

Thinking Outside The Building

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Abstract

In response to the health crisis, they set up schools on abandoned ferries; classes were held on rooftops and in nearby forests.⁴

The above quote is not a description of contemporary educational spaces in response to the current COVID-19 pandemic. Rather, this is a description of outdoor learning environments established in response to the early 20th century tuberculosis crisis. At the time, there were 65 such outdoor classrooms established as alternative teaching and learning environments.⁵ However, once the health crisis subsided, learning returned indoors.

This paper will briefly trace the intermittent history of the design and use outdoor classrooms in PK-12 educational settings, including an examination of the nascent but growing movement for contemporary outdoor learning environments, culminating in a case study project focusing on the design and construction of a series of modest outdoor educational installations for a California elementary school, with the aspiration that these spaces might inspire outside teaching and learning. A group of advanced architecture students, with input from the children clients and under the supervision of a faculty advisor who is a licensed architect, transformed a series of empty spaces at a local elementary school into interactive outdoor learning environments. As a design-build exercise, these hands-on projects took these students out of the traditional studio and into an interdisciplinary professional experience.

While these case studies were originally inspired to function as spaces for environmental learning, there is a growing interest in outdoor learning environments in

order to provide a viable alternative to the current challenges with indoor learning due to the COVID-19 pandemic. Particularly during this pandemic, marginalized students are more likely to be further disadvantaged due to unequal access to online education as well as additional economic and social stressors on top of home confinement, all of which further increases the learning gap.⁶ Access to outdoor learning environments could provide one answer to the current challenges of accommodating in-person learning.

Taking advantage of the restorative and calming potential of the natural environment, outdoor classrooms could provide an alternative pedagogical setting to assist with the return to in-person learning while also providing an opportunity for designers to critically re-examine generic learning environments.

Keywords: outdoor classroom, design/build

Historical Context

Clearly, children are drawn to the outdoors for unstructured play. In contrast, in more structured learning environments, actively engaging with the outdoors as a teaching/learning opportunity is a novelty. From an historic perspective, for those learning environments that did engage with the outdoors, the notion of “outdoor learning” arose in response to disease. One of the first open-air schools was located in Charlottenburg, Germany. This “waldschule” [forest school] was opened for “delicate children of needy families” in response to a rampant tuberculosis outbreak.⁷ As a comparison, death rates due to tuberculosis at the time were higher than those experienced currently in the U.S. due to COVID-19. Lacking a vaccine response at the time, the solution was

to focus on designed environments to allow for light and air.

The first formal open air school in the U.S. was the 1908 Providence Open Air School, the brainchild of two enterprising women doctors. On the eve of World War I, the U.S had 150 open-air institutions in 86 cities; like the German example, these were all established as a response to tuberculosis.⁸ However, with the discovery of antibiotics after World War II, interest in these outdoor schools began to fade.

A few decades later, a rising sensibility about the environment resulted in a resurgent interest in outdoor education, particularly in Europe. “Skovbørnehave” [forest kindergartens] were initiated in Denmark in the 1980s, a type of learning environment developed due to a lack of indoor facilities for preschool children.⁹ The predominant aim of these “forest kindergartens” was to engage directly with the natural world in order to educate children. The abiding educational principles of these learning environments was “to be able, to experience, to enjoy, to understand.”¹⁰



Fig. 1. Plén Air School, 1930s, France

As a subset of “open air” or “forest” schools, the use of school gardens for their pedagogical potential has had its own and occasionally related history. Historically, the numbers of school gardens have fluctuated in the United States. The U.S. Department of Agriculture estimated that there were 75,000 school gardens in 1906; the

movement maintained momentum during the war years but saw a decline in the 1950s.

There was a resurgent interest in school gardens in the 1970s and again in the 1990s, leading to the efforts that are evident today.¹¹ A 2017 survey of early childhood educators revealed that there were 250 nature pre-schools and forest kindergartens in 43 states serving over 10,000 children per year.¹² Other contemporary programs and installations include the Life Lab in Santa Cruz, the Edible Schoolyard in Berkeley and in Brooklyn, and Michelle Obama’s “Let’s Move” campaign, to highlight just a few initiatives. These and other programs serve as exemplars for garden-based learning. It is important to note that despite school funding cuts for basic classroom support, the arts, field trips, and other aspects of education, the school garden movement has grown over the last decade. This is due primarily to the dedicated and often voluntary support from teachers, students, and parents.

Motivating Factors

While there may be a myriad of motivations for schools to consider when pondering the possibility of creating outdoor learning spaces, this paper will focus on a crucial handful of these considerations: COVID-19; the contemporary condition of the American educational system; equity; public health; food systems; and biophobia.

COVID-19

The current worldwide COVID-19 pandemic has led to a resurgent interest in outdoor learning spaces. Any number of creative and often ad-hoc learning spaces have emerged in response to the need for fresh air access as well as spatial distancing. According to Green Schoolyards America, outdoor learning environments offer “a cost-effective way to reduce the burden on indoor classrooms while providing fresh air, hands-

on learning opportunities, and the health benefits associated with increased access to nature.”¹³

Despite all the interest, it is impossible to discern the number of schools that have created outdoor learning spaces across the country in response to the pandemic. From researching available news sources and online case studies, it is clear that school districts are working with constricted budgets and timelines, with the result that many of these newer outdoor learning spaces are improvisational (pop-up tents; tarp coverings; etc.). While such temporary shelters are appropriate given the circumstances, the longer-term question will be whether these outdoor learning areas will survive once the pandemic threat has passed.



Fig. 2. XXXX Elementary COVID-19 Outdoor Teaching

Equity

The historic outdoor learning environments cited earlier in the paper served children ill with tuberculosis; some targeted struggling and working families. However, once that particular health crisis was over, the use of outdoor learning spaces began to shift, to cater instead to more privileged sectors of society. It is also a fact that COVID-19 has further revealed societal inequities in school children:

“Dr. Gail Christopher—director of the [Natural Collaborative for Health Equity](#) and former Vice-president of the Kellogg Foundation—points out that exclusive or excessive virtual learning deters academic progress for

*students who are disadvantaged by systems of inequity, leaving them even farther behind their peers. She also highlights the negative mental health effects of screen time for all children, many of whom are already suffering increased stress due to the pandemic, confinement at home, the economic crisis, racism and unrest in their communities. “This moment offers an opportunity for us to move learning outside in natural settings, which are restorative and calming. This will reduce cortisol [fight-or-flight] hormones in children, which science shows improves students’ overall cognition and health.”*¹⁴

On the face of it, the opportunity for outdoor learning seems like the perfect opportunity to seek equity in education. After all, everyone should have access to the outdoors. However, we have to acknowledge that not all outdoor spaces are “equal” and not all are conducive to learning. In addition, creating an effective outdoor learning environment requires more than simply space outside. It requires resources of all kinds: human capital (educated and willing teachers); money (to create supportive spaces and to continue to maintain them over the long term); time (to prepare, to create, to balance other educational imperatives); and creativity (to deliver content in a way that still “fits” within a standards focused educational system). Ensuring durable and equitable educational access will require focus, energy, and dedication, whether it is inside or out. Unintentionally, the COVID-19 pandemic may provide an opportunity to jump-start such a movement, to the ultimate benefit of particularly under-served students.

Contemporary Education

If educators are to help heal the broken bond between the young and the natural world, they and the rest of us must confront the unintended educational consequences of an overly abstract science education: ecophobia and the death of natural history studies.....Although some pioneering educators are sailing against the wind, participating in an international effort to stimulate the

*growth of nature education in and outside classrooms....many educational institutions and current educational trends are, in fact, part of the problem.*¹⁵

Currently in the American educational system, there is increasing pressure to respond to academic performance metrics and the resultant drive to “teach to the test.” It has taken some time for environmental literacy to receive any attention. At the national level, there was a cursory reference in President Obama’s “Blueprint for Reform,” which mentioned environmental education as part of “ensuring a well-rounded education.”¹⁶ Even at the U.S. Department of Education, the emphasis is more on science and math; STEM disciplines are called out as essential toward the realization of a more sustainable future.¹⁷ Instead, supervision of environmental education falls under the purview of the EPA; participation in such initiatives is elective and not required. Some cities and states have developed their own goals. As a result of the pressure to measure up to generalized national standards, teachers often end up emphasizing skills and knowledge that improve test performance at the expense of students’ developing deeper, more holistic critical and systems thinking skills.

In addition to the lack of required emphasis on environmental education within the classroom, the physical organization of many public schools are not inspiring exemplars of sensitive and contextual environmental responsiveness. In fact, many school sites were designed and built with little or no concern for ecological responsiveness. In addition, according to Lawrence Berkeley National Lab researchers, California schools currently use 85,000 relocatable classrooms statewide, with anticipated increases of 4 – 10,000 units per year.¹⁸ Not only do many of these units have notoriously poor energy performance and indoor air quality, they are typically not sited in a way that inspires environmental thinking.

Health

*According to the surgeon general, obesity today is officially an epidemic; it is arguably the most pressing public health problem we face, costing the health care system an estimated \$90 billion a year. Because of diabetes and all the other health problems that accompany obesity, today's children may turn out to be the first generation of Americans whose life expectancy will actually be shorter than that of their parents.*¹⁹

It is widely known that the average American spends as much as 90% of their time indoors.²⁰ The result is increasing inactivity, associated health problems, and a lack of connection with the natural world. The current pandemic has amplified this challenge. The statistics for youth are particularly alarming, with the average American child getting as little as 30 minutes a day of unstructured outdoor play²¹ which is less than prison inmates, who average 2 hours/day of outdoor time.²² Simultaneously, children spend more than seven hours a day in front of an electronic screen, according to data taken prior to online learning forced by the current pandemic.²³

Health and behavioral issues continue their prevalent rise in the U.S. Obesity is a near pandemic, with one in five American children considered overweight or obese, a rate that has tripled since the 1970s.²⁴ Diabetes rates are also rising, with this being the most common chronic disease for American children, according to the CDC. In addition, the diagnoses of behavioral challenges such as autism spectrum disorders, ADD, and ADHD have also increased. Currently one in six children is diagnosed with some sort of developmental disorder, according to U.S. Centers for Disease Control and Prevention. All of this combined data represents more than a public health crisis; this may also embody a failure to nurture effective future environmental stewards.

Food System

The contemporary American food system contributes to children's health challenges. As part of their research work on this issue, my students working on this project noted:

*“Cheap” readily available food is convenient for the consumer. But the ease of purchasing these products hides the true cost associated with its production and consumption. Nitrogen-based fertilizers and synthetic pesticides wreak havoc on the environment. Billions of tax dollars subsidize corn production; monoculture destroys local diversity.... Many people feel that food should be quick, cheap, and convenient; they have little awareness of or connection to the source of their food. The processes that bring us our food are often separated from our daily lives.*²⁵

This societal challenge represents an opportunity for schools to use creative teaching tools to teach students about food systems and the effect of these systems on the overall environment.

Biophobia

*[American biologist Edward] Wilson and others have argued that such declines in biophilic behaviour could remove meaning from nature, translating into a loss of human respect for the natural world. In fact, the loss of desire to interact with the natural world, resulting in a decreased appreciation for the diversity of life-forms that support human survival, has been cited as a potential factor contributing to environmental destruction and the rapid rate of species extinction. Thus, reestablishing the human connection with nature has become an important theme in conservation.*²⁶

In professional circles, there is currently a healthy debate about whether the lack of connection to the natural world is leading to increased “biophobia” [fear of the natural world].²⁷ Perhaps even worse than fear of the natural

world is the lack of connection to it, leading to decreased association with and therefore decreased sense of urgency to protect the environment. Reestablishing connections between humans and the natural world has become a growing theme in the world of conservation.

Environmental education for children may lead to enhanced connectedness and ultimately a sense of responsibility and stewardship of the environment. It is most effective when this learning is firsthand. Mediated experiences, such as nature shows and movies, are not enough.²⁸ Children need direct contact with nature in order to begin to understand our interdependency with the natural world. Consider the teaching of technology: would we teach children about technologies such as computers without giving them access to these machines? With more and better access to technology, many Districts are allocating more educational time to “screen time;” with the current pandemic, “screen time” has become an essential life-line to education. In contrast, what if Districts began mandating “dirt time” as part of the lesson plan for environmental education?

“Nature Child Reunion”

*Too many children are naively parroting clichés from someone else's environmental agenda about environments entirely removed from their own experience. We need children to become highly reflective, even critical, participants in environmental issues in their own communities. We need them to think as well as act locally while also being aware of global issues.*²⁹

Given contemporary environmental challenges, educating future environmental stewards is essential. How can children love (and be expected to preserve) that which they don't know nor for which they have no affinity? This is no small challenge and cannot be overcome without an effective and proactive plan of action.

At the national level, leadership has faltered in the area of children's environmental literacy. In 2013, Senator Jack Reed (RI) and Congressman John Sarbanes (MD) reintroduced the bipartisan "No Child Left Inside" Act (NCLI, HR 2702) to the 113th Congress with the goal of improving American children's environmental literacy [ultimately this bill did not receive a vote].³⁰ To fill that void, non-profit organizations such as the Children & Nature Network have stepped in, helping cities and states connect children with the outdoors, with several adopting a Children's Outdoor Bill of Rights.³¹ Another non-profit, Green Schoolyards America, has garnered the support of hundreds of volunteers along with 20 partner organizations in over 40 states and 6 countries, all deployed to help schools to envision and realize outdoor learning spaces at their locations. Their vision is clear:

"Green Schoolyards America seeks to transform asphalt-covered school grounds into park-like green spaces that improve children's well-being, learning, and play while contributing to the ecological health and resilience of our cities. We are working to change the norm for school ground design, use, and management so that all children will have access to the natural world in the places they already visit on a daily basis."³²

While providing school gardens, outdoor learning environments and developing environmental education curriculum may not provide a quick panacea to all of the challenges presented in this paper, research suggests that these proactive proposals can begin to provide an alternative approach toward developing children's ecological awareness as well as contributing to their overall health and wellbeing. In addition to the obvious lessons provided by nature as a result of learning in nature, it has been demonstrated that students increase their critical thinking skills³³ as well as improve their social interactivity through these learning experiences.³⁴

It is important to note that lessons learned in the garden can be more than simply learning about plants and animals (though these are of course essential). Creative teachers and volunteers use these outdoor environments to teach about math, science, art, society, literature, and so on. In fact, Life Lab has recently developed a garden-based learning initiative to assist teachers in applying "common core" lessons [new academic standards for math and literacy] in the garden.³⁵

"Nature's Classroom" and the "Green Corner"

"An environmental-based education movement—at all levels of education—will help students realize that school isn't supposed to be a polite form of incarceration, but a portal to the wider world."³⁶

Our humble design/build interventions were an attempt to respond to the outlined environmental, societal, and educational challenges by providing a localized response. As part of their research for these projects, the architecture students who worked on these projects reflected:

In an age of rampant environmental problems and health crises, teaching children to think ecologically is paramount. Furthermore, in a culture where convenience often comes first, our connection to the natural world is largely invisible: children fail to understand where their food comes from or where their water and trash goes.

The importance of teaching children about nature is obvious, but how we teach them can be so much richer. Outside, children learn differently: all of the senses are engaged. A curriculum designed to teach ecology with nature can be integrated across disciplines, tying everything children are learning together into a larger picture. Our task is to enrich that learning experience even further by giving it spatial form, not only by providing the surfaces and spaces where learning can happen, but also by designing the lessons into the built product. "Nature's Classroom" aims to take the idea of 'school

garden' and make it even more powerful by suggesting connections and relationships between curriculum and physical surroundings.



Fig. 3. "Nature's Classroom"

Taking advantage of potential synergies offered by an existing school garden, the first intervention proposed the transformation of an empty space adjacent to the garden into an interactive outdoor learning area. [Ironically, this empty space was originally slated for the placement of a relocatable classroom]. The garden itself was already equipped with planter beds and a tool shed, but was lacking a supportive teaching/learning/working space in order for it to realize its full learning potential. In addition, there was no adequate shaded area for gathering. The "Nature's Classroom" installation provided for an interactive gathering space for garden and other ecologically focused lessons and also supported activities such as renewable energy and conservation demonstrations, science experiments (plant dissections, insect observations, etc.), math and language arts lessons, visual art projects, among many other creative lessons. The space was designed to be engaging in order to support and encourage active learning. Though it was completed prior to the COVID-19 pandemic, "Nature's Classroom" has served the school well by providing a ready-made outdoor learning space the serves an urgent need in support of the return to in-person learning.

Included in the project's components was a shade structure constructed with bamboo poles and a fabric cover, which can be seasonally removed for the colder months. The structure became a lesson about building with bamboo, a renewable resource that is underutilized in this country. Aside from the shaded gathering space, other learning zones included: an outdoor teaching wall (chalk/writing space), a human sundial, a sculptural hand-and-vegetable washing station (with grey water recycling), as well as prep/work tables. These installations demonstrated ecological principles in a playful and engaging manner, supporting the mission of the project.

The second intervention, the "Green Corner," responded to the need for the youngest children to have a simple outdoor area in which to gather for snack, for respite and for short lessons. For years, teachers and students alike have complained that there was little to no contact with more natural elements in the kindergarten play area. In addition, the area provided very little shade for the kindergarteners on hot days. The "Green Corner" was a modest initiative to remove some asphalt in an under-utilized corner of the kinder play area and to carve out a softer, greener area of respite from the rest of the play yard. We planted a shade tree and poured convertible sono tube bench/umbrella stands [the umbrellas providing shade until the tree is mature enough to take care of this task]. Student-built benches constructed from fallen trees and FSC redwood compliment the area, giving the kinders a place to rest, to observe, and to create.



Fig. 4. "The Green Corner" (before and after)

Learning From Doing

Not only do these projects offer valuable learning opportunities for the children, but they also offer opportunities for community involvement and student stewardship. The projects have generated excitement amongst teachers, parents, and students (of multiple levels). For some of the installations, the elementary school students were involved in the design process, adding to their sense of ownership. As a result of this process, more teachers have expressed interest in using the garden and the new outdoor learning spaces, and the young students are eager to be involved.

There are 98,000 public schools serving more than 50 million PK-12 students every day in the U.S., sitting on roughly 2 million acres of land.³⁷ With collective will and effort, we should be able to capture the opportunity to take learning outside. As Sharon Danks, CEO of Green

Schoolyards America, has noted, we should make outdoor learning plan "A" rather than plan "B."³⁸ In addition, teaching outdoors does not require special training. In fact, these installations (and others like them) can provide opportunities for enhanced learning and could assist teachers as they work to fulfill the standards established by the California Department of Education. In fact, these spaces may also refresh teaching approaches as they offer non-traditional platforms for delivering lessons. In particular, these hands-on, experiential outside learning spaces offer lessons in physical, life, and earth sciences; opportunities for investigation and experimentation; opportunities for reflective and analytical writing [journaling about garden and ecological lessons]; lessons in math; and opportunities for exploring nature through the visual arts, among other lessons. Since all kids are served by public schools, there should be no question about equitable access for all to these essential activities.

On top of the outlined benefits, these projects also provide an excellent opportunity for educational cross-pollination, as advanced college students apply and share their knowledge with a younger generation of students. It could serve as an excellent model for other similar projects, which takes both learning communities out of the traditional classroom and into a more active and interactive teaching and learning mode. In an era in which ecological awareness is an imperative, these types of projects offer alternative approaches to raising environmental consciousness. With the aim of capitalizing on childrens' natural tendency toward inquiry, outside learning environments may provide just the type of alternative that we need to counter our increasingly internalized and technology dominated world:

*"It's time to turn education inside out....School grounds and the natural infrastructure that exists in every community can be activated for effective learning."*³⁹

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