About School Gardens and Other Campus Green Spaces*

[Note from Center Co-directors:* Our Center is fortunate to be able to benefit from the energy and talents of many UCLA students. Because of her interest in this topic, undergraduate Renata Figueroa drafted and we edited the following brief excerpt to be shared as part of the Center's resources.]

> *In ... a counterpart to the efforts to build high–performance school buildings, those advocating for green school yards aim to transform a school's outdoor environment, turning at least some of it from barren ground or blacktop to a living, healthy space that encourages creative play, environmental education and community participation.*
>
> Green Schools Initiative

> *Ecological schoolyards are outdoor learning environments that teach ecological principles through the design of the schoolyard landscape. They can substantially improve the appearance of school grounds while creating hands–on resources that allow teachers to lead exciting 'fieldtrips'without ever leaving school property.*
>
> Sharon Danks

With increasing interest in improving school climate, there is likely to be greater attention paid to the classroom environment (Center for Mental Health in Schools, 2016; National School Climate Council, 2007). However, just as whole child development is a school-wide concern, so is a school's efforts to enhance its environment.

School environments are complex, and research findings on the impact of classroom and school-wide environment are sparse and inconclusive (see the 2005 review by the design council). At the same time, few educators doubt the importance of improving school environments. One facet of this is a focus on campus green spaces.

Green Spaces to Enrich Academic, Social, and Emotional Learning Opportunities

Schools that have recreational lawn areas, gardens, trees, and other flora reflect a commitment to providing students, staff, and the neighborhood with attractive, aesthetic, and nurturing green space and to promoting greater physical activity by students. Such spaces can be used to provide enriched academic, social, and emotional learning opportunities and to help relieve stress. It has been suggested that having a variety of green spaces helps promote varied recreational and inclusionary opportunities for males and females, students with disabilities, staff, etc. (Dyment & Bell, 2008).

It should be noted that the nature and scope of school green spaces varies greatly. Dyment and Bell (2008) found that only 20% of schools they studied had a focus on green spaces. In those schools, the majority of principals and parents agreed that green spaces not only promoted learning and play, but also that students were more civil (72% agreed), communicated more effectively (63% agreed), were more cooperative (69% agreed), and their interaction with teachers had improved (69% agreed); students also were seen as interacting more positively with each other.

School gardens have received particular attention. Advocates for school gardens suggest that such gardens enable teachers to make the curriculum more engaging and memorable, can enhance learning outcomes, and increase the likelihood that students will eat more fruits and vegetables. Furthermore, Somerset, Ball, Flett, and Geissman (2015) suggest that students who are typically lonely during their free time tend to interact more with other students in productive activities within school gardens. These social interactions are seen as promoting social development, feelings of competence and connection, and enhancing communication skills. In contrast to all this, concerns have been raised about the appropriateness and impact of the school garden movement (Bennett, 2010; Flanagan, 2010).

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*The material in this document reflects work done by Renata Figueroa as part of her involvement with the national Center for Mental Health in Schools at UCLA.

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A Few Notes from the Research

It is unclear how many schools have significant green spaces or how those that do use such spaces. With specific respect to school gardens, while the number has increased in recent years, available estimates are that only 25% of schools have a garden. Those that don't tend to be in low-income neighborhoods, smaller towns, and/or in the midwest (Turner, Sandoval, & Chaloupka, 2014).

Little evaluative data have been gathered on the impact of school green space. An evaluative review of the benefits of school gardens reports that "Quantitative studies showed positive outcomes ... in the areas of science achievement and food behavior, but they did not demonstrate that children's environmental attitude or social behavior consistently improve with gardening. ... Qualitative studies documented a wider scope of desirable outcomes, including an array of positive social and environmental behaviors. Gardening enthusiasm varies among teachers, depending on support and horticultural confidence" (Blair, 2011). The reviewer cautions that "Validity and reliability issues reduced general confidence in these results." Finding from a year long study by Dadvand, Nieuwenhuijsen, Esnaola, et al. (2015 -- published in the Proceedings of the National Academy of Sciences) indicate "a beneficial association between exposure to green space and cognitive development among schoolchildren that was partly mediated by reduction in exposure to air pollution."

An example of a controlled study comes from Robinson and Zajicek (2005). They investigated changes in teamwork, self-understanding, leadership, decision making skills, communication skills, and volunteerism of elementary school students participating in a 1-year school garden program. These students were compared to a nonparticpating control group. "Students in the control group had significantly higher overall life skills scores on the pretest compared to students participating in the garden program but the scores were no longer significantly different between the groups on the posttest scores at the end of the program. In addition, there were no significant differences in the control group's pretest scores compared to their posttest scores. However, the students in the experimental group did significantly increase their overall life skills scores by 1.5 points after participating in the garden program. Two internal life skill scales were positively influenced by the garden program; 'working with groups' and 'self understanding.'"

Skinner and Chi (2012) report that students' perceived autonomy, competence, and intrinsic motivation uniquely predicted their engagement in the garden, which in turn, predicted learning in the garden and achievement in school.

Researchers such as Dyment and Bell (2008) stress that school green spaces may be especially beneficial for students attending schools in low-income neighborhoods. Given that the environment in such neighborhoods and housing often is "toxic," physically and psychologically, schools in general and school green spaces in particular can provide a special haven for children and adolescents.

Ruiz-Gallardoa, Verdeb and Valdésa (2013) focused on the academic and personal impact of a garden-based learning program on disenchanted secondary students. "Over a six-year period (2003–2004 to 2008–2009), 63 disruptive and low-performance secondary school students were integrated into a two-year garden-based learning program, which took place in southeastern Spain. ... Results show that school failure decreased substantially, while the dropout rate was reduced from an initial 30% to zero in some years. Disruptive episode control improved significantly in the classroom, where teachers observed a decided improvement in students' skills, self-esteem, and self-confidence."

School Green Spaces as Learning Venues

One facet of the "green movement" is to enhance the environmental health and ecological sustainability of schools. In this context, the aims include catalyzing and supporting 'green' actions by students, school staff, family members, community stakeholders, and policymakers (see *Green Schools Initiative* – http://greenschools.net/article.php?list=type&type=4).

Beyond ecological considerations, schools use the focus on greening schools to teach about the environment and use green spaces for enrichment activity, specific project learning, and for teaching major facets of the curriculum. An example of tying into the curriculum is provided by a guide from *School Garden Wizard*. It stresses that "Plant-based activities, gardening, and environmental studies provide great opportunities for implementing National and State Science Education Standards. Such opportunities go far beyond the basic study of plants themselves to include life cycles, ecosystems, soil, weather, organisms, and many science process skills such as measuring, charting, collecting data, and reporting" (http://www.schoolgardenwizard.org/wizard/pdf/make_guide.pdf).

In Portland, Oregon, the Meriwether Lewis Elementary School illustrates the environment education program carried out in its Outdoor Education Center. As described on their website:

> The Lewis Outdoor Education Center provides students the opportunity to learn about water conservation, gardening, native plants, and composting. The Outdoor Center includes an outdoor classroom, a greenhouse, four raised beds, rain barrels, a cob bench and apple trees. Lewis partnered with the Building Village Convergence and Portland State University to build an outdoor classroom space covered by an ecoroof. Classes K-5 take part in the Learning Gardens.
> Lewis Garden & Environmental Programs –
> http://www.lewiselementary.org/lewis-outdoor-education-center-and-learning-gardens

Principal Tim Lauer notes that "We didn't start with a grand plan. We've been receptive to ideas and welcome people who want to join us."

Planning, Funding, and Sustaining School Green Spaces

School green spaces are a good focal point for school-community collaboration. Such collaboration is best achieved when schools develop a school-community collaborative operational infrastructure (see *Community Outreach and Collaborative Engagement* – http://smhp.psych.ucla.edu/pdfdocs/book/ch7comm.pdf).

A collaborative infrastructure capitalizes on using workgroups consisting of interested teachers, support staff, and other school personnel and community volunteers (including family members). Those who choose to join a workgroup for greening the campus will bring commitment, expertise, and resources. All this can be supplemented by outreach to local and national resources, including guides on the internet.

For example, there are programs that provide schools with natural resources, such as trees at no cost, for their gardens or general aesthetic (e.g., the National Wildlife Federation Free Native Tree Seedlings – https://www.nwf.org/trees-for-wildlife/about/tree-bank-information.aspx).

Examples of a district's planning documents and links can be found on the Los Angeles Unified School District's website – http://www.laschools.org/new-site/green-spaces/funding/.

Ample guides for developing school gardens are on the internet. Here are a few examples:

- the *Collective School Garden Network* for online information about how to set up a school garden – http://www.csgn.org/
- *Kids Gardening* – http://www.kidsgardening.org/
- *School Garden Wizard* – http://www.schoolgardenwizard.org/
- *Life Lab School Garden Resources* – http://www.lifelab.org/for-educators/schoolgardens/

There are national programs that help with the funding and creation of school gardens. For example, Slow Food USA's National School Gardening Program (NSGP) sends volunteers to subscribed schools, who pay a minimum fee of $30 a year, to help them create and sustain a garden, provide cooking classes for students, and improve the school's lunch nutrition (Slow Food USA, National School Garden Program – http://gardens.slowfoodusa.org/).

For more funding sources, search the web for “school garden grants 2016."

Programs that provide funding to develop green spaces often offer some ongoing assistance in taking care of the trees, plants, and vegetation. And as illustrated by the Meriwether Lewis Elementary School’s environment education program, local businesses and volunteer groups can provide resources, help build physical infrastructure, and can play a role in ongoing maintenance.

What to Consider When Creating a School Garden

In reviewing the literature, Renata came away with the following views about how to create and sustain a school garden

- Be sure to have a lead person who knows about horticulture to guide the gardeners (e.g., in terms of when to plant certain foods and plants and appropriately care for them).
- Seek out school staff and volunteers who are truly interested in participating and provide them with ongoing support and guidance.
- Involve students as much as possible in planning, construction, and sustaining the garden (and other school green spaces). Develop consensus about what will be grown with a view to enhancing student motivation. Ensure spacing over the year to maintain motivation. (When students finally pick the ripe products, they are literally reaping the rewards of their efforts.) As much as feasible, students should learn that creation of a similar garden can be done at home.
- Make certain the garden is accessible for students with disabilities.
- Encourage the teaching staff to incorporate into the curriculum what students’ experience in the garden and provide guides to help them make the link with requirements.
- Remember that students get attached to their gardens and will be quite upset if it is vandalized, so ensure the garden's security.

Concluding Comments

While few school stakeholders argue against the value of school green spaces, the debate about the development of school gardens underscores the need for more research and analyses. Needed at this juncture is not just more evaluative research, but a cost benefit analysis that clarifies which subgroups of students benefit and how much. This is particularly critical to policy discussions about how to invest the sparse resources available to enhance equity of opportunity at school by addressing barriers to learning and teaching and re-engaging disconnected students.

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