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Transforming Inner-City School Grounds - Lessons from Learning Landscapes

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Transforming Inner-City School Grounds: Lessons from Learning Landscapes

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Introduction

In 1992, a group of parents, elementary school students, school staff and faculty members, neighbors, local businesses owners, and landscape architecture graduate students began a collaborative effort to transform the dilapidated playground at Bromwell Elementary School in Denver, Colorado, into a dynamic environment for learning. The result, unveiled six years later, was the first Learning Landscapes project in the city. Soon thereafter, professors of landscape architecture and their graduate students at the University of Colorado at Denver (UCD) began similar projects at other schools. Over the past decade, Learning Landscapes has evolved into a citywide urban initiative impacting dozens of schools.

The main objective of Learning Landscapes is to strengthen Denver's public elementary schools and their surrounding neighborhoods by designing new multi-purpose school playgrounds that combine elements of a public park and a social gathering place. UCD landscape architecture graduate students and professors work with community members and school officials to design new school grounds that respond to the cultural makeup of the neighborhood, the aesthetic tastes of its residents, and the developmental needs of children.

Figure 1. Bromwell Elementary before and after Redesign



The success of the Learning Landscapes project is founded on a healthy enthusiasm for aesthetics, as well as a pragmatic approach to maintenance, safety and recreational issues. The principal value of a learning landscape is its multi-purpose nature. In an era of limited municipal resources and widespread gentrification,

single-minded urban renewal projects that are forced on communities are neither viable nor sustainable solutions for community redevelopment. By bringing together diverse groups working in concert, a civic process— not just a project— is created. Graduate students provide design services to local communities while learning the value of civic responsibility, and community members engage in hands-on learning while designing, building, maintaining, and celebrating the Learning Landscapes.

While the main objective of this civic process is to reconnect communities with their public schools, a learning landscape playground and park also creates innovative avenues for participatory learning, increases recreational opportunities, and provides much needed green spaces in otherwise heavily urbanized neighborhoods. The learning landscape creates a site for learning and discovery that is fun and ultimately celebrates the cultural and historic character of each distinct neighborhood.

How Learning Landscapes Came About

The ability to transform Bromwell's renovation project into an urban initiative was dependent upon the convergence of four variables:

1. an aging elementary school infrastructure in Denver Public Schools;
2. elimination of court-mandated busing within the city;
3. a "new urban university mandate" that encourages UCD professors and students to work with city neighborhoods and communities;
4. city, state and non-profit funding as a catalyst for implementation.

Aging Infrastructure

Bromwell's schoolyard was not the only playground in Denver in need of major renovation— the average facility age is almost 50 years. In 2000, the grounds foreman for Denver Public Schools, Don Moon, stated that approximately 75 elementary schools required moderate to extensive renovations or upgrades. These included replacing playground equipment, providing irrigation and sod (to eliminate gravel and dirt fields), providing accessibility as directed by the Americans with Disabilities Act (ADA), and providing an outdoor learning environment.

Parents expressed concerns about the safety of many of these sites, including the lack of fencing, limited lighting and dangerous debris found on the school grounds. Many expressed the concern that the playgrounds were simply "asphalt jungles" unprotected from the hot sun and unusable during otherwise desirable play periods during the day.

Figure 2. Cowell Elementary Preexisting Condition**Elimination of Court Mandated Busing**

In 1995, Denver Public Schools was released from a federally mandated school busing plan (Woods 1998). For the first time in 20 years, children could freely attend their neighborhood school. One of the goals of all Denver Public Schools is to open school facilities to the community— to provide places to gather, places to enjoy, and places that enhance the community's appearance (Denver Public Schools 2004). With the elimination of forced school busing in Denver, an unprecedented opportunity emerged to use these schools as catalysts to strengthen and reinvigorate historic neighborhoods. Rather than sit empty and abandoned after school hours, as they did during previous decades, neighborhood schools could serve as landmarks and civic centers celebrating the cultural and historic character of each distinct neighborhood.

New Urban University Mandate

In the late 1990s, the University of Colorado at Denver established the principles of its New Urban University agenda:

1. connect the campus to the community;
2. integrate teaching, research and service;
3. become increasingly user-friendly.

In this academic environment, a synergism developed between Denver Public Schools (DPS) and UCD that resulted in a partnership to conduct master planning and create new designs for the city's elementary school playgrounds. Students in three courses in UCD's College of Architecture and Planning would use the 86 DPS elementary school yards as case studies. These courses focused on the value of the schoolyard as educational and community experience. The courses were sequential: theory and planning; design; and, finally, implementation and construction.

City Funding for Implementation

In the spring of 2000, Lois Brink, a professor of Landscape Architecture at UCD, received a \$1 million matching grant from Denver's Housing and Neighborhood Development Services to assist in the construction of seven learning landscapes as part of the Denver Focus Neighborhood Initiative (City and County of Denver 2004). The Denver Business Improvement District's Regional Plan targeted 16 underserved neighborhoods for capital improvements to community facilities. It was the city's hope that improved overall physical environments would improve quality of life for neighborhood residents and attract new residents and improve property values (Mitchell 2001). The schools initially chosen to receive learning landscapes were located within the 16 focus neighborhoods. These schools have received "low" or "unsatisfactory" ratings in state scholastic achievement tests; close to 90 percent of the students are non-white; 93 percent qualify for free or reduced lunch; and the average student mobility rate is 80 percent.

With the City of Denver grant as catalyst for collaboration, an entrepreneurial and community-based association of public and private interests was established— the Learning Landscape Alliance (LLA)— to fund and implement 22 learning landscapes. By leveraging city and district funds and community in-kind services the alliance could be aggressive and fully fund each project over a three-year period. (The average cost of a learning landscape is \$450,000.) The 22 learning landscapes serve approximately 11,500 students. The alliance completed its mission in 2003 with a total investment of \$10.8 million. Construction is 98 percent complete with the remainder being finished in the summer and fall of 2004 using funds from a DPS General Obligation Bond.

Learning Landscape Objectives

Each learning landscape serves two or more of the following objectives:

1. Provide participatory landscapes that support outdoor learning in tandem with academic and physical education and offer socialization tools for school-age children.
2. Create a multi-generational space for outdoor play opportunities for both students and the community.
3. Create an aesthetically pleasing focal point for the community.

The following is a composite list of all of the components of a Learning Landscape project:

- *Common areas* with trees, benches and chairs that range in scale from plaza to outdoor classroom.
- *Improved hard surfaces for games*, including basketball, tetherball courts, four-square, hopscotch, and wall ball.
- *Natural and "wild" gardens* characterized as habitat, grass, herb, riparian, ecological, native grass and/or rock gardens.
- *Hard surface educational elements*, including painted maps, sight words, mazes, educational games, a compass rose, and the like.
- *Improved multi-purpose fields*, prepared with gravel removal, weed removal, new sod, grading and irrigation.
- *Traditional developmentally-appropriate play equipment*
- *Improved accessibility and safety* with accessible equipment, ramps and pathways and other elements as specified in the Americans with Disabilities Act.
- *Shady places*, such as a shade pavilion and added trees to offer a cool alternative to wide-open play areas that receive full sun during the day.
- *Community gateway*
- *Non-traditional elements* for creative play and/or instruction.
- *Design elements and ordering systems* that reflect a specific design vision and build upon the neighborhood's strengths, history, culture and vision.

Participatory Landscapes for Outdoor Learning

Supporting the Academic Curriculum with Gardens and Landscape Features

Gardens offer experiential and prescriptive avenues for learning (Wells 2000). According to Susan Bardwell with Grounds for Learning (a partner program), learning landscapes offer places for children to wander and experience nature. Four categories have been developed for gardens at the schools:

- Horticultural
- Cultivated
- Ecosystem
- Habitat

Vegetable gardens create significant opportunities for students, especially those from low-income households, to learn about nutrition and healthy diets. In 1995, Tufts University researchers found that significantly larger proportions of poor than non-poor children suffer from substandard intakes of ten key nutrients. Between 33 and 50 percent of poor children have deficient intakes of key nutrients critical to cognitive functioning and overall healthy development. Poor children are 2.5 times more likely to have significantly deficient intakes of food energy/calories, folate, iron, magnesium, thiamin, vitamin A, vitamin B6, vitamin C, vitamin E, and zinc (Cook and Martin 1995).

In Denver, Bromwell, Whittier and Fairmont Elementary schools have joined forces with the Slow Food organization to plant vegetable gardens. Additionally, teachers are using the gardens to develop hands-on learning techniques that support their lesson plans from the Integrated Nutrition Education Program (INP) currently being sponsored at their school by University of Colorado Health Sciences Center with funding from the USDA Food Stamp Nutrition Education program.

Figure 3. Bromwell Elementary Children at Their Fall Harvest



Approximately 75 percent of the learning landscapes have some type of an ecosystem garden. At Bromwell, where the Parent Teacher Student Association (PTSA) has an active role in the school, there is a tall/mid grass native prairie. Urban environments put an undue amount of stress on the establishment of native grasses in a semi-arid climate. It has taken three years to establish the grassland garden at Bromwell, and the PTSA is currently working jointly with UCD to petition the Environmental Protection Agency (EPA) to allow the school to burn its grassland— a mandatory practice to ensure a healthy prairie in Denver. DPS and the surrounding fire districts have approved the burn; the EPA, however, has denied the permit for air quality reasons.

The riparian landscape at Eagleton is a self-sustaining water-harvest garden that collects storm water from the surrounding playground and field to water native cottonwood trees and grasses. The water is filtered through this planted area before being released into a city storm water chase. Poor drainage is a chronic concern on DPS sites. The majority of these schools were built with either negative drainage or drainage towards the building. Riparian landscapes thrive in poor drainage and are an appropriate solution. In the past, Colorado riparian plants, such as cottonwood and willow trees, were on the DPS “do not plant” list. However, riparian landscapes have successfully improved drainage on the school

sites. As they also grow and provide shade faster than other tree species, DPS has reconsidered their value.

Figure 4. Bromwell Grassland in the Spring



In most cases, the ecosystem garden provides a habitat for urban wildlife. Riparian landscapes offer critical urban wildlife area opportunities while improving drainage on school grounds. The butterfly habitat garden, popular with teachers, provides an ideal setting for science lesson plans. Students can inventory the garden as a butterfly habitat, identify all existing plant species, determine which plants were useful as adult and larvae hosts, learn what butterflies might be attracted to the garden, and decide on features that need to be added to the garden to attract butterflies.

The school district does not have the staff necessary to maintain the gardens; therefore, it is very important that the design of the gardens reflect the capacity of the school to take care of them. The gardens must be sustainable and fully integrated into the elementary educational experience. Anecdotal comments collected to date from school teachers and community members express frustration because they want to take care of their gardens but do not know how. The implementation strategy for the learning landscapes held that it was better to build the landscapes first and then to work with the school and community to maintain them. This approach has been successful at Remington Elementary, where Learning Landscapes Alliance partner Susan Bardwell spent the spring and fall of 2003 working with two third grade classes in the school garden as part of an Earth Force service-learning project. She made the following observations:

In the process of tending the garden, the students did weeding and 'virtual bar graphing' of the weeds on the adjacent blacktop, seed collecting and companion lessons, and tree/garden mulching and

companion lessons. Jan Wingate from Denver Botanic Gardens came out to identify some of the 'volunteer' plants/weeds and advise which should/could remain for habitat and which ones to be particularly vigilant about removing.... [The garden at] Remington demonstrates that there is a lot to say for teachers and students working and learning in the Learning Landscape as a way to help sustain the gardens. Without their work and lessons this past year, the fledgling garden at Remington would be a maintenance staff nightmare and an eyesore. It will be again if it doesn't continue to be 'used' by teachers and their students (Bardwell 2004).

Figure 5. Garden Place Butterfly Garden



Supporting the Academic Curriculum with Art Projects

Collaborative art projects conceived and created by students instill a sense of pride and ownership in school grounds and reduces incidences of vandalism (Yost, Di Carlo and Holmberg 2004). Each school has at least one art project as an initial element. The goal is to have a series of temporary installations that renew on a cyclical basis in an effort to sustain community involvement. The most successful to date has been the banner project. The canvases used for the banners, which

last about three years, are inexpensive and readily available. Children decide on themes and make colorful weather-resistant banners that easily mount on vertical poles within the playground. They decorate their banners with bugs, the solar system, sports, common words, dinosaurs, or flags from different nations around the world. At Cowell elementary, an after-school group participating in the Denver Scores program wanted to do a mural as their service learning project. Children worked with their teacher and UCD students drawing images that were important to them, to Denver, and to the soccer community. UCD students created a collage of these drawings and then, using a grid system, transposed and painted the drawing with help from the children onto a 100-by-5-foot wall.

Figure 6. Computer Image of Cowell Denver Scores Mural



The participation of local artists is a successful way to incorporate place-sensitive public art into the school ground and offer art education. At Fairmont Elementary, local artist Tony Ortega worked with the children to create their banners. At Columbine elementary, artist-in-residence Michael Gadlin helped the children create entry banners for the doors leading out to the playground. Local artists also design and construct their own pieces inspired by the children. At Fairmont, a concrete “earth mother” is located in the middle of the play equipment area and teachers have mentioned that children are often seen taking solace in her lap when they have had a bad day.

Larger murals painted on the walls of some schools are civic in scale and serve as a landmark for the community. Smith elementary is a magnet school for the arts; students and artists worked together to paint a theater backdrop on one wall of the school. The budget did allow for an actual outdoor theater, so the 40-by-30-foot mural serves as the backdrop for a pretend stage, complete with curtains and scenery. The mural is a one-point perspective with lines radiating out from the vanishing point across the entire playground. The school’s Word Wall mural, measuring 40 by 50 feet, includes 100 of the most commonly used words in the English language and acts as a backdrop for wall ball. For this mural, conceived by UCD landscape architecture students, the children created shapes and chose text types to match the words. Third through fifth grade children painted the mural with guidance from UCD students, high school students, and a local artist. Wall ball becomes more challenging and interesting for children as they try to hit certain words.

Figure 7. Students from Smith Elementary Painting One of the Murals**Supporting the Academic Curriculum– Next Steps**

When surveyed by the Center of Research strategies, 97 percent of the teachers at Learning Landscapes schools agreed that the playground has improved the beauty of their community; however, teachers were more neutral about educational enhancements. This may reflect the fact that in most of the schools, the playgrounds have been in place for less than two years— a relatively short period of time for curriculum changes to be made. A three-year Technical Assistance Program (TAP) established by UCD, DPS, and the Gates Family Foundation provides assistance to teachers for program development, curricular use of playgrounds, and continued service-learning opportunities. Teachers and students are being trained to maintain the playgrounds with help from TAP interns. This program serves multiple purposes. The TAP sets up a framework for a four-step process, the purposes of which are outlined in a 1990 environmental education study by Hungerford and Volk, namely, to increase teacher' and students' sensitivity,

knowledge, ownership, and empowerment in an effort to create sustainable learning landscapes with continued community support.

Design opportunities for education vary from school to school. Boulders indigenous to Colorado, including igneous, sedimentary and metamorphic rocks, engage students in the geology of the region. Geography and the use of maps has been a consistent component. Principals have expressed a desire to include science and math components into the playground features through elements that incorporate measurement concepts.

Supporting Physical Education

The preexisting conditions at the Learning Landscape project schools were “one-size-fits-all” playgrounds. Young children often used equipment intended for use by older children. Classroom teachers were required to schedule specific times for using the playground, ensuring that pre-kindergarten students were not placed in danger by being in the same play environment as older students.

Effectively designed playgrounds can decrease “uninvolved behavior” and reduce bullying or roughhousing (Weinstein and Pinciotti 1998). Guided and free play on outdoor equipment helps children of all ages develop their muscles, define their sense of space, develop eye-hand coordination, increase body awareness, increase physical fitness skills, develop strength and endurance, and provide opportunities for social play (Moore, Goltsman and Iacofano 1997).

When given a choice between structured and unstructured physical activities, children will typically find fewer opportunities for confrontation with their peers (Boulton 1999; Malone and Tranter 2003). Principals have observed that children learn to interact and problem solve more effectively on a structured playground. Learning landscapes dramatically increase the variety and quantity of structured games available to children. The playground helps teach children to function in a structured environment (Center of Research Strategies 2003).

Additionally, the learning landscapes increase play opportunities and accommodate the entire school population at one time— an important consideration for the hours before and after school. This stands in sharp contrast to an average pre-existing capacity of only five percent of the school population at one time. Structured games on grass and hard surfaces are complemented with traditional age-appropriate play equipment. Play equipment for early childhood education (ECE) focuses on fine- and gross-motor development and includes interactive elements such as sand or water play, along with three different ground surfaces. Given that Denver typically receives more than 300 days per year of sunshine, shade structures are another important element of the program.

Children surveyed during the master plan phase consistently selected play equipment as their first- and second-favorite choices (Brink et al. 2004). Primary play structures emphasize the relationship between play and imagination, incorporating interactive pieces and slides. Climbers, also known as monkey bars,

provide physical challenge, and intermediate structures emphasize climbing and upper body development. Overhead ladders, tall slides, large climbers, and spinning or rotating activities foster development of motor skills, strength, coordination and balance. Climbing opportunities often provide graduated levels of challenge and encourage responsible risk taking.

Improving Socialization Skills

Demographics in the United States have changed dramatically over the last 50 years since most of Denver's schoolyards were built. Children in urban environments once had greater freedom to move about and explore unprogrammed places (Hasluck and Malone 1999). Increased violence in urban areas now means that children have less freedom of movement (Tranter and Doyle 1996; Valentine and McKendrick 1997). The Learning Landscape project has responded by creating unprogrammed non-traditional elements that encourage creative play. As mentioned above, habitat gardens offer wild places where children can experience the "slow wonder" of our world. For example, brightly colored fields of paint at Garden Place Elementary provide an unlimited resource for the imagination— at one moment they are countries to be conquered, the next, islands in the ocean. Different colored curvilinear lines at Barrett Elementary randomly bisect basketball and foursquare courts and become paths, upon which children can travel anywhere the imagination takes them. "Struggle Hill" at Smith Elementary and the erosion hill at Garden Place offer different perspectives. Of the teachers surveyed, 80 percent agree that the new playground promotes creative play (Center of Research Strategies 2003).

Figure 8. Children Play on Garden Place's Erosion Hill



Recess is quite often the only time a child has total control of his activities at school. Playgrounds offer the optimal environment for children to socialize and learn about conflict resolution. Principals and teachers at Learning Landscapes

schools have observed diminished fighting over limited play elements, and children are more physically active and engaged in more positive peer interaction (Center of research Strategies 2003). Different play zones and social areas in the schoolyard encourage children to disperse, thereby giving everyone a place with fewer conflicts.

Scale and elevation are key elements in the design of these places. Subtle changes in elevation are all that is needed to create prospect; this can have a dramatic effect on children. Children are drawn to spaces that are compatible with their size. Spaces that are visible to the playground aides but intimate to children are particularly attractive. At Bromwell, a large boulder next to a pine tree on a hill has all the elements of an ideal intimate gathering place. Sitting under the deck of play equipment or between the columns of a shade structure provides the same small scale preferred by children but still easily monitored by teachers or family members.

In addition, the use of boulders in gardens and throughout the playground has been a positive cost-effective element. Surveys conducted at 40 DPS elementary schools show that boulders are one of the top five preferred playground elements by 90 percent of respondents (Brink et al. 2004). The preferred boulder size is five to seven tons. This allows for two or three children to gather, while still allowing a fourth child to comfortably sit alone and read.

Figure 9. Young Girls Socializing at Greenlee Elementary



Community Focal Point and Civic Pride

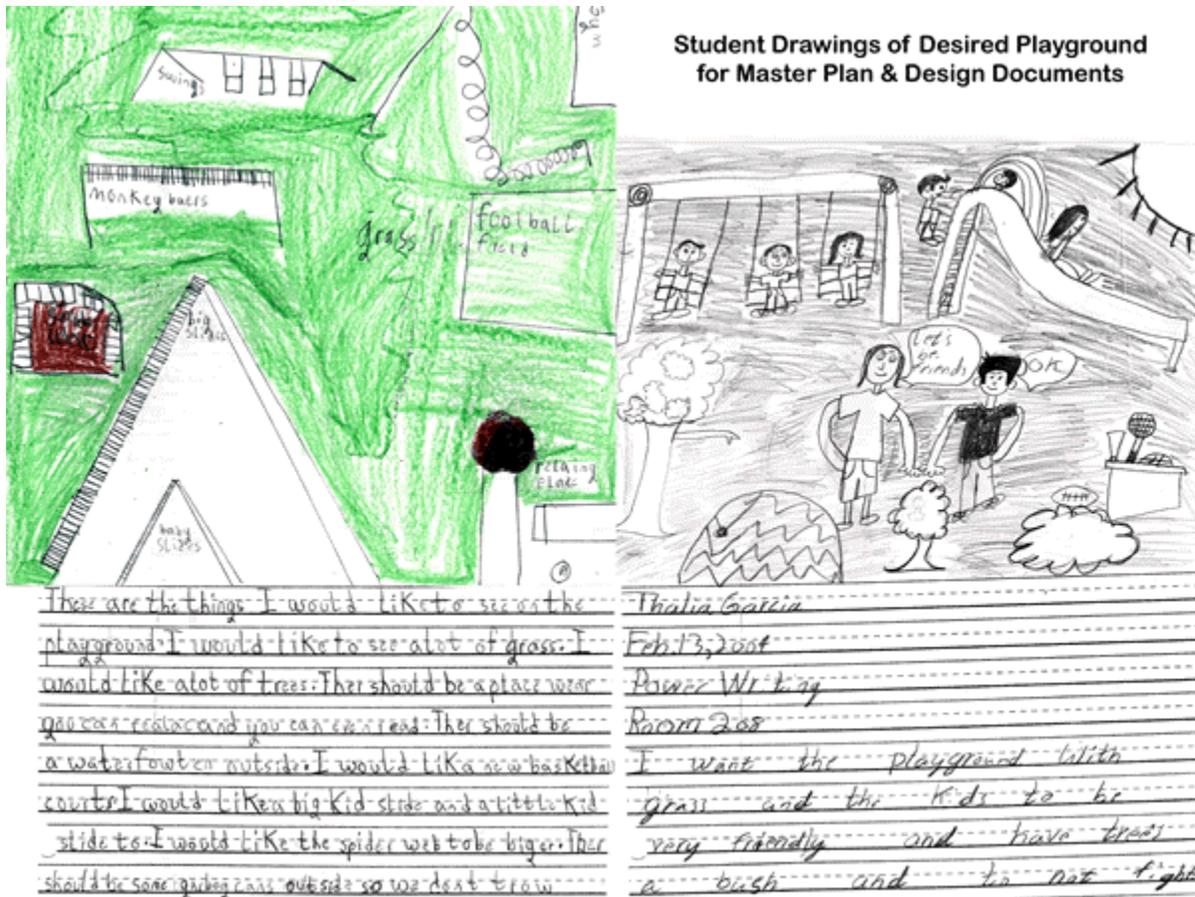
Schools in their pre-Learning Landscape condition sent a message to the neighborhood that the environment for children and the community was not a priority. Chain link fences and obscure entrances sent the signal “DPS property. Keep Out” (Center of Research Strategies 2003). Some communities, disenfranchised from their local school, may have few if any other architectural landmarks that can serve as a source of civic pride. School buildings were constantly vandalized and whenever minor improvements were made to the playgrounds, vandalism followed soon thereafter (Yost et al. 2004). Neighborhood organizations and the schools’ administrations wanted to strengthen the community spirit, but given their challenges, the prospect seemed daunting if not insurmountable.

Learning Landscapes improve community outreach in the following ways:

- Community input during the master plan and design phases of the process
- School/community fund-raising to support the playground
- Community support during the construction of the playground in the form of volunteer builds
- Creating designs that:
 - Encourage use after school and during vacation periods
 - Include community gathering places
 - Enhance the sense of green space in the neighborhood

A collaborative process for planning and design incorporates community input into all phases of the project, and creates a broadly constituted base for funding that includes both public and private partners. Community involvement is a foundation of this program; it fosters a sense of neighborhood ownership and vision (City and County of Denver 2004). UCD landscape architecture students participate in meetings with focus groups of students, parents, staff and administrators at each school to identify elements for the proposed site development. Elementary school students create drawings of what they would like and parents and teachers discuss problems with the current playground. A photo survey of 19 images of possible schoolyard elements serves to solicit initial community/school preferences and encourage everyone to “think outside of the box.” By asking constituent groups to select their five preferred elements, UCD students are able to prioritize components for the master plan and generate a list of community needs and desires.

Figure 10. Student Drawings



Principals surveyed recommend bringing the community into the process even earlier (Center of Research Strategies 2003). However, UCD graduate students observed that it was difficult to get early participation due a general level of mistrust from community members that the project would ever be implemented and a concern about the risks of neighborhood vandalism. Once the master plan is complete, it is distributed to the schools and community for review and comments.

At the onset of the project, the Learning Landscape Alliance solicited support from the school and community to raise two percent of the total funds for the project. Penny drives and selling candy bars were just some of the strategies that empowered students and gave the project a sense of reality and immediacy. Students consistently reported during focus groups that they felt good about having helped create the playground (Center of Research Strategies 2003).

A similar reaction came from the community once construction was underway. The results of a community survey indicated that 23 percent of community residents had participated in the construction of their school's playground (Center of Research Strategies 2003). Projects are always built during the school year so that children and families can be involved. Volunteer dates, established during construction, draw people from the school community and other volunteer organizations such as AmeriCorps, Peer One, Hope Communities, church groups, and neighborhood associations. On average, eight percent of the total project

funds are in-kind contributions from the community, the city and volunteer organizations. Each year, a team of AmeriCorps volunteers has spent six weeks building play equipment, helping children with art projects and planting. Community builds have been an essential element as more than half of the city and grant funding requires community interaction. Each project has two to four volunteer builds organized jointly by UCD and DPS, ranging from 50 to more than 250 people. Typically, the community creates artwork, plants gardens, lays sod, moves engineered wood fiber into play pits, builds playground equipment, and lays bricks. Close to half (43 percent) of the participants say that they are more involved with other school activities that involve the playground than they were before (Center of Research Strategies 2003). The principal of Colfax Elementary School said, "the builds are a wonderful way to bring parents into the school, particularly when language is a barrier."

Figure 11. Volunteer Build Laying Sod at Swansea Elementary



Unlike traditional schoolyard designs, learning landscapes are designed as multi-generational places. Social gathering places designed for school children become community spaces during non-school hours and are used extensively on summer evenings. The shade structure/pavilion acts as a community landmark as well as gathering place and typically offers an excellent vantage point for teachers, parents and grandparents alike to observe children.

Figure 12. Shade Structures at Colfax and Crofton Elementary Schools

Community surveys validate these findings with a 77-percent agreement that the community has a sense of pride in the playground. Further evidence of community support for the Learning Landscapes project was the allocation of \$10 million for completing another 20 learning landscapes as part of a \$300 million dollar general obligation bond (GOB) that received overwhelming voter approval in the fall of 2003.

University Role

Initially, UCD played a neutral role between the city and the school district, which shared a skeptical past relationship with the city and had limited collaboration. The University was an advocate for grantees ensuring that funds were spent appropriately. The University's optimism and confidence was pivotal in generating other public and private funding. The relationship between UCD and DPS goes beyond the 22 schools involved in the Learning Landscape Alliance. To date, UCD graduate landscape architecture students have developed 54 master plans and have prepared 25 sets of design development drawings. At this rate, UCD students will complete the remaining 24 DPS elementary school master plans by 2006.

A year-round, hands-on, service-learning curriculum at UCD enlists graduate students to develop master plans in the fall and design documents in the spring. UCD students prepare master plans comprised of five main components:

1. a vision
2. a set of goals to implement the vision
3. a program of uses
4. a spatial relationship diagram
5. an aesthetic ordering system

The master plan targets existing and proposed uses, relationships between uses, and programmatic requirements for uses, maintenance and safety issues, and preliminary cost estimates.

Once the master plan is complete, the graduate landscape architecture students participating in the Learning Landscape Alliance program move into a design studio where they synthesize the pieces of the master plan into a detailed site design, identifying cost estimates for traditional and non-traditional construction. The end product for the studio is a set of design development drawings. Professional landscape architects are selected to finalize the graduate student's drawings in the form of construction documents. In the summer, students gain valuable experience in independent design-build classes at DPS schools under construction. The construction of the traditional elements of each project goes through the normal bidding process, while the creation of the non-traditional elements are coordinated by DPS and UCD jointly.

The originality and forward-thinking aspects of each Learning Landscape project are directly attributable to the UCD graduate landscape architecture students. They have contributed their time and energy, and have been inspired by the uniqueness of the people and their environments to create unique places. Their ideas and inventions have been a source of inspiration for the professionals executing these designs. AmeriCorps provides tuition grants to UCD students through the Campus Compact Initiative focused on collegiate level service-learning, community-based programs.

Figure 13. Graduate Student Stamping Numbers in Concrete

As Learning Landscapes continue to be built with GOB funding, UCD will continue to provide design review assistance. The main focus of Professor Brink's research will be the long-term sustainability of these urban landscapes and their integration into the day to day rituals of schools and neighborhoods. Learning landscapes are generally outside the realm of traditional DPS site maintenance. UCD and DPS have entered into a three-year technical assistance program (TAP). This program will work with the site-based facility managers and the children to:

- Provide maintenance support and technical assistance to site based personnel
- Offer an awards program for site maintenance success
- Assist with program development of curricular use of playgrounds
- Expand service-learning opportunities for the school/community through the Denver School Yard Consortium.
- Actively seek funding and grants to support programs.
- Continue data collection and surveys to document outcomes.
- Develop programs to monitor and document increasing levels of physical activity, improved social behavior and test scores.

Lessons Learned

The Learning Landscape program at DPS is a dynamic process that is evolving. The hope is to review, evaluate, and modify the process improving on the positive

outcomes. Positive benefits of the playgrounds were reported by the Center of Research Strategies (CRS) in the following areas:

- Reduced safety and disciplinary problems
- Improved student behavior
- Increased use of outdoor learning curricula
- Improved student attitudes toward school and increased readiness to learn
- Increased parental involvement
- Enhanced community pride and use of the playgrounds as “green spaces”

Enhancing Community Involvement and Creating Buy-In

The weakest aspect of community involvement to date has been during the planning phases. We believe tours of built learning landscapes would help community members, teachers, and principals visualize the desired outcomes. Principals who are committed to the project are key to increased community support and awareness. The graduate students’ master plan is the first step in the process. Community comment and criticism are welcome, but have not always been incorporated into the design development drawings. Brink and her students have revamped the master plan as a living document containing folders for comments from community/school and the DPS grounds and maintenance department. As graduate students and other design professionals move into the design phase, these comments can be incorporated into the design.

Volunteer builds are the most positive outcome for community involvement. All 22 schools have agreed to continue having some type of volunteer project in the spring and the fall each year. The technical assistance program will aid in establishing activities as regular events within the calendar year. Ongoing builds will include adding street trees, murals, and artwork, and modifying design elements to increase effectiveness.

Another way to enhance community participation is to study the post-occupancy evaluation of the schoolyard by teachers and parents. Providing them with the tools to let elements evolve and change to suit their needs is an essential part of the technical assistance program and the long term sustainability of the program.

Increasing Teacher Involvement

One of the weaker aspects of the current process is that the time constraints and pressure to improve student test scores impedes teachers’ ability to fully participate in the process of creating a learning landscape. To remedy this situation, funding is necessary for release time that allows teachers to leave the classroom and lets them freely brainstorm possibilities. Release time will be a critical element as Learning Landscapes designers and researchers move into curriculum development at each school.

After School

Fortunately, the 2003 General Obligation Bond, approved in the fall of 2003, has enabled DPS to reinstate art teachers and programs at virtually every school. With the added assistance of these new DPS art teachers, the children will be able to create new art projects that will enhance learning landscapes.

In conclusion, the Learning Landscapes project provides ongoing lessons for everyone involved. Through increased faculty, student, and community awareness and participation, the school grounds evolve. The collaboration of faculty and students at UCD with DPS teachers and students, as well as parents and other community members, allows constant learning and growth for all involved.

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