

CONTENTS

| | |
|--|-------------|
| <i>Preface</i> | <i>ix</i> |
| <i>Acknowledgments</i> | <i>xiii</i> |
| | |
| PART I | |
| Learning Gardens, Living Soil, and Sustainability Education | 1 |
| 1 Introduction: Modern Imperatives for Life and Learning | 3 |
| 2 Learning Gardens and Life's Lessons | 15 |
| 3 Living Soil as Metaphorical Construct for Education | 41 |
| | |
| PART II | |
| Learning Gardens Principles Linking Pedagogy and Pedology | 55 |
| 4 Cultivating a Sense of Place | 57 |
| 5 Fostering Curiosity and Wonder | 75 |
| 6 Discovering Rhythm and Scale | 89 |
| 7 Valuing Biocultural Diversity | 105 |

| | | |
|--|---|------------|
| 8 | Embracing Practical Experience | 120 |
| 9 | Nurturing Interconnectedness | 133 |
| 10 | Awakening the Senses | 146 |
| PART III | | |
| Practice Comes Alive from the Ground up | | 159 |
| 11 | Teacher, Principal, and Superintendent Perspectives | 161 |
| 12 | Moving Forward | 195 |
| | <i>Epilogue</i> | 202 |
| | <i>Appendix: Selected Resources and Programs</i> | 204 |
| | <i>Bibliography</i> | 209 |
| | <i>Index</i> | 218 |

PREFACE



Sowing the seed,
my hand is one with the earth.
Wanting the seed to grow,
my mind is one with the light.
Hoeing the crop,
my hands are one with the rain,
Having cared for the plants,
my mind is one with the air.
Hungry and trusting,
my mind is one with the earth.
Eating the fruit,
my body is one with the earth.

Wendell Berry (1970a, pp. 57–58)

2

LEARNING GARDENS AND LIFE'S LESSONS

In this chapter we establish learning gardens as legitimate academic venues through surveying national model programs and exploring theoretical frameworks that help locate and explain the learning that occurs in the learning gardens. While learning gardens have emerged as a popular school-level activity, lacking a thorough theoretical framework, they risk fading away as yet another fanciful educational trend.

While we ground learning gardens as rigorous academic venues that enhance learning, we emphasize ways in which they shift the underlying metaphorical orientation of modern schools. Students, teachers, and communities use learning gardens as pathways toward sustainability education at many levels, moving toward partnerships that link life with learning, schools with neighborhoods, neighborhoods with bioregions, and nature with culture. Below, consider students' quotes about their experiences in school learning gardens.

It is important to listen to nature because nature is so beautiful to look at!
Why shouldn't it be just as beautiful to listen to?

(3rd grade student)

Today we tasted rainbow chard. The dark green leaves tasted kind of bland but the yellow or red stems tasted really good—kind of sweet in a really cool way. They also tasted fresh. We also tasted a kind of yellow flower called *nasturtium*. It had a dark yellow center and the yellow part was sweet and the red part was spicy. I also watched a spider rebuild its web.

(4th grade student)

The Learning Gardens is a time to be in your own little world. Letting your imagination go wild. Planting dreams in the ground and see them grow. If I can do this ... take care of a plant, then I can see that I can take care of anything. I can take care of myself and help myself and others.

(6th grade student)

“When we try to pick out anything by itself, we find it hitched to everything else in the universe,” wrote John Muir (1911). As seen in the student voices above, Muir’s observations are manifested daily by students sensitized in ways that only nature teaches: these third, fourth, and sixth graders are learning to observe, to taste, to smell, to listen, to touch, and to care. They are able to discern and differentiate, imagine and connect, all the while learning about life directly from soil and nature in the gardens that they can step into right outside the doors of their school. One student joyously reminds us that nature is more than just a visual phenomenon to be seen. Beyond her suggestion that we also listen to nature is a nuanced understanding of the depth of relationship possible among humans and the environment. A second student deliciously describes tasting a new vegetable—rainbow chard—using fine details to distinguish among various parts of a new plant. Increased exposure to novel foods can improve children’s eating habits; moreover, this quote demonstrates cultivation of exquisite observational skills in tandem with new taste buds. Another student makes a beautiful metaphorical leap, describing “planting dreams in the ground and [seeing] them grow.” This student links the skills that he is learning in the gardens with the life skills needed for care of self and community. These brief quotes from students in learning gardens show multiple levels of learning and meaning making beyond memorization of facts and figures. For example, in Figure 2.1, students draw upon their study of geometry as they lay out plants in a hexagonal planting pattern. In contact with the living world in learning gardens, these students are broadening their understanding of life’s mysteries even as they gain academic skills.

This is in stark contrast to much of education vis-à-vis schooling where teaching and learning are enclosed within the four walls of the classroom supported by wood and bricks, steel and glass, separating the exterior of the building from the interior. The physical structure of the building is interrelated to an overall educational paradigm, transmitting a hidden curriculum that often ignores life and is disconnected from the surrounding community.

To counter the manifest and literal lifelessness of schools and classrooms, since the early 1990s an emerging national movement in the United States has been focusing on shaping the school grounds hitherto covered with asphalt or manicured lawns into green schoolyard habitats and school gardens, a prototype of which is seen in Figure 2.2.

This resurgence of interest over the last 20 years has resulted in the establishment of thousands of school gardens across the country. Given the



FIGURE 2.1 Digging and planting



FIGURE 2.2 Students planting in a newly transformed garden: a year prior, this site was an abandoned school lot

4

CULTIVATING A SENSE OF PLACE

No place is to be learned like a textbook or a course in a school, and then turned away from forever on the assumption that one's knowledge is complete. What is to be known about it is without limit, and it is endlessly changing. Knowing it is therefore like breathing: it can happen, it stays real, only on the condition that it continues to happen.

(Berry, 1991, p. 75)

It's like I'm a member. I'm home. I'm safe. I'm comfortable.

(Student, Learning Gardens)

In this chapter we ground learning gardens in local school and community contexts, while simultaneously exploring the challenges for education in an era of globalization. Living soil can be a guide in framing place within an ecological context, as soil is composed in place over time and plays a significant role in creation of place, through influencing establishment of plants, land-use patterns, and cultures. Significantly, soil and culture exist in reciprocal relationship: culture contributes as much to soil life, conservation, or degradation as soil conditions contribute to cultural life and diversity of places.

Living Soil and Local Place

Living soil nurtures a vibrant biotic community endemic to place and supports locally adapted plants and food crops. The connection between food and place is often overshadowed in a global food economy, but many of us still find pleasure in food harvested from local soil and even more so when it is grown personally. Something special is carried forward in each bite of food derived from local

soil—we are actually able to taste our place and connection to the biotic community.

The living soil of school learning gardens is necessarily local and bound to the climatic and cultural constitution of place. It is in the terrestrial living soil of learning gardens that the proverbial “seeds of change” germinate, grow, and thrive. Thus soil is a relevant medium for thinking and learning about place in both the literal and the metaphoric sense, as discussed in earlier chapters. Soil provides a unique multifaceted and delicious venue for developing place consciousness. School grounds can be that setting. Food and soil draw our bodily and mental attention at once to the local and ecological relations embedded in each calorie or clod. Producing food for humans, food for pollinators and wildlife, and also food for thought, learning gardens serve as sites of creative re-imagining of possible place-based relationships in the era of globalization.

The infinite variety and uniqueness of places is generated through recursive confluences of biogeography, language, climate, and culture. Observing the variations in climate, flora and fauna, dialects, and food, is how one knows a new region has been entered, and this recognition may inspire both appreciation of difference and reflection upon one’s home region. Travelers often remark upon such differences when arriving in a new area, seeking to contextualize new experience in relation to place. Variation from one community to another reflects the endless potential of human ingenuity in adapting differing conditions to meet common needs such as food, shelter, and meaning. Observing the diversity found in local responses to place can sustain the senses, stimulate awareness, conjure memories, and inspire novel ideas. The uniqueness of place is embodied in the soils of diverse school learning gardens.

Groundedness in Place

Groundedness in place refers to a reciprocal relationship in which one nurtures and is nurtured by the surrounding social and ecological environment. A tree, for example, forms such a reciprocal relationship with place: while it is rooted in specific soil, bounded by contingencies of water, air, sun, space, and so forth, a tree at once contributes to shaping its own environment through shedding water, casting shade, and dropping leaves which then become mulch. Thus the tree and its terrestrial home are intimately linked, each contributing to the life of the other. Education that is grounded in place is likewise motivated by an interest in forming reciprocal relationships with the local environments where students and their families dwell. Students may, for instance, test water quality in local watersheds, serve food to homeless people in their community, participate in farmers’ markets, map endemic flora and fauna, plant native plants to restore degraded natural areas, or monitor urban air quality in the school neighborhood. These activities focus attention on the local particularities of global phenomena. In this way, “place” is informed by interconnections between local relevance in a

8

EMBRACING PRACTICAL EXPERIENCE

Anybody can dig a hole and plant a tree. But make sure it survives. You have to nurture it, you have to water it, you have to keep at it until it becomes rooted so it can take care of itself.

(Maathai, 2006)

I get to work the soil and plant. It's hands-on instead of talking about it, I get to dig and get messy. That's my favorite thing.

(Student, Learning Gardens)

It is widely recognized that not all students flourish in a didactic, abstract, and reading- and writing-centric learning environment; many children and youth integrate new information best through practice or bodily engagement. The planning and planting of a school garden presents multiple opportunities to engage diverse ways of learning and brings all students into the conversation about life. Experience with the real world teaches us in profound ways. Active engagement, embodied learning, and practical experience are foundational to transformational education. In this chapter, we embrace practical experience in learning gardens as a dynamic form of engagement that animates teaching and learning and brings life to schools.

Life's Teachings in Soil

When children come into close bodily contact with soil in learning gardens, when they can actually feel soil "tilth," when they can personally compare the relative presence or absence of earthworms in different soils, issues of sustainable techniques are grounded in physical reality. The following sixth

grade students' comments describe the educational value of learning gardens as such:

It's about soil and science. We get to experience things. In class you get paper...

You learn about animals and plants, how to harvest, how plants take time to grow. [It is important] not just to go to the store and buy stuff. You get to see and know how plants grow...

In the gardens, we learn how not to fertilize, because it is not healthy to eat stuff that is artificially fertilized, it is healthier to eat organic.

The tempering and transformational qualities of experience are critical elements of an ecological perspective. The following eighth grade student's poem relates insights into the interconnected web of life that animates learning gardens.

Life

The sun powers the plants
 The plants are used by animals.
 The animals are used by us, humans.
 But when we die our bodies belong to
 the earth.

If you are not careful and you destroy
 one of these things you destroy the
 things that are in this cycle.

Insights such as those captured in the comments and poem above do not emerge from mental understandings alone; they are rooted in and nurtured by living experience.

Experience is not just about doing or hands-on learning. The ability to discriminate, make meaning, and learn is contingent upon pairing experience and reflection; this can teach a number of different ways of relating with life. For example, the same frost that kills some plants, such as pineapple sage, will ripen the fruit of others, such as persimmon. The occurrence of frost is neither good nor bad in its own right. Experience with it, paired with reflection, generates meaning and stimulates further questions such as: Why did one plant die and not the other? What makes persimmon ripen with frost, whereas other fruits need warmth to ripen? This experience presents a problem and contradicts what until this point might have been a taken-for-granted assumption that all fruit ripens with warmth; or that frost kills all plants.

TABLE 6.1 Seasonal garden curriculum

| <i>Grade</i> | <i>Fall Lessons</i> | <i>Winter Lessons</i> | <i>Spring Lessons</i> |
|------------------------------|---|---|--|
| 5th Adaptation and Diversity | <ul style="list-style-type: none">• Seasonal change & adaptation• Observation & sensory evidence• Decomposition• Creating a model• Energy Transfer• Diagramming life cycles• Conducting investigation | <ul style="list-style-type: none">▪ Fruits and roots (structure and function)▪ Dissection▪ Storytelling▪ Cooking and tasting▪ Photosynthesis▪ Dramatization of chemical change | <ul style="list-style-type: none">• Flowers and pollinators• Dissection and identification• Labeling a diagram• Pollination• Creating a model• Interdependence in garden environment• Observation and classification |
| 6th Life Science | <ul style="list-style-type: none">• Observe and categorize plant density and growth | <ul style="list-style-type: none">▪ Graphing▪ Two-dimensional geometry | <ul style="list-style-type: none">• Flowers, structure and function• Insects |
| 7th Physical Science | <ul style="list-style-type: none">• Physical and chemical properties• Compare types of energy | <ul style="list-style-type: none">• Physical and chemical properties• Name elements | <ul style="list-style-type: none">• Two-dimensional geometry• Estimation |
| 8th Citizenship | <ul style="list-style-type: none">• Writing modes and strategies• Identify audience and purpose | <ul style="list-style-type: none">▪ Advertising and persuasive writing | <ul style="list-style-type: none">• Educational signage and descriptive writing |

10

AWAKENING THE SENSES

[By] re-awakening our senses and intentionally honoring subjective experience [we] return to our essential, animal selves, the selves that evolved in relation to the non-human natural world ... our sensory systems are exquisitely evolved channels for translating between 'in-here' and 'out-there.'

(Sewell, 1995, p. 203)

It is important to listen to nature because nature is so beautiful to look at! Why shouldn't it be just as beautiful to listen to? Nature can be so beautiful to all of your senses if you just take the time.

(Student, Learning Gardens)

With a goal toward bringing life to schools, we can advance an ecological perspective through awakening and using the senses, including sight, sound, smell, taste, and touch—not just the eyes and ears. Awakening refers to enlivening the hitherto dormant senses such as smell, taste, and touch, and sharpening senses such as sight and hearing that are conventionally used in schools. Opening up and accessing the full range of sensory capacity can have a transformative impact in bringing life to school; learning gardens are naturally rich sites for sensory engagement, as they are filled with fragrant blossoms, thorny and prickly vines, delicious fruit, rustling leaves, and colorful flowers. In this chapter we elaborate a number of contributions the senses make to bringing life to an ecological education inspired by living soil as central metaphor.

Sensory Experiences with Soil and Learning Gardens

One of the rich lessons we glean from learning gardens is the value of slow and protracted observation over time for learning: we have seen children and youth

engaged with the living soil and vibrant life of learning gardens listen deeply to silence, observe plants with great detail, touch worms with uninhibited glee, and smell herbs in dreamy repose.

The ecological and pedagogical implications are substantial, as such sensory and experiential learning is often effective over long periods of time, thus contributing to academic achievement and positive environmental responsibility. Bringing life to schools through awakening the senses unblocks sensory feedback loops, and encourages creative rethinking of guiding metaphors. Nurturing all the senses in the physical reality of learning gardens brings life to schools in the following ways: invite presence; support reminiscence and memory; ground otherwise abstract learning; and reinforce the idea of interconnectedness. Below we briefly articulate each of these contributions.

First, sensory awareness invites us into the present moment, the here and the now, which is the only place and time in which we can effectively act, feel, communicate, teach, or learn (Abram, 1996; Rosenberg, 2003; Tolle, 1999). Within the modern Western context, it is common to think and act from the mind alone without regard for the role of the body or of the embodied senses. Our senses live in the physical body. For instance, it is possible to taste fresh fruit here and now. While it is possible to remember how a fruit might have tasted in the past, or predict how a fruit may taste in the future, we can only really taste, feel, smell, see, and hear fruit in the present moment. The same can be said of teaching and learning. While it is possible to have an abstract idea about the future or the past, this kind of knowing is divorced from the now. Awakening sensory capacity invites a return to the present moment and encourages engagement with life. Second, because memories are associated with bodily senses, not just with the mind, the taste of certain fruits may bring back memories of childhood or family histories. The flavors do more than stimulate and arouse specific taste buds; they create physical connections that sustain personal memories and generate spontaneous sharing of stories with potential to create community. Meaning-making can be deepened through sharpening the role of the senses in learning.

Third, engaging the full range of our sensory capacity helps to center awareness, and grounds abstract concepts within physical reality. This aspect ties together the previous six pedagogical principles of sustainability education discussed in earlier chapters. Our senses are what allow us to make meaning of curious experiences in place. Though abstract ideas can describe general concepts such as “sense of place,” grounded individual intimate presence is required to actually make sense of place; curiosity and wonder originate at least as much from sensory stimulation as from intellectual awareness. Awakening the senses encourages perception of less obvious natural rhythms and scales, and invites deeper respect for and valuing of the diversities that abound in an interconnected world. Practical experience awakens the physical senses in the most literal way. Finally, sharpening the senses reinforces in a bodily way the theme of interconnections that is characteristic of all living things. All of these themes are

interrelated, as the physical body is naturally here and now, it is not abstract, and it forms interdependent relationship with mind and nature.

The full range of faculties complements knowing through the eyes and ears and integrates diverse components of lived bodily experience: our senses take us beyond intellectual understanding, opening a door that connects the living world inside to the living world outside. What escapes conventional “knowing” can be understood experientially through connecting with a complete palette of senses. For example, the rustle of leaves on a cold autumn night, the smell of coming rain, and the feel of a shovel parting soft earth are the types of sensory experiences that connect us with the living world and communicate critical information that cannot be codified or reduced to the intellect. Likewise, our physical bodies regularly provide sensory information regarding our state of being through signs such as a pit in the stomach, an itch at the back of the neck, or tightness in the knee. Tuning into our vibrant sensory capacity brings us into the present moment; listening, smelling, tasting, touching, seeing, and feeling are all activities that can only be done right here, right now.

Our senses alert us to the existence of layered relationships and multidirectional connections with all living phenomena. Indeed, even our sensory faculties themselves act in dynamic ecological interactions with one another. For David Abram (1996), one cannot help but perceive interconnections if one lives in the present moment and attends to information absorbed through all sensory pathways:

A genuinely ecological approach does not work to attain a mentally envisioned future, but strives to enter, ever more deeply, into the sensorial present. It strives to become ever more awake to the other lives, the other forms of sentience and sensibility that surround us in the open field of the present moment.

(p. 272)

In modern Western culture, all too often we close down this vital stream of information and rely on our intellect and mind alone for understanding. In much the same manner that modern industrial culture ignores the role of relationship in maintenance of healthy ecological systems, a privileging of the mind, eyes, and ears overlooks the relationship between these and all other bodily ways of knowing. Our rich sensory capacity is a fundamental aspect of what makes us human and connects us with the more-than-human world. This dynamic energy is blocked by lifeless mechanistic metaphors and industrial models of education. Awakening the senses is key to engaging with the life-giving abundance characteristic of the natural world. Learning gardens on school grounds are accessible places for engaging and sharpening the senses. By becoming present to our senses, as Abram describes above, we embrace our humanity as an ecology of experience.

TEACHER, PRINCIPAL, AND SUPERINTENDENT PERSPECTIVES

In this chapter, we present perspectives and insights from three practitioners—a teacher, a principal, and a superintendent—who have intimate knowledge of and experience with gardens at their schools and/or districts. Our rationale for selecting educators at three “levels” of the school system is to show that at each level of the organization, there are educators who have a depth of understanding and knowledge of learning gardens as educational tools. Whether it is the classroom, the school, or the district, these individuals represent the voices of educators across the country where school gardens are designed, developed, and integrated with the curriculum. We have picked two school districts: Portland Public Schools with which author Williams has a 20-year history and where both authors have started and/or supported learning gardens in schools; and San Francisco Unified School District, which has a large percentage of schools with robust school gardens that have served as research sites for Williams since 2005. Both school districts are similar in size and have a large number of schools with learning gardens. They are both considered Title 1 school districts with over 40% of students on free and reduced school lunch and of non-white status.

We begin with Access Elementary School, a K–8 school on the Sabin campus in Portland Public School District, in north Portland in Oregon. In 2008, Sabin school’s vacant lot was transformed into a garden. By using this story, we demonstrate how learning gardens can be started and integrated with school curriculum. We requested third grade teacher Deziré Clarke to share her experiences since she had involved her students in building the gardens. More notably, as a teacher, she designed a garden-based curriculum and activities for ongoing engagement of her students. We requested that she use her teacher’s lens and perspective to explain the evolution of the garden and ways she and her students were engaged in the learning that occurred.

Next, we highlight a K–5 school, Lewis Elementary, in Portland, Oregon. Unlike Access Academy, this school is unique in that it has a 40-year history with outdoor learning that has seen waves of environmental interest. Yet, in the last decade, the school's garden program has been strengthened and serves as a site where visitors, both national and international, are inspired to see the vigorous parental and community-based support for the principal's vision of integrating their learning gardens into the broader ethic of sustainability that the school has embraced. Tim Lauer, the principal, shares his perspective as a school leader with a focus on partnerships which he views as critical to such ventures and school learning.

Finally, we present Superintendent Carlos Garcia's perspective on school gardens in San Francisco Unified School District and ways in which his district has created an infrastructure that continues to foster the building and integration of gardens in the San Francisco schools. Bonds passed in 2003 and 2006 included green schoolyards construction and the decade-old strong grass-roots support for gardens has been sustained.

We believe that the voices and insights of these practitioners will demonstrate in authentic ways how practice comes alive and will help move forward not only the creation of learning gardens on school grounds but also ways they are to be integrated to ensure that academic learning is promoted. Soil's living features can thrive in our schools when we value life-affirming language and practice at all levels—the classroom, the school, and the district.

Access (K–8) Academy at Sabin, Portland, Oregon

Sabin Community Native Garden and Sabin Edible Garden are the result of students, teachers, parents, and volunteers coming together from the Sabin neighborhood school community in Portland to bring vitality to the neighborhood and the school. Between 1990 and 2000, the enrollment at Sabin Elementary School (K–5) was declining. To avoid closure of the building, Access Academy (K–8) was started and housed in the building to serve gifted students in the Portland metropolitan area who performed at the 99th percentile level in nationally normed tests for aptitude and/or achievement in any or all of the following areas: language, math, or general intellect. The mission of Access is to develop a learning environment so that gifted children thrive socially, emotionally, and academically.

In May 2007, dozens of Sabin parents, teachers, staff, and neighbors laid the ground work to begin plans to convert a vacant lot at the school which had a bland expanse of unevenly growing grass into a garden. The north end of the school was selected since there was open space and sunlight and the area could be potentially fenced. The foundation was laid for the start of the Sabin Edible Garden with a view to making the space available for educating students at Sabin, Access Academy, and the Schools Uniting Neighborhood (SUN) schools program. SUN schools, a program for low-income students, operates both during

the academic year and also the summer; Valerie Thompson was hired as an AmeriCorp SUN staff and she joined Madelyn Mickelberry-Morris, hired by the Sabin Parent Teacher Association (PTA). The PTA comprised committed parents who wanted to revive the neighborhood through the garden program and provided financial support and human capital for the Sabin gardens. Over time, Isabel LaCourse was hired as coordinator. Besides vegetable, wildlife, and native garden beds, attractive benches and pavers for stone paths were constructed and placed in garden areas where there is ongoing development of beds and art and educational activities.

The schoolyard was transformed from a barren lot into an edible garden that was designed in the shape of a star with separate raised garden beds and barrels. Fresh vegetable starts went in, as well as fruit trees and berry bushes. Students, parents, and other volunteers spread donated cedar chips around the pathways to suppress weeds, maintain moisture for raised beds, and give the garden a beautiful and well-maintained appearance. As the garden began to become more established, the PTA identified the need for a Sabin Garden Committee to be responsible for allocation of resources, funding for projects and materials, garden maintenance, curriculum development for classroom use of the garden, long-term goals and vision, and the distribution of food grown in edible gardens.

As interest in the Sabin gardens grew, more parents with gardening, carpentry and construction skills volunteered. A beautifully designed iron gate was installed. Two cob benches were built with sand and straw with student involvement. Garden art made by students added color and beauty. The clay art was put in by Access Run for the Arts funds in 2009 with guest artist Sara Ferguson. In addition, on the south and west side of the school grounds, the new Sabin Community Native Garden received approximately 300 native plants and had pathways redefined with fresh bark chips.

The neighborhood takes pride in a learning environment that connects children to nature. Students harvest food that grows in the gardens and they are often outdoors learning about wildlife and nature. When the garden is hibernating, students plant cover crops to protect and enrich the soil and harvest hardy winter edible crops on a regular basis.

We invited Deziré Clarke, a third grade teacher from Access Academy, to share how she designed the curriculum and integrated the Sabin gardens in her teaching. The next section captures her philosophy of teaching and elucidates ways she spent a year involving third graders in learning in and from the school garden.

Ethnobotany: A Year of Schoolyard Learning—Deziré Clarke, Third-Grade Teacher

I would like to address who I am as a teacher and how I plan for my classes before I can talk about the garden program, since that will help with providing the broad