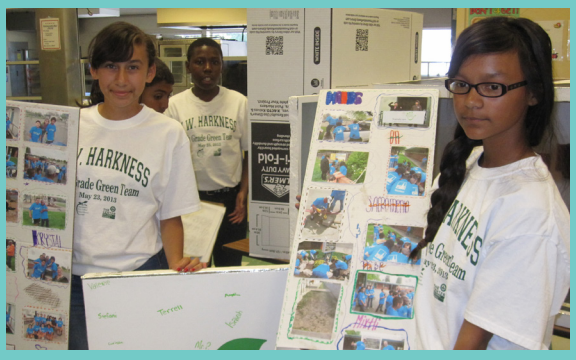
SACRAMENTO CITY UNIFIED SCHOOL DISTRICT

Empowering Students Through Project Green

Sacramento City Unified School District (SCUSD) kicked off Project Green in 2011, an effort aimed to bring community participation into facilities decisions. Using reallocated funds and more recent bond funding, the school board called for school improvements that would be based on student suggestions. The inaugural fifteen student teams were guided by their teachers and by the district's Center for Green Schools UTC Fellow, Farah Wissinger, through an in-depth green audit of their school. Students researched the most impactful solutions and educated each other about what could be done at their school. For these teams, Wissinger says, "It's no longer just a school building. It's a system; it's a place they can investigate. When the district talks about energy efficiency, they know what that means, and they can feel like they're part of the solution."

Teams presented to a panel of community experts in the spring, showing off calculations for water piping, investigations into climate-specific vegetation, scientific research into the effects of daylight on the body, cost projections, and more. Judges were blown away—and so was the SCUSD Superintendent, Jonathan Raymond. What had started as a project to get community involvement in school improvements had ended up aligning perfectly with state standards and learning expectations.

Many of the teams maintained their enthusiasm. One of the top student teams, from Rosemont High School, didn't stop at the award ceremony. They began checking in on their project, emailing with the district's electrical shop to talk about the project and learn about the process. The interaction with the students—though demanding—is energizing for staff, and it is shifting the paradigm of facilities work in the district. As students begin to understand the district sustainability goals at a site-specific level, the district department heads, in turn, learn more about what it means to be a sustainable district from the students.



Students present their projects to a panel of judges in the first annual Project Green program. Photo credit: Farah Wissinger

Photo credit: Prakash Patel for VMDO Architects

Works Cited

1. Henderson, K. and D. Tilbury, Whole-school approaches to sustainability: An international review of sustainable school programs. Report Prepared by the Australian Research Institute in Education for Sustainability (ARIES) for The Department of the Environment and Heritage, Australian Government. ISBN, 2004. 1(86408): p. 979.
2. Deal, T.E., & Peterson, K. D., *Shaping School Culture: Pitfalls, Paradoxes, and Promises.* 2009, San Francisco, CA: Jossey-Bass.
3. Doppelt, B., *Leading change toward sustainability: A change-management guide for business, government and civil society.* 2010: Greenleaf Publications.
4. Kotter, J., *Leading Change: Why Transformation Efforts Fail.* Harvard Business Review, 1995. March.
5. Cloud, J., *Forward, in Education for a sustainable future: a paradigm of hope for the 21st century,* K.A. Wheeler and A.P. Bijur, Editors. 2000, Springer.
6. Cross, J.E., Z.S. Byrne, and M.A.M. Lueck, *Organizational Innovation for Energy Conservation.* 2010.
7. Meadows, D.H. and D. Wright, *Thinking in Systems: A Primer.* 2008: Chelsea Green Pub.
8. Poudre School District, *Annual Sustainability Report*, 2012, Poudre School District, Fort Collins, CO.
9. Heath, C. and D. Heath, S*witch: How to change things when change is hard*. 2010: Crown Business.
10. McKenzie-Mohr, D., *Fostering Sustainable Behavior: An Introduction to Community-Based Social Marketing.* Third Edition ed. 2011: New Society Publishers.
11. Higgs, A.L. and V.M. McMillan, *Teaching through modeling: Four schools' experiences in sustainability education.* Journal of Environmental Education, 2006. 38(1): p. 39-53.
12. Schelly, C., et al., *How to Go Green: Creating a Conservation Culture in a Public High School Through Education, Modeling, and Communication.* The Journal of Environmental Education, 2012. 43(3): p. 143-161.
13. Schelly, C., et al., *Reducing Energy Consumption and Creating a Conservation Culture in Organizations: A Case Study of One Public School District.* Environment and Behavior, 2010. 43(3): p. 316-343.
14. Nolan, J.M., et al., *Normative social influence is underdetected.* Personality and social psychology bulletin, 2008. 34(7): p. 913-923.
15. Barr, S., Leigh, K., Dunbar, B., & Tremblay, K., *Green Schools That Teach: Identifying Attributes of Whole-School Sustainability, in Department of Design & Merchandising* 2011, Colorado State University.
16. Taylor, A., *Linking Architecture and Education: Sustainable Design of Learning Environments*. 2009, Albuquerque, NM: University of New Mexico Press.
17. O.W.P.P. Architects, VS Furniture, and B.M. *Design, The Third Teacher.* 2010: Harry N. Abrams.
18. Nair, P. and R. Fielding, *The Language of School Design: Design Patterns for 21st Century Schools*. 2009: Designshare, Incorporated.
19. Orr, D.W., *Architecture as pedagogy.* Conservation Biology, 1993. 7(2): p. 226-228.
20. Meadows, D., *Leverage points: Places to intervene in a system.* The Sustainability Institute, 1999.
21. Thaler, R.H. and C.R. Sunstein, *Nudge: Improving Decisions About Health, Wealth, and Happiness.* 2009: Penguin Group US.
22. Kensler, L.A.W., *Ecology, democracy, and green schools: An integrated framework. Journal of School Leadership*, 2012. 22(4): p. 789-814.
23. Sobel, D., *Beyond Ecophobia: Reclaiming the Heart in Nature Education*. 3 ed. Issue 1 of Nature Literacy Series. 1996: Orion Society.
24. Cloud Institute for Sustainability Education, *Education for Sustainability: EfS Standards & Performance Indicators*, 2012. Cloud Institute for Sustainability Education: http://cloudinstitute.org/cloud-efs-standards/.
25. UNESCO, *Education for Sustainable Development*, 2012. United National Educational, Scientific and Cultural Organization: http://www.unesco.org/new/en/education/themes/leading-the-international-agenda/education-for-sustainable-development/education-for-sustainable-development/.
26. Timpson, W.M., et al., *147 Practical Tips for Teaching Sustainability: Connecting the Environment, the Economy, and Society.* 2006: Atwood Publishing.
27. Alliance to Save Energy, *Students Leading the Way 2009-2010:Energy Saving Success Stories from Southern California*. 2010.

THE CENTER
FOR GREEN SCHOOLS

centerforgreenschools.org

Center for Green Schools Founding Sponsor

United Technologies