Copyright. Foodtank

From State Ideals to Local Realities: Implementation Barriers of Critical Environmental and Social Education at the Classroom, School, and District Levels

_____

Isaac Dalsheimer

Senior Comprehensive Project: Urban and Environmental Policy

Professor Shamasunder and Professor Cha

May 4, 2018

Table of Contents

Isaac Dalsheimer
UEP 411

Abstract

Public education policy in the US has systematically excluded environmental and social education as core academic and developmental priorities for its students. In response, a large body of critical pedagogical theory has emerged with the goal of influencing the country's educational community to prioritize environmental and social degradation in its formal instruction. The California Department of Education (CDE) has made strides to promote principles of critical pedagogy into its ethos across the state, but what are the avenues for incorporating critical pedagogy at the local level, and what barriers exist that inhibit educational programs of critical pedagogy from successful implementation? This research examines two successful case studies in LA County – a farm to school program in Pasadena and a green schoolyard project in LA – and aims to answer two research questions. First, do farm to school and green schoolyard projects fit within a critical pedagogical framework? And if so, what are the limits, barriers, and opportunities for implementing these projects at the local level? This research utilizes a dual-method, qualitative approach through expert interviews and document analysis of related educational materials. Findings of this research showed that both farm to school and green schoolyard projects are an effective means of promoting critical pedagogical practices, and that these models are viable options for schools and districts aiming to incorporate critical pedagogy. Research also showed that funding, professional training, privatization, stakeholder buy-in, education policy, department coordination, and maintenance remain as consistent implementation barriers for these programs despite the CDE's open support for such programs. The findings additionally highlight a series of specific implementation strategies for both farm to school and green schoolyard projects that can be pursued to overcome these existing barriers. This research adds to an existing body of literature covering the importance of critical pedagogies, as well as how to successfully implement them within the public school system.

Introduction

Remedying local, national, and global concerns surrounding social and environmental sustainability often leaves out widespread, public education reform as an effective means to this problem solving. In a national US climate of increasing social and ideological polarity, it has never been more important to come up with policy solutions to the interconnected trends of social and environmental degradation that affect us all – two long-term threats to sustainable human lifestyles. Throughout the 20th century, a large body of literature has shown that the academic goals of mainstream education have been largely determined by annual standardized test results and district accountability programs. Through this process, curiosity and inquisition from both students and teachers is stunted, depriving education of its roots in critical analysis and problem solving. The priorities of mainstream education policy neglect the vital importance of social cohesion and ethical treatment of the environment that are foundational to long-term human sustainability. Instead of these principles guiding education policy, they have been replaced them with a geopolitical 'learn to earn" framework rooted in a national agenda that aims to maintain competition in the global economy.

A variety of critical pedagogical theories have emerged in response to modern education practices, theorizing and researching the ways in which formal education and its assessment strategies can learn to incorporate these social and environmental concerns into curriculum and teaching practices during critical stages of social and cognitive development in children. Although theories of critical pedagogy have been developing for some time, empirical evidence and longitudinal studies showing the positive impacts of these educational models is yet to be incorporated into the pedagogies of every school. However, as social and environmental degradation persist, the time has never been more pressing to develop alternative educational

policies that adequately and effectively inform youth of the pressing social and ecological challenges our societies face. Critical pedagogical perspectives ask about the role of formal education as part of the childrearing process that occurs outside of the home. In light of these concerns, it is critical that education departments at the national, state, and district levels reflect on the means by *how* they are educating youth, and also *why* and for *what purposes* society should value childhood education on an ideological level.

California has become a leader in progressive policy on recent issues such as immigration, recreational cannabis, and climate change. In addition, California has made strides to alter education policy that adopts more critical environmental and social themes that relate to the current climate of environmental and social volatility. Extensive and compelling research on the positive developmental effects on children that come from critical pedagogical practices - such as increased academic performance, social skills such as empathy and emotional intelligence, critical thinking skills, mental and physical health benefits, and community cohesion - can be seen in new state-level initiatives, partnerships, and policy implementation that emphasize ecological and social cohesion. As the largest state in population, and the third largest geographically, California experiences unique challenges in the scope and intricacy of policy implementation. With this in mind, it is important to question whether or not these state-level policies and initiative realistically impact districts, schools, and even classrooms at the local level.

This paper will center around the successful implementation of two public school initiatives - a Los Angeles Unified School District (LAUSD) Green Schoolyard Project, and Pasadena Unified School District's farm to school (FTS) program. Although different in what they contribute to the educational experience of their schools, this paper will show that they

share a critical pedagogical perspective on developing environmental and social

literacy.   Through in-depth interviews with experts of educational programing and organization,

as well as through document analysis of literature related to both of these models, my research

will take a qualitative approach to address two primary questions. First, I will ask *how effective*

each model is in utilizing critical pedagogical practices, or in their potential to promote future

environmentally and socially centered programing? Secondly I will ask, *given the successes of*

these two programs, what are the thematic limits, barriers, and opportunities for successful

program implementation at the local level? These two questions are designed to explore the

relationship between state-level education ideals and the realistic ability of districts, schools, and

teachers to implement these ideals, and to act as a resource for future critical pedagogical

programing implementation.

The literature review of this paper will first look into the history of education policy in

the US and the standing practices of curriculum design and assessment. This history will inquire

into the ideological underpinnings of these practices, as well as the politics embedded within

them. It will then move into explaining a variety of alternative educational theories and practices

typically left of mainstream practice, and the possible developmental benefits that these

alternative pedagogical approaches can have on children - physically, mentally, and

emotionally. Finally, the literature review will focus on California's current initiatives, policies,

and partnerships that show the state's intention to reform public education in favor of

environmental and social sustainability concerns.

The findings of this paper were more limited than anticipated, and conversely not

conclusive for, or applicable to, all schools and districts in California. Even between LAUSD

and PUSD, significant differences in size, organization, and politics mean that the barriers,

limits, and opportunities of one cannot seamlessly be applied to the other. Despite this, research

findings from interviews and document analysis confirmed there were recurring and thematic

implementation barriers that exist across these two districts.   Although projects implementation

at each California district will necessarily be unique, consolidating and expanding on existing

literature of the successes and failures of the many different implementation efforts is important

in order to maximize successful future implementation for districts and schools that are keen to

pursue critical pedagogical practices for themselves. General recommendations for

implementation success will be made given these recurring themes present from these successful

case studies, however it should be noted that all recommendations recognize the geographic,

demographic, and political circumstances specific to each school and/or district that affect the

process of project implementation. More research and data collection must take place in

California to shed light on the fission between state-level goals and real-time, local opportunities.

Ultimately, this research will serve to illustrate the organizational, financial, policy, and

ideological hurdles that must be overcome in order for California public school districts to

effectively enact pedagogically critical programming that reflects the social and environmental

concerns of our time.

Literature Review

The Literature Review of this paper will begin by covering various forms of critical

pedagogical theory. These theories cover learning strategies and best practices that are

concerned with the holistic development of children. The critical pedagogical theories present in

this literature will focus on Social and Environmental education, with particular interest in

educating towards environmental literacy and social-emotional skills. the literature will briefly

cover psychoanalytic pedagogical theory for it's insight into the complicated psychological

component to childhood development. Theorists in this field believe psychoanalytic perspectives

should be applied to formal education practices, but that they have largely been neglected by the

educational community. The last few sections will highlight contemporary examples of critical

pedagogy as they appear in the literature, publications, and initiatives of the California

Department of Education, and subsequently where they appear at the local level in the Los

Angeles Unified School District. Literature concludes with a brief overview of public education

in the US, highlighting how critical pedagogical perspectives on environmental literacy and

social emotional development have largely been left out of formal instruction.

Critical Pedagogy of Place in Education

There is a growing body of research into a theory and practice of alternative educational

philosophy called critical pedagogy of place, in which existing, larger bodies of literature in

critical pedagogy and place-based education are joined (Gruenewald, 2003a, pg. 3). The

assumption underlying this model is that humans face unique social and ecological threats due to

a lack of formal education in how to nurture sustainable human relationships across diverse

experiences and perspectives, as well as the inherent relationship humans have with the earth as

our sustaining resource. Critical place-based pedagogues Lacey Huffling, Heidi Carlone, and

Aerin Benavides articulate that to achieve their educational goals to "increase environmental

awareness, contemplate the inherent value of the land, discover and celebrate the beauty and

strength in their community, and re-imagine local places," it is vital for curriculum to encourage

their students "to not simply consider their own perspectives and experiences but to continually

ask themselves: What perspectives, both human and non-human, are being silenced by my

perspective and or/experience?" They maintain that essential to this educational practice,

"Purposefully discussing the perspectives and experiences that are privileged in our re-imagining

of places can lead to a fuller understanding of the collective and can stimulate further discussion

surrounding the tensions between the land, the community, economics, and culture" (Huffing,

Carlone, & Benavides, 41-42). The emphasis on critical thinking of human/human and

human/ecological relationships is important to critical pedagogues of place because achievement

and assessment in mainstream education fails to account for the social and ecological quality of

community life. It is believed that social (Friere, 1970-1995) and ecological (Bowers, 1993)

sustainability should not be neglected in formal education, because they are ultimately the

foundation for which all other curriculum areas are relevant in the first place.

"People as beings 'in a situation,' find themselves rooted in temporal-spatial conditions

which mark them and which they also mark. They will tend to reflect on their own

"situationality" to the extent that they are challenged by it to act upon it. Human beings *are*

because they are in a situation. And they *will be more* the more they not only critically reflect

upon their existence but critically act upon it" (Friere, pg. 90)

There are a few glaring critiques of the practicality of place-based pedagogy that must be

addressed. First and foremost, due to the increase of standards and curricular restraints in many

schools, educators are not free to decide when and how to administer critical place-based lessons

(Schindel Dimmick, 2016). In essence, "classrooms are too regimented, curricular content is

dictated from above, and school boards, administrators, politicians, and other teachers still view

education in a traditional way" (Widdersheim, 2013). A second objection is that critical place-

based pedagogy poses a threat to the scale and quality of learning in other key subjects such as

math, reading and writing skills, science, and history due to their over-emphasis on the

identification and challenging of power relations in society (Widdersheim, 2013). Thirdly, the domain of Critical place-based education is young as a field, lacking the empirical evidence in case studies and longitudinal studies that illustrate the potential for its positive societal impacts (Gruenewald, 2003a; Widdersheim, 2013; Schindel Dimmick, 2016). Due to these three critiques, the field lacks concrete policy recommendations.

However, just because it is a young and evolving field of thought and practice does not mean that research and inquiry should halt. Leading thinkers in this field remind us that the principle goal of place-based pedagogy in its current state is as much to challenge the entire educational community to think more critically about the "assumptions, practices, and outcomes taken for granted in dominant culture and conventional education" (Gruenewald, 2003a, pg. 3), as it is to propose specific policy reform. Additionally important to note is that critical place-based theorists and educators do not want to get rid of all traditional standardized testing and classroom settings, but aim to bolster existing practices to incorporate certain missing elements that have been deemed vital for societal cohesion and efficiency by sociologists, psychologists, educators, and psychoanalysts alike. Ultimately, this pedagogy establishes that environment, culture, and education are all interconnected, and that critically examining place has the potential to act as a catalyst for debunking and reevaluating these cultural, political, economic, and ecological dynamics that are promoting unsustainable social (Maller, et. al, 2006) and environmental practices (Means, 2013).

The Ecological and Sociological Contexts of Critical Place Based Pedagogy

The Sociological Context

Critical pedagogues of place believe that assuming objectively measureable outcomes in standardized and narrow assessments of mainstream education fails to recognize the reality that

education is always political, and that human beings and their learning capabilities are inherently

informed by their cultural context (Gruenewald, 2003a, pg. 4). In the US, education policy is

political in the sense that curriculum is created to prepare "career-ready" citizens for a capitalist,

global economy - an educational agenda that leaves little room for ideological variance as

influenced by specific cultural contexts such as race, class, religion, and community ethics.

The multicultural argument for critical pedagogy is based in the assumption that patterns

of white-supremacy and colonization still exist within the dominant worldviews and the material

spaces of society. In essence, one of the primary goals of critical pedagogy is to provide critical

perspectives, allow for ample communication and reflection, and ultimately empower individuals

to "decolonize" themselves through synthesis of dominant language and inscribed material

spaces; subsequently reinventing their own meanings and definitions to fit their cultural context

(Friere, 1995; Haymes, 1995; Gruenewald, 2003a). To achieve this, curriculum of critical

pedagogy of place focuses on, "the importance of people telling their own stories (reading the

world) in a place where people may be both affirmed and challenged to see how individual

stories are connected in communities to larger patterns of domination and resistance in a

multicultural, global society (Gruenewald, 2003a, pg. 5).

The Ecological Context

There is an assumption in critical pedagogy of place that cultural analysis is necessarily

concerned with ecological systems. Gruenewald references the theoretical work of C.A Bowers

(2001) in outlining and promoting "eco-justice" as a critical framework for educational theory

and practice. Eco-justice has four main focuses: (a) understanding the relationships between

ecological and cultural systems, specifically, between the domination of nature and the

domination of oppressed groups; (b) addressing environmental racism, including the

geographical dimension of social injustice and environmental pollution; (c) revitalizing the non-commodified traditions of different racial and ethnic groups and communities, especially those traditions that support ecological sustainability; and (d) re-conceiving and adapting our lifestyles in ways that will not jeopardize the environment for future generations" (Gruenewald, 2003a, pg. 6). Mirroring the critical sociological perspective that the voice of marginalized people must be incorporated into the education practice as to enlighten students on human subjugation, so too must education reflect on how the subjugation of lands, resources, and ecosystems by the global economy and the daily practices of individuals perpetuate social inequalities.

The literature of ecological context extends from human oppression to the anthropocentric practices of society that allow for unethical treatment of the environment. Gruenewald articulates that although some theorists refute any "essential" or "homogenizing" relationship between human nature and the natural world, "place-based educators embrace this connection for a variety of spiritual, political, economic, ecological, and pedagogical reasons" (Gruenewald, 2003a, pg. 7). Woodhouse and Knapp (2000) isolate five characteristics of implementing critical ecological place-based education. They are: 1) It emerges from the particular attributes of place, 2) it is inherently multidisciplinary, 3) it is inherently experiential, 4) it is reflective of an educational philosophy that is broader than "learning to earn", and 5) it connects place with self and community. Through this practice, students of ecological place-based pedagogy are able to develop a personal stake in environmental degradation by recognizing their own contribution to ecological issues, as well as what they face losing as a result of ecological decline.

Critical place-based education allows individuals to better contextualize their own experience within their relevant spatial domains, and the existing social/political meaning

ascribed to those places (Haymes, 1995, pg. 3). There are a number of different educational

models that reflect, in one way or another, elements of critical place-based pedagogy, such as

experiential learning, contextual learning, problem-based learning, constructivism, outdoor

education, indigenous education, environmental and ecological education, bioregional education,

democratic education, multicultural education, and community-based education (Gruenewald

2003a, pg. 3). One drawback of critical place-based pedagogy is that too much emphasis on

place and relative, localized relationships may create a form of narrow provincialism in schools

due to its disproportionate focus on geographically near and personally applicable

lessons. However, the goal is in fact to use these place-specific experiences to inform a larger

inquiry into community, global perspectives, and the lived experiences of people from different

social and ecological contexts. Additional skepticism is found in areas of assessment and

achievement, and the lack of quantifiable measures for such relative, place-specific learning

experiences (Gibbs & Howley, 2000). Although this concern is valid, critical place-based

pedagogues attribute this gap to its relatively young field of implementation and research. As a

result, it is important to note that the primary goal in outlining this pedagogical alternative is to

challenge teachers and administrations on how to envision, for themselves, the ways in which

testing and assessment can account for the social and ecological quality of community life with

which critical pedagogues are concerned (Gruenewald, 2003a, pg. 10).

Psychoanalytic Pedagogy

Psychoanalytic research on human development and education provides on interesting

and robust critique of mainstream education, highlighting that measures of student and school

achievement do not consider the psychodynamic complexity of students (Mayes, 545). The

accountability and standardization assessments in mainstream education employ a behaviorist

pedagogy, meaning that schools and students are evaluated based solely off of observable actions and outcomes (Simply Psychology, 2007). For students, success is measured by standardized grading of homework, test scores, and classroom participation, and for schools and districts success comes from raising student achievement and bridging existing achievement gaps. It is true that behaviorist assessment strategies aim to be objective and can be useful to judge levels of understanding in certain subjects, however, because they are typically constructed is adherence with high-stakes standardization, they fail to acknowledge the complicated social, emotional, and psychological complexities present in individuals that have direct impacts on academic performance (Deringer, 2017). Anthony Deringer reminds us that success in school cannot be solely attributed to levels of effort put forth by the student, because the level of effort for two students coming from entirely unique psychological and social situations will never be the same.

The underlying assumption of psychoanalysts on education is that no two children are ever experiencing the classroom in the same way (Blos, 1941). It recognizes the complicated socialization that happens throughout the life of an individual and asserts that these experiences, "having shaped his psyche, will necessarily determine his emotional response to subject matter – the meaning it will have for him, his ability to accept it, and the purpose it will serve in his total development" (Mayes, 547). The psychological phenomenon of *transference* is the process by which individuals project "feelings, drives, attitudes, fantasies, and defenses" onto people and places that are displaced and inappropriately applied as a result of unconscious associations a person has with similar figures and places (Mayes, 542). These types of reactions manifest unconsciously in a person through what Freud articulates as "repetition compulsion", and are most common when involving authority figures and community dynamics – both relevant to classroom and school settings.

A major challenge in psychoanalytic education is that creating standardized curriculum and assessment strategies that are able to accurately account for the unconscious, individualized psychodynamic complexity of each student, and the communities that comprise school districts, has been too intricate at the national level because students are innately non-standard (Wildersheim, 2013). However, where psychoanalytic pedagogy is constructive is in highlighting the general neglect of students' emotional, socialized realities within behaviorist pedagogy and the standardized assessment tools that measure academic success (Mayes, 2009). The goal of psychoanalytic theory in this paper is not to discount testing and standardized assessment outright, but rather to present aspects of student potential that are neglected and their resulting implications on child development.

Behaviorist pedagogy operates within an ideal of objective transfer of information between teachers and students. However, official standardized curriculums are always operationalized by the teacher in his/her own way, which ultimately imbeds subjectivity to each classroom's academic environment.   The teacher's own social politics, the way he/she acts in a position of authority, his/her communication skills, his/her level emotional intelligence, and other pedagogical approaches all combine to complicate the way culturally and emotionally unique students receive and process curriculum content. The student/teacher relationship is full of these nuanced social interactions, which have an impact on any intended objectivity that a standardized curriculum may have. In his literary research on psychoanalytic perspectives on teaching and education from 1922-2002, Clifford Mayes concludes that among all psychoanalysts concerned with education, the single most recurring priority in almost one hundred years of psychoanalytic research is the need for meaningful and nurturing relationships in the lives of children (Mayes, 540). His lengthy literature review illustrates this to be

fundamental to psychic stability and academic performance, and highlights its absence in mainstream education. Certainly teachers, students, and policy makers all recognize the inherent social nature of schools, however there are no formal lessons at the level of national education policy on how to communicate with others and how to employ critical social awareness, such that the cultural and emotional specificity of each individual is acknowledged and validated in the classroom. Kirman (1977) compares this by stating that in the best child-rearing practices in the home, "there is no artificial separation of the emotional and the intellectual. Neither should there be in the classroom." An additional perspective by Greenspan (1989: 239) reminds us that "emotional, social and cognitive learning must be viewed as occurring together," and that education programs should support each of these pillars of related "intelligence."

The difference between mainstream education and psychoanalytic perspective is in the way they define education. For the psychoanalyst, arguably the most attuned academics to the psycho/emotional needs of people, the primary psychic imperative is maintaining "the cohesive self" (Mayes, 561). Here, cohesion means the balanced relationship between humans' inherent cognitive and emotional needs. In conclusion, the psychoanalytic critique is that mainstream education policy and resulting curriculum design is defined primarily as the molder of working professionals within a global, capitalist economy. The alternative definition and goal of education held by most psychoanalysts is that education should be concerned with developing the total psycho/emotional character of students, such that they achieve their most cohesive, authentic self. There is an underlying assumption that humans are more than working professionals, and that the personal lives, mental and emotional health, and social understandings of people have direct impacts on psycho/emotional health and productivity. The implication of

this is that any social collective, at the school level or extrapolated to a societal scale, is arguably

better off with a more psycho/emotionally healthy and productive citizenry.

Self-Concept and Academic Achievement

Enthusiasm, engagement, and willingness to learn are qualities that maximize academic

achievement, the same way that boredom, disengagement, and discomfort negate from high

performance (Mora, 2011). A main challenge faced by educators and curriculum builders is that

these relationships to school are often influenced by unconscious emotional dispositions. Some

psychoanalysts refer to 'self-esteem' as an underutilized tool in maximizing academic

performance, for its ability to enhance enthusiasm, engagement, and willingness to learn. High

levels of self-esteem in students have been shown to boost intellectual curiosity and creativity,

illustrating the subtle relationship between thought and emotion and their combined impact on

academic performance (Mayes, 548; Trautwein, 2006). Accounting for variance in

Psycho/emotional states such as self-esteem and trauma, however, are not goals of mainstream

education as evidenced by policy and assessment strategies of behaviorist pedagogy. In many

cases, the reality is that self-esteem is often dictated by external and unconscious experiences of

which people cannot be held accountable. In a standardized testing system, measures are not

taken at the institutional level to reconcile these disparities in students. These questions become

particularly compelling when contextualized in the lived experiences of marginalized and

oppressed peoples of the United States as factors that perpetuate systems of inequality. This will

be discussed later in more detail.

In another example, a mixed method, cross-cultural study was conducted by researchers

at Bowling Green State University with the goal of highlighting potential correlation between

self-esteem and academic achievement. Looking at 86 North American (USA) and 86 British

11-12 year-old adolescents, researchers collected and synthesized qualitative data of students'

academic performance in relation to qualitative interviews and observations on the way students

expressed academic and social self-concept. What they found was a positive correlation in both

countries between standardized test scores and how students commented on their academic

ability and role as a student. The subject where this was most clear was in math, where the *best*

groups in this subject positively spoke about their academic selves in both semesters of school,

while the *worst* groups in this subject avoided talking about their academic selves. By the

second semester, the *worst* math performers in both countries fully stopped making academic

comments about themselves. This evidence points to the potential need to prioritize positive

social and academic self-concept in students, which are shown to be linked with test

performance; in particular math.

Evidence of Critical Pedagogical Perspectives in California

Somewhat optimistically, the California Department of Education (CDE) has adopted a

more critical pedagogical stance over the last decade on environmental and social sustainability,

with practices, statements, and increased resources directed to supporting and aiding districts in

reforming mainstream education in the state. This is shown through California's Local Control

and Accountability Plan (LCAP), which provides Three particular interventions have taken

place within the CDE that mark this transition, the adoption of Next Generation Science

Standards, the publication of the California Environmental Literacy Blueprint, and joining the

Collaborating States Initiative to build strong Social Emotional Learning in schools across the

state. If not for concrete curriculum and program implementation, at the very least these three

initiatives illustrate a changing view on the role of formal, public education in rearing more

environmentally and socially literate citizens.

Next generation Science Standards

The incorporated Next Generation Science Standards (NGSS) in the CDE are compatible with existing Common Core State Standards (Conceptual Shifts, 2013), however they have a few key conceptual shifts from previous science instruction that have positive implications for critical environmental and social pedagogies. The first key shift is that understanding *and* application must be intertwined for the most effective and contextual learning experience. Similarly, the NGSS states that, "It is important that teachers and curriculum/assessment developers understand that the focus is on the core ideas—not necessarily the facts that are associated with them. The facts and details are important evidence, but not the sole focus of instruction" (Conceptual shifts, 2013). This recognizes the historical shortcomings of standardization practices that have left students memorizing, rather than applying and contextualizing, their acquired knowledge from school. The most important shift to affect pedagogical practices at the district level is that NGSS are performance expectations, and not curriculum. This is not intended to limit instruction, but rather grant districts and schools freedom to create curriculum, units, and lessons that more accurately meet their specific needs. Whereas earlier science standards limited local efforts to modify and/or implement new programs and curriculums, the NGSS now provides pedagogical agency to districts and schools. As a caveat to these new standards, the NGSS website notes that "Additional work will be needed to create coherent instructional programs that help students achieve these standards" (Conceptual shifts, 2013).

California Environmental Literacy Blueprint

In 2014 the Superintendent of Public Instruction for the CDE, Tom Torlakson put together a 47-member task force to assess the state of environmental education in California and to come up with recommendations to improve environmental curriculum and programing. The

result was a robust 45-page Environmental Literacy Blueprint with the purpose of guiding

schools within the CDE to educate students on the knowledge and skill-sets around current

environmental issues and future environmental crisis prevention. Although this Blueprint is non-

binding, it details a vision for an environmentally literate California citizenry that is backed by

both the Governor Jerry Brown and supported by 89% of Californians (Environmental Literacy

Blueprint, 2014). The following excerpt states the future goal as articulated in the Blueprint:

> Environmental literacy embedded into formal instruction for History-Social
> Science standards, and as part of CA CCSS (CA Common Core State Standards)
> and CA NGSS implementation. This is strengthened by meaningful learning
> experiences that build environmental literacy in nature; on school grounds; in the
> local community; in residential outdoor science programs; and in museums,
> aquariums, science centers, etc. (A Blueprint for Environmental Literacy, 2015)

Beyond just highlighting this new state goal, the task force responsible for the Blueprint

lays out six key strategies for implementing environmental literacy at the local level. The

publication clearly states that much work must be done to effectively achieve the Blueprint's

goal, and that environmental literacy cannot be a stand-alone subject. It must be fully integrated

into the framework of all subjects, as stated in the above "future goals". The following six

strategies are designed to target the current systemic barriers that inhibit the comprehensive

integration of this Blueprint:

1. Integrate Environmental Literacy Into Existing and Future Education Initiatives
2. Strengthen Partnership and Collaboration Amongst Key Stakeholders
3. Mobilize the Public and Leverage the State Superintendent of Public Instruction's (SSPI) Influence.
4. Implement Select Changes to Relevant State Law and Policy
5. Ensure Implementation through Capacity Building and Continuous Improvement
6. Develop a Sustainable Funding Strategy

Each of these strategies is broken down into subsections, highlighting that each strategy

is multi-layered and requires dynamic solutions. They outline an avenue for building a dynamic,

statewide education system that integrates environmental literacy into both the CA CCSS and CA NGS.

California Department of Education and Social and Emotional Learning

The California Department of Education (CDE), in conjunction with environmental literacy goals, has made further efforts to formally educate the holistic development of the child through Social Emotional Learning (SEL) initiatives. In 2016 (State Superintendent Tom Torlakson Announces Launch of #GoOpen Initiative and Collaboration in Common Professional Learning Community, 2016), the CDE became one of eight states to join the Collaborating States Initiative, created by the Collaborative for Academic Social and Emotional Learning (CASEL). The goal of this group is to "share information, best practices, and promising tools and ideas in the interest of building strong Social Emotional Learning in Schools across their states" (Social and Emotional Learning - Initiatives & Programs [CA Dept of Education]).

Echoing a similar vision from that of the Environmental Literacy Blueprint, the CDE's press release regarding this initiative is concerned with broadening formal and mainstream education practices with the holistic development of children (State Superintendent Tom Torlakson Announces Launch of #GoOpen Initiative and Collaboration in Common Professional Learning Community, 2016). The CDE's executive department articulates that although "teachers instinctively know that social and emotional skills are important, historically schools have been primarily focused on teaching academic content such as reading, math, science, and history, and less intentional about supporting the social and emotional skills that are so important to learning and life success." Superintendent Torlakson has urged educators from across California to join Collaboration in Common - an online platform that allows educators from across the US to share tools, resources, and professional development skills freely, without cost

or violating copyright laws (State Superintendent Tom Torlakson Announces Launch of

#GoOpen Initiative and Collaboration in Common Professional Learning Community, 2016).

Inspired and informed by a growing body of literature on Social Emotional Learning, the

CDE recently published their own document of Guiding Principles this year (California's Social

and Emotional Learning: Guiding Principles, 2018). Similar to the Environmental Literacy

Blueprint, these SEL guidelines are not mandatory for teachers, schools, and districts, but highly

encouraged. Additionally, California's current 3-year Local Control and Accountability Plans

(LCAP) policy works in favor of these SEL guidelines, which would allow local education

agencies (LEAs) to implement SEL in accordance with the specific, local needs of their schools

(Local Control and Accountability Plan (LCAP) - Resources). The guidelines of this publication

articulate five Principles that aim to provide "an equitable, culturally responsive education;

academic, social, and emotional learning; safe, engaging, inclusive environment" to support

"every child's unique journey to fulfill their potential" (California's Social and Emotional

Learning: Guiding Principles, 2018).

Evidence of New Pedagogical Perspectives in Los Angeles

At the local level, Los Angeles Unified School District (LAUSD) has sustained and

created new programs and initiatives that echo environmental and social priorities of the

CDE. The LAUSD Sustainability Initiatives Unit, established in 2008, hosts four main goals

(Campus Ecology LAUSD) that have implications for two crucial components of childhood

education - the built environment of schools and academic curriculum design and instruction.

These goals are:

1. Increase campus green space, school gardens, and outdoor learning spaces
2. Increase permeable surfaces to encourage groundwater infiltration
3. Reduce heat-island effect
4. Raise awareness of environmental stewardship and urban habitat

Some of the initiatives that reflect these goals related to education and childhood development in LAUSD are the Sustainable Environment Enhancement Developments for Schools (SEEDS) Program, Local District Northwest Environmental Sustainability Challenge, Nutritional Ed/Obesity Prevention (NEOP) Learning Gardens, Nature Explore Classrooms, and the National Wildlife Federation Schoolyard Habitats. What connects each of these LAUSD initiatives is a goal to redefine urban landscapes to be more ecologically sustainable and to develop environmental literacy in students through regular exposure to the outdoors.

A significant component to the longitudinal success of these initiatives comes from the availability of sustaining educational and professional development resources and policy to protect them from. In regards to school gardens, a 2007 ordinance was passed in the district that preserved and sustained any school garden that had pedagogical, ecological, and developmental benefits in schools (Preserving and Sustaining School Gardens, 2007). In the following year, LAUSD published a instructional toolkit for district educators that instructed on how to incorporate school gardens into curriculum (Using School Gardens as an Instructional Tool, 2008). These efforts reflect what should be a growing commitment to maintain and build upon more environmentally and socially critical pedagogical practices in LAUSD.

Mainstream Education in the US

The pedagogy and implementations of the Elementary and Second Education Act (ESEA) of 1965 is the contextual starting point for this research paper. It is important to establish and understand the ways ESEA is implemented and guided by certain pedagogical approaches as to be able to isolate certain flaws and shortcomings in policy implementation that should be addressed and remedied in the US. Broadly speaking, the US has a history of having large performance gaps between schools, and perpetuating these gaps through reward systems (Sala &

Knoeppel, 2015). High performance is rewarded with increased funding as a result of state-run

accountability programs, while poor performance creates disinvestment and perpetuates poor

teacher, student, and administrative performance. A myriad of compounding social and

economic factors contribute to this achievement gap between school, yet educational policy

reform has failed to recognize these factors to the extent necessary to ensure an equitable

potential for institutions to succeed. This research, although related to these systemic issues,

serves primarily to analyze pedagogical approaches and curriculum design in isolation from

concrete policy recommendations, although implications to future policy is relevant and will be

postulated. These larger systemic issues require comprehensive research and subsequent policy

recommendations beyond the capacity of this paper. The goal however, is that research findings

on the nuanced dual-impacts of curriculum and pedagogy may inform future policy on how to

remedy both the performance gap of institutions and the personal development of

psychologically and culturally complex students who are often disadvantaged in standardized

education practices.

To begin, it is important to note that curriculums of public education and the established

dominant pedagogies that guide them are situated within the social and bureaucratic context of

the US government. From this critical understanding of education policy, exploring research and

theories of alternative pedagogical approaches can be assessed for their possible role in

bolstering the ESEA to include a more holistic vision of child development.

The ESEA has remained the foundation for recent education policy reform by presidents

George W. Bush and Barack Obama. The Bush administration's, No Child Left Behind Act

(NCLB), implemented in 2002, and the Obama administration's, Every Student Succeeds Act

(ESSA) of 2015, both canonized math and language arts as top priorities of public education in

the US. These policy measures adhered to existing educational traditions to prepare students for career and technical education (CTE) programs in adulthood (Kymes, 2014), ultimately guiding the academic and professional trajectories of youth to fit a national agenda of specific economic and political needs. The structure and goals of dominant education must be contextualized within the dominant social and economic role of the US within the global economy. As articulated by Gibbs and Howley, "In powerful countries like the United States, the imperatives of the global marketplace increasingly came to influence thinking about how to prepare the nation and its citizens for the complex demands of an interdependent, yet increasingly competitive economy" (Gibbs & Howley, 3). There is pressure on the US government to produce an efficient and competent workforce in certain curriculum areas that cater best to the necessary professions of a global, capitalist economy. Although the NCLB and ESSA Acts are nuanced in their policy implementation, they both utilize accountability programs and standardization practices that promote a "one size fits all" approach to incredibly diverse social, economic, and geographical contexts across the country (Sala & Knoeppel, 15).

Practices of Standardization and Accountability

Public schools in the United States are primarily organized on the state level, but federal education policy ultimately determines the educational goals of state policy. The underlying principle of the US Department of Education is to prepare students for increasing global competitiveness (Every Student Succeeds Act, 2015). The standing education policy in the US, ESSA, maintains this principle and calls for increased "world-class" standards of achievement for all students as to compete with other nations in areas such as college attendance and completion. These increased standards are reflected in annual statewide, standardized assessments that students take. These tests are the hallmark of standardization that the US

employs to monitor how schools, districts, and states are doing in preparing students for the global standard. These standards are also the metrics by which students are deemed successful or not, with real longitudinal implications in regards to higher education attainment, job security and quality, and income. The question at hand is that if these standards do not equitably acknowledge the complex psychological and cultural needs of all students, then how can we expect large-scale academic success across these student differences?

In conjunction with standardized assessments, the ESSA includes the traditional accountability system in which schools are rewarded for increasing student achievement and bridging achievement gaps, and districts and states are rewarded for turning around their lowest performing schools (Accountability: ESSA, 2011). This reward system puts pressure on schools, states, and districts to prepare students to perform for the test, which manifests in the creation of specific curriculums designed for test success and subsequent federal funding as part of the accountability system.

Instituting a high-pressure schooling environment incentivizes teachers and administrations to do whatever necessary to achieve their goals and maintain their jobs and status (Berliner, 289). In US public schools, perhaps the most common way to compensate for the pressures of testing and accountability is through curriculum narrowing (Common Core, 2012). This practice occurs when curriculum distribution often shifts to disproportionately emphasize certain disciplines - in the US principally Math and English/language arts – that will appear on annual standardized exams. Research illustrated in Tables 1 & 2 was collected from surveys administered to a nationally representative sample of approximately 500 school districts, and refers to primary grades only (Berliner, 289).

Table 1. Changes since 2001–2002 in instructional time for elementary school English language arts and mathematics, in districts reporting increases (McMurrer, 2008).

Subject matter examined	Average total instructional time spent pre-NCLB (in minutes per week)	Average total instructional time spent post-NCLB (in minutes per week)	Average increase in instructional time per week (in minutes)	Average increase in instructional time as a percentage of total instructional time
English language arts	378	520	141	47%
Mathematics	264	352	89	37%

Figure 1.

Figure 1 shows the increase in time spent dedicated to math and English in curriculum, and its correlation to more rigorous testing standards as part of the No Child Left Behind Act. Conversely, Figure 2 shows a decline in time spent in other disciplines not essential to testing over the same one-year period.

Table 2. Decreases in instructional time for various curriculum areas to accommodate increases in time for English language arts and mathematics (McMurrer, 2008).

Subject matter	Average minutes per week before NCLB	Average minutes per week after NCLB	Average decrease per week	Average decrease as a percentage of total time per week
Social studies	239	164	76	32%
Science	226	152	75	33%
Physical education	115	75	40	35%
Recess	184	144	50	28%
Art and music	154	100	57	35%

Figure 2.

Social studies and Science are the two areas shown to have the largest decrease in time offered per week. When school funding and job security are on the line for educators and administrators as part of the accountability program, curriculum narrowing becomes a logical and concerning tactic. Another comprehensive survey study conducted by the Farkas Duffett Research Group of teacher perspectives showed that 93% of respondents believed the root cause of curriculum narrowing was standardized testing pressures (Common Core, 2012). Furthermore, survey data indicated the same effects as shown in Tables 1 & 2 – that curriculum narrowing tactics are employed at the expense of other curriculum areas. The

surveys, published by Common Core, also show that 83% of respondents agreed with the statement that electives, classes in the arts, free time, and other diminished subjects "give students something to look forward to and are essential for a well rounded education" (Common Core, 2012).

A more theoretical perspective on accountability and testing is posited by David A. Gruenewald, who argues that even more concerning than curriculum narrowing is that standardizing achievement completely neglects larger cultural contexts such as race and wealth disparities among not just students but also districts with different socio/economic demographics. He writes, "The pressure of 'accountability' and the publication of standardized test scores in the news media reinforces the assumption that student, teacher, and school achievement can be measured by classroom routines alone, and that the only kind of achievement that really matters is individualistic, quantifiable, and statistically comparable. Such an assumption is misleading because it distracts attention from the larger cultural contexts of living, of which formal education is just a part" (Gruenewald, 2003b). Standardization is not only cutting out certain disciplines, but it is neglecting the cultural contexts of students, teachers, and communities.

Methods

This research methodology was concerned with classifying farm to school programs and green schoolyard projects within a critical pedagogical framework, and with assessing the division between state-level educational goals and program implementation capacities at the local LAUSD and PUSD levels. To satisfy these goals I employed a two-fold qualitative approach by collecting and synthesizing interviews and educational documents. A qualitative

assessment was preferred because of the multi-layered and complex relationships between California Department of Education (CDE) policy, local resources, socio/economic factors, and public interest that combine to affect the practical implementation of programs in public schools. My methods examined two successful case studies in LA County public schools that have employed critical pedagogical practices - PUSD's farm to school program and Eagle Rock Elementary's green schoolyard initiative. The successful farm to school program in PUSD and green schoolyard initiative in LAUSD were chosen because they were both considered exemplary models within the larger movements of each initiative. To clarify, this dual methodology first determined whether or not these two case studies successfully fit within a Critical Pedagogical Framework (Figure 4) to see if, and to what extent, they should be modeled for future schools and districts seeking to incorporate pro-environmental and pro-social pedagogies. Second, interviews and document analysis about these two models were synthesized to isolate the thematic barriers, limits, and opportunities of implementation.

Participants

This research consisted of four semi-structured, in depth interviews with experts of program implementation who work in, or with, PUSD and LAUSD. These experts were selected because of their experience with curriculum design, curriculum and program implementation, education policy, and district organization in PUSD and LAUSD. More specifically, these interview subjects had worked either on implementing and/or modifying the PUSD farm to school program and Eagle Rock Elementary's (LAUSD) green schoolyard project. Interview subjects were assumed to be familiar with the critical pedagogical impacts of these programs as a result of their experience with these models. Interviews lasted between thirty-minutes to one hour. Participants were contacted through resources at Occidental College and through publicly

available contact information online. Interview subjects participated voluntarily and consented

to the publication of their responses. *Figure 3* provides the names, position, district, and

program affiliation of interview participants.

Name of Interviewee	Title/Position of Interviewee	District Affiliation	Program Affiliation	Date of Interview
Bevin Ashenmiller	Environmental Economist	LAUSD	Eagle Rock Elementary Green Schoolyard	February 2017
Katia Ahmed	Farm to School Coordinator	PUSD	PUSD Farm to School Program	March 2018
Rosa Romero *(joint interview with Sharon Cech)*	Farm to Preschool Program Director at the Urban & Environmental Policy Institute (UEPI) at Occidental College	PUSD & LAUSD	PUSD Farm to School	February 2017
Sharon Cech *(joint interview with Rosa Romero)*	Leader of CA Farm to School, Farm to WIC, and Regional Food Systems programs at UEPI	PUSD & LAUSD	PUSD Farm to School	February 2017
Steve Zimmer	Former Director of LAUSD School Board	LAUSD	N/A	February 2017

Figure 3.

Materials

After agreeing to participate, interviewees were provided with IRB informed consent

forms at the time of their interviews. Consent forms included information about the purpose of

the research, the intended use of research findings, contact information for future inquiry about

the research process, and the potential of risk both professionally and personally through the

publication of their responses. These forms granted participants anonymity and confidentiality if

desired. Written versions of the interview questions were provided to participants before the

interviews began to ensure participants were familiar and comfortable with the research content.

Mobile phones were used to record these sessions, and informal notes were taken during

interviews to further document their responses. Interview recordings were transferred to a

computer following the sessions and subsequently transcribed to ensure analysis of interview

responses was as accurate as possible.

Using existing literature on critical pedagogies presented in the literature review, I

created a framework of critical pedagogical practices and educational goals to show the ways

that farm to school and green schoolyard initiatives fit into the critical pedagogical

framework. This framework (Figure 4) consolidates repeating themes within different critical

pedagogical theories, but only includes themes related to environmental and social concerns. A

successful adherence to this framework of farm to school and green schoolyard analysis would

suggest that these models should be pursued as valuable critical pedagogical opportunities at the

local level, with a focus towards promoting pro-environmental and pro-social behavior.

<u>Critical Pedagogy Framework</u>
Emphasizing Social-Emotional Learning in Formal Lessons and Instruction
Promotes Community Building and Collaboration Among Students, Teachers, and the Surrounding Community
Utilizes Place-Based Learning
Educates Towards Environmental Literacy
Promotes Empathy, Awareness, and Equity Towards Socio/Economic Inequality

Figure 4.

The documents analyzed for this research consisted of books, toolkits, reports, fact

sheets, press releases, reviews, research, and mission statements from leading organizations of

both the farm to school and green schoolyard movements. Documents related to the farm to

school model were accessed through the National Farm to School Network and the California

Farm to School Network, while documents for green schoolyards was accessed through Green

Schoolyards America and the Children and Nature Network. The majority of these documents

were publicly available online.

Design and Procedure

To isolate the real-time barriers, limits, and opportunities for implementing

environmentally and socially critical curriculums and programs, this research needed to examine

successful initiatives in California public schools. Analysis of successful programs was

preferred because it not only allowed me to isolate the limits and barriers they faced, but also

how they were able to overcome them. It should be noted that the implementation mechanisms

between the two case studies used in this research were different, however they are

pedagogically similar in that they both promote pro-environmental and pro-social curriculum

consistent with critical pedagogical theories. Additionally, these two models were selected for

their placement within densely urban school districts and for their demographic

compositions. Critical pedagogies are particularly concerned with urban settings as they often

reflect social and ecological issues most severely (Stevenson, 2008; Gruenewald, 2003a,b;

Haymes, 1995).   All synthesis and coding of interviews and educational documents was done by

hand.

In-depth interviews were conducted in person, over the phone, and through written

responses, depending on the availability of each participant. The interview questions for each

participant specifically reflected their individual expertise, but specifically targeted within the

their work with the farm to school and green schoolyard case studies.

Document analysis of literature relating to farm to school models and green schoolyard

initiatives was a necessary second form of qualitative data collection to corroborate and bolster

the interview responses. Interviews alone were not robust enough to show themes in the limits,

barriers, and opportunities of project implementation at the local level.

Findings and Analysis

Pedagogical Assessment

Through analyzing documents and literature about the educational strategies, pedagogical

intentions, and child development benefits of green schoolyards and farm to school programs, I

found that they effectively and robustly employ critical pedagogies centered on environmental

and social sustainability concerns. Interviews further confirmed these findings. When compared

against the Critical Pedagogy Framework (Figure 4), both models met each of the five criteria

presented in the framework – five of the more central themes across a number of critical

pedagogical theories that was established through extensive literature review.

Figure 5 on the following page represents these findings in summary, and can be

referenced for the remainder of this paper while interview responses and document analysis are

discussed in more detail. It should be noted that the six components of the critical pedagogical

framework are intersectional often reinforce one another. As such, this concise table is limited in

expressing the layered pedagogical impacts of these two programs. The written findings and

analysis following Figure 5 detail the specifics ways in which each program meets this

framework, and should be utilized to clearly understand the contents of Figure 5.

Framework	PUSD Farm to School	Eagle Rock Elementary Green Schoolyard
Emphasizes Social-Emotional Learning in Formal Lessons and Instruction	• Increases academic interest, self-esteem, enthusiasm, classroom participation, and work ethic. • Enriches social interaction in areas of trust, affection, and teamwork.	• Reduces stress, boredom, aggression, and bullying • Increases cooperation, responsibility, confidence, and self management.
Promotes Community Building and Collaboration Among Students, Teachers, and the Surrounding Community	• Engages local food and agricultural industry. • Stimulates local agricultural economy, • Increases involvement from faculty, parents, and other stakeholders of the school/district.	• Emphasizes participatory design from administration, faculty, students, families, and community partners. • Promotes joint-use public spaces between schools and the surrounding community.
Utilizes Place-Based Learning	• Opportunities for experiential learning, outdoor education, ecological/environmental education, community-based education, bioregional education, contextual learning, and problem-based learning.	• Opportunities for experiential learning, outdoor education, ecological/environmental education, bioregional education, contextual learning, and problem-based learning.
Educates Towards Environmental Literacy	• Educates on soil, water cycles, seed cycles, biodiversity, and resource management. • Educates on the environmental implications of our food systems. • Connects the built environment with the natural world.	• Promotes lessons of stewardship. • Educates on ecological systems present in the yard. • Connects the built environment with the natural world.
Promotes Empathy, Awareness, and Equity Towards Socio/Economic Inequality	• Positive mental, physical, and academic health impacts. • Goal of equitable childhood development. • Prioritizes implementation in high density, low-wealth urban neighborhoods.	• Provides access to healthy foods, exposure to nature. • Positive mental, physical, and academic health benefits. • Goal of equitable childhood development • Prioritizes implementation in high density, low-wealth urban neighborhoods.

Figure 5

Promotes Community Building and Collaboration Among Students, Teachers, and the Surrounding Community

Green Schoolyards

Community engagement consistently recurs as a guiding principle of a successful green

schoolyard project in both interviews and literature. Community engagement is a key feature to

critical pedagogy because of its potential to create social networks and increase daily interactions

of community members who live in the same places. In one publication from Green Schoolyards

America, one of the organizations leading the national movement, they articulate how successful

green schoolyards should be collaborative efforts, stating:

> Successful green schoolyards are the product of many hands that harness the
> collaborative potential of their school communities. Like the barn raisings of
> previous generations, this cooperation among community members reinforces
> interdependence, local self-reliance, and a 'sense of community, creating useful,
> beautiful places at very low cost. When parents, teachers and students work
> together to improve their school and grounds, they foster closer relationships
> that in turn support student achievement and wellbeing. This movement shifts
> the way our society views these important, shared public spaces, and supports
> school district land management efforts with the energy of community partners
> (Danks A, 2014)

Although the degree to which green schoolyards can engage its many stakeholders in

administration, faculty, students, families, and community partners simultaneously will vary

depending on the specific project and design of the schoolyard, it is clear from this quotation that

it is intended to strengthen citizen participation in creating public spaces. This effort increases

social contact between stakeholders, but more importantly it does so by connecting people with a

shared interest, concerned with enhancing the academic experience of community youth,

promoting their mental and physical health, and beautifying their communities public spaces

(schools). When people participate in the conceptual and physical creation of projects, they

develop a stake in the success and longevity of those projects.

The Children & Nature Network expands even further on the importance of community in green schoolyard campaigns, by highlighting a growing trend in municipalities to co-locate schools and parks (Building a National Movement, 2016). These "shared-use" or "joint-use" spaces have the potential to uniquely bridge community and educational goals, and are of particular interest in dense, urban settings where green space is limited and/or nonexistent. From the perspective of critical pedagogy, utilizing schools as a strategy for greening the built environment of urban communities also instills awareness in the children who utilize those spaces on a daily basis of their value in enhancing quality of life in urban neighborhoods. Linking neighborhood and educational interests has the potential to strengthen citizen engagement with the quality of public school developments, and investment in the policy and development strategies that determine these built environments in which they interact.

I also found that two of Green Schoolyard America's specific pedagogical goals of the community engagement process in green schoolyard creation are Empowerment and Stewardship. When the successful creation and implementation of green schoolyards is driven and celebrated by the larger community as it should be in theory, students are provided a personal experience of how "collaborative environmental action leads to clear, positive results that counter Ecophobia and build our confidence in the power of working together – sending messages of optimism and hope to children and adults alike" (Danks B, 2014). Engaging children in community development strategies has clear and direct implications to the critical pedagogical concerns of community engagement that is typically lacking in mainstream education practices.

A final excerpt from *Asphalt to Ecosystems* further illustrates the intentions of a green schoolyard's model to involve community. it reads:

> The strongest ecological schoolyards usually arise from a participatory design process that reaches consensus about future goals and priorities of the grounds. This process, itself, is important for 'building community' within the school and for rallying the group that will become long-term green schoolyard supporters. This exercise in democracy transforms these school stakeholders into stewards of the school grounds who agree to nurture and care for the enriched environment they collectively create (Asphalt to ecosystems, 2010).

This passage highlights the democratic principles that come from participatory design. Participating in these initiatives, from the perspective of green schoolyard advocates, has the potential to transform how individuals think about the construction of the built environment to be more community-driven, and ultimately more equitable.

Farm-to-School

The most tangible impact of farm to school (FTS) programs on community engagement is in building and supporting the local food and agricultural industry. A document from the National Farm to School Network highlighting the benefits of this educational model isolated community engagement and local economic development as two of its five most positive features (The Benefits of Farm to School, April 2017). Research and evaluation of the economic impact of FTS programs included in this document showed that it creates jobs, and strengthens business connections within the state's food economy. For every 1 job created through FTS programs, an additional 1.67 jobs is created from resulting economic activity. Moreover, each dollar of investment in farm to school is shown to stimulate an additional $0.60-$2.16 of local economic activity (The Benefits of Farm to School, April 2017).

Studies on the impacts of farm to school implementation also showed increased educator and parent participation in and at schools. One publication found on the National Farm to School Network webpage cites research showing changes in parent/educator behavior such as positive attitudes about integrating nature into curriculum and instruction, increased knowledge

of local farmers markets, increased parent acceptance of farm school programs, and increased

parent engagement in early childhood educational opportunities (The Benefits of Farm to School,

April 2017). Rosa Romero and Sharon Cech, interview participants involved with PUSD's FTS

program also brought up an increase of parent involvement after PUSD implemented farm to

school:

> You find parents that maybe weren't engaged, now engaged because they have
> a background in farming and agriculture. They weren't part of the PTA, but now
> they're there every week to help with the garden. So I think it's a good way to
> get families involved" (Rosa Romero, Feb. 2017, pers. comm.).

Katia Ahamed is the program coordinator for Pasadena's FTS program. When asked

about the pedagogical underpinnings of Pasadena's program in an interview, she referred me to

the Association for Supervision and Curriculum Development's (ASCD), Whole Child Approach

model (ASCD Whole Child Initiative), which she noted in her interview "is incorporated into our

daily work" at PUSD (Katia Ahmed, March 2018, written comm.). In a list of the six tenets of

this Whole Child model - health, safety, engagement, support, challenge, and sustainability –

each mentions the importance of community enegament at least once one (Whole Child

Indicators). For example it articulates the importance of,s "Collaborating with family and the

local community", offering "a range of opportunities for students to contribute and learn within

the community at large, including service learning, internships, apprenticeships, and volunteer

projects", utilizing "community-based experiences to teach and model pro-social behavior", and

"collaborating with community agencies, service providers, and organizations" (Whole Child

Indicators).

Increasing family participation, stimulating the local economy, and supporting local

agriculture all combine to create a community-minded project design. Through this, students are

provided with a an educational experience that celebrates and encourages community cohesion in

both what they preach and what they practice, as opposed to being psychologically and physically insulated within a classroom. Students are able to apply their education to the context of their own community as well as the food systems of that community. An emphasis on community engagement not only allows for more collaborative work between teachers, family members, and local organizations, but it also provides a place-based approach to education that allows kids to develop a stronger sense of belonging and place within their community through positive, hands-on experiences.

Utilizes Critical Place-Based Learning

To refresh, critical place-based learning, as laid out through the work of Gruenewald, includes a number teaching and learning practices shown below in Figure 6 (Gruenewald 2003a, pg. 3).

Critical Place-Based Learning
- Experiential Learning
- Contextual Learning
- Problem-Based Learning
- Constructivism
- Outdoor Education
- Indigenous Education
- Environmental and Ecological Education
- Bioregional Education
- Democratic Education
- Multicultural Education
- Community-Based Education

Figure 6.

Green Schoolyards

The opportunities for critical place-based learning in green schoolyards are numerous, and Green Schoolyards America, Children & Nature Network, and Bevin Ashenmiller all highlight this as a essential component to successful green schoolyards. From an environmental

perspective, outdoor education, environmental and ecological education, and bioregional

education are present in this model through access to green space and natural environments,

which in turn impact the personal and academic development of students (Building A National

Movement for Green Schoolyards in Every Community, 2016). Providing natural spaces both

for play and educational opportunities is intended to increase environmental literacy in students

through positive first-hand experiences.

One of the many goals of critical place-based learning is developing and/or strengthening

students' connection to their local environment – both urban and ecological. I found that both in

the literature and in my interview with Ashenmiller, local ecology and environmental concerns

are at the forefront of any successful green schoolyard campaign, both in how they are designed

and how they are incorporated into teaching. An excerpt from Green Schoolyards America

states:

> Green schoolyards, built with local, natural materials and native plants, are each
> unique, reflecting of the geography, ecology and culture of their community and
> building a sense of place for children and adults who spend time in them (Danks
> B, 2014).

Bevin Ashenmiller shared a similar insight given her experience at Eagle Rock Elementary,

stating:

> Cool playgrounds are connected to the community. For example one not-great
> model is you have a painted map on the asphalt that has all the states, or the
> state of California with a bunch of stuff on it. But another model is, you have a
> walking trail that has rocks that represent different geologic features from the
> state of California. So you have rocks - which are great anyway because kids
> love rocks - but then these rocks also happen to represent certain things about
> our community (Bevin Ashenmiller, February 2017, pers. Comm.).

Ashenmiller's comments reflect a focus on bioregionalism and contextual learning, two

additional types of place-based learning designed to connect education to localized topics that

students find personal and relatable – in this case California's geography and geologic features.

Bevin Ashenmiller also brought up California's Next Generation Science Standards

(NGSS) as a supportive policy that works in favor of green schoolyards. She stated in her

interview that "NGSS are really intended to encourage students to do science, not just learn

science. So that's an opportunity for school sites to become laboratories" (Bevin Ashenmiller,

2017, pers. comm.). The opportunities to integrate experiential learning into curriculum and

instruction techniques, which in turn increase grades, test scores, and enhance the knowledge of

students in science, math, and language arts (Williams & Dixon, 2013), are encourages by the

states science standards (Appendix A - Conceptual Shifts in the Next Generation Science

Standards). In *Asphalt to Ecosystems,* Danks articulates how "The hands-on experiences of

green schoolyards also help students bridge the divide between theory and practice and solidify

their knowledge in both of these areas" (Asphalt to Ecosystem, 2010). Experiential learning can

be particularly effective when it raises environmental concerns, because it places students at the

center of environmental impacts and environmental solutions, rather using a distant example to

which students may not directly relate. Dank's also includes how green schoolyards should,

"teach students about *their own* impact on the environment, show them the connections between

natural systems, and empower them to make their schoolyard an ecological asset for their

neighborhood. This is very important *positive* message about the relationship between humans

and their environment" (Asphalt to ecosystems, 2010).

 Farm-to-School

 The National Farm to School Network clearly states that the opportunities for "hands-on,

active and experiential learning" (The Benefits of Farm to School, Feb. 2017) drastically

increase when school gardens are available. In the same publication, it cites studies showing that

educators at schools with farm to school adopt "positive attitudes about integrating FTS related

information in curriculum," and have more "intention to implement farm to school activities in the classroom."

Rosa Romero and Sharon Cech also highlighted a few examples in their joint interview of the specific ways place-based learning can occur. In discussing the education gardens within PUSD, they spoke about the importance of "getting your hands dirty and engaging with nature," and "that students take a pride in the campus and it starts to feel like their own when they are actually digging in the dirt and planting the plants" (Rosa Romero and Sharon Cech, Feb 2017, pers. comm.). Experiential learning, outdoor education, and bioregional education are three types of place-based learning that seem obvious to the practice of school gardens, but their true value is best understood when looking at the potential developmental outcomes of these alternative educational experiences.

Similar to the evidence shown in the green schoolyards section, effective place-based education is important for its positive impacts on academic achievement and social-emotional growth. In regards to academic achievement, one publication by Children, Youth and Environment Center for Community Engagement on the benefits of school gardening reference a study that showed significant increases in science test scores for one 5th grade classroom. There is also research that shows "children who grow their own food are more likely to eat fresh fruits and vegetables or express a preference for these foods" (Benefits of Gardening for Children, 2011). Rosa and Sharon also stated that students are more likely to adopt healthy eating habits if they are given opportunities to try healthy alternatives – an option many students, particularly those with lower socio-economic status (Darmon, 2015), do not have. This is significant because it shows how perceptions and actions can drastically change given the effectiveness of experiential and contextual learning. Rosa Romero and Sharon Cech also spoke about the

importance of experiential learning in changing dietary habits in children. They shred that it is vital to have "interactions in understanding what produce is. Where it comes from, but also tasting it," and that "it's a different experience to taste something that's really fresh" (Rosa Romero, Sharon Cech, Feb. 2017, pers. comm.).

Place-based learning is designed to be interactive and relatable to students, and is inherent to FTS educational practices that are outdoors and in the garden. The National Farm to School Network operates with the belief that, "Farm to school activities enhance classroom education through hands-on learning related to food, health, agriculture and nutrition" (The Benefits of Farm to School, 2017). This same publication specifically uses the term "experiential learning" as essential to garden education. Problem-based learning and community-based learning, may also be addressed in FTS lessons that discuss topics such food insecurity, industrialized agriculture, food deserts, and nature/deficit disorder (Rosa Romero, Sharon Cech, Feb. 2017, pers. comm.).

Educates Towards Environmental Literacy

Green Schoolyards

Developing environmental literacy through daily experiences and formal curriculum integration of natural landscapes is one of the main purposes of implementing green schoolyards. Green Schoolyards America isolate the idea of stewardship as one of the central arguments in favor of these projects. In one publication they write:

> Green schoolyards address important environmental issues in ways that even young children can participate in and understand. There are often site-based environmental issues that students can identify themselves, and then become empowered to repair, enriching their own corner of the world with their ingenuity. While these individual actions may be small, together these projects can fundamentally improve the local environment and profoundly change the way that students understand their place in the world. This is a very positive way to approach the field of environmental education, and an inspiring,

optimistic counterpoint to widespread Ecophobia and Nature-Deficit Disorder (Danks A, 2014).

Bevin Ashenmiller also feels strongly about the importance of regular, first hand exposure to nature and ecological systems. However when it comes to outdoor education in schools, these regular interactions are not fully attainable for LAUSD given the financial and human resources required to implement for such a massive district. Optimistically, she states:

> School sites can be something we can do, and day trips, that are more attainable… The more ways kids interact with nature, even if it's time with a tree on your playground, I think the better off the kids will be. The more that we teach kids that the environment isn't this invisible thing, that it is real and can be part of their everyday lives, the more they will care about taking care of it. So school sites represent that opportunity, where even if I can't get you into this pristine wilderness area, maybe I can create a space for you that you can access on a daily basis… I think that the problem with the environment and sustainability is that it's often invisible, so how do we make it visible for kids during that period of time… so how do we get people to value the wilderness in place, where they are, instead of just valuing this wilderness that's far away. We need to value every tree" (Bevin Ashenmiller, Feb. 2017, pers. comm.).

Ashenmiller brings up a core idea surrounding environmental literacy, which is that truly literate citizens understand the relationship between humans and ecological systems in place. In effectively teaching environmental literacy, students must be shown that environmental and ecological issues, even if they not always visible or obvious, are ever present and have real-time impacts. Teaching students that environmental issues exist in their homes, their schools, and their neighborhoods more generally puts them at the center of the human/nature sustainability conflict, making the issues real and relatable.s

Farm-to-School

The implications for environmental literacy in farm to school programs are vast, and are particularly effective due to the strong emphasis on place-based learning that takes place in the gardens. The industrialization of agriculture in the United States has allowed people to live

unaware of the food systems and agricultural practices that may otherwise provide educational

opportunities and insight on ecology, biodiversity, natural life-cycles, and resource management.

The curriculum at PUSD's farm to school educates on all of these issues through effective

experiential learning (Farm to School Lessons K-5). The National Farm to School Network

provides studies that show "improvements in environmental awareness" for kids who

participated in farm to school programs by "providing children with an understanding of

agriculture and the environment" through effective place-based learning (The Benefits of Farm

to School, 2017).

The impacts of these first hand experiences and their impact on environmental literacy

and longitudinal environmental perspectives have been shown in supporting research. An

excerpt from a publication (Benefits of Gardening for Children, 2011) out of University of

Colorado's, Children, Youth and Environments Center for Community Engagement cites

research showing that:

> In a nationwide telephone survey of 2,004 respondents, people who reported
> picking flowers, fruits or vegetables, planting trees, taking care of plants, or
> living next to a garden in childhood were more likely to show an interest in
> gardening as they aged and to form lasting positive relationships with gardens
> and trees [Lohr & Pearson-Mims, 2005]. (Benefits of Gardening for Children,
> 2011).

The publication cites another study showing that in a survey sample of adult gardeners, "most

respondents recalled vivid positive memories of play and exploration in childhood gardens,

which inspired garden ideas and a desire to garden later in life" (Benefits of Gardening for

Children, 2011). An additional study assessing an intergenerational gardening project showed

"students expressed an increased understanding of ecology, interconnections in nature, and

responsibility to care for the environment" (Mayer-Smith et al, 2007).

Further evidence linking environmental literacy concerns to the FTS model is found in

The Whole Child approach to education (ASCD Whole Child Initiative), one of the guiding

pedagogical documents for Pasadena's FTS program according to program coordinator Katia

Ahmed (Katia Ahmed, Mar. 2018, writ. Comm.). One publication from ASCD articulates the

goal that schools "support, promote, and reinforce responsible environmental habits through

recycling, trash management, sustainable energy and other efforts." Although this refers to the

school environment and not necessarily instruction, students who are part of institutions that

publically display and promote actions towards environmental sustainability concerns are leading

by example and exposing kids to tangible actions that mitigate environmental impact.

Fundamentally though, environmental literacy at the FTS programs begins by providing

students with first-hand experiences outdoors, learning about food systems and the human nature

relationship through their own actions. The environmental context of FTS programs in centered

on gardening and food systems, so it does not necessarily cover all ecological sustainability

concerns. However regardless of the instruction content, any lessons and curriculum strategies

that utilize outdoor education have transformative impacts on kids' perceptions about the

environment. They allow kids to develop positive personal relationships with the natural world

and see themselves within natural systems, and these experiences must be recognized as effective

for promoting environmental literacy.

Promotes Empathy, Awareness, and Equity Towards Socio/Economic Inequality

Green Schoolyards

I found that although there are obvious pedagogical implications in areas of

environmental literacy, place-based learning, and community engagement, the implications for

educating around socio-economic inequality are less obvious. That being said, the impacts of

green schoolyards on low-income, urban communities can be tremendous. In connecting back to

the importance of the built environment, I found that many green schoolyard initiatives, as well

as the model more generally, have clear and direct impacts on remedying the social and

environmental issues present in densely populated, urban communities. Moreover, these urban

issues disproportionately impact low-income communities of color (Adelman & Davis, 2016).

Green Schoolyards of America includes in their green schoolyard guide:

> Research convincingly demonstrates that green space is sparser in low-income
> communities and health risks are higher. We at the Children & Nature Network
> have committed to building a strategic intervention for low-income
> communities where the many health benefits of the natural environment can
> mediate stress in children and crate whole-community resilience and vitality
> (Building a national movement for green schoolyards in every community,
> 2016).

Limited mobility in low-income communities of color has been directly

correlated to the quality of the built environment and community assets where people live – one

of which being access to nature and green space. Extensive research shows the effects obesity,

asthma, diabetes, stress, and depression that come from higher rates of sedentary lifestyles that

occur in dense, urban neighborhoods (Building a National Movement for Green Schoolyards in

Every Community, 2016). Explicitly teaching about these issues through instruction and

curriculum in green schoolyards is not inherent, but the tangible benefits to mental and physical

health, as well as academic achievement, clearly are. As the health benefits also translate into

academic success, the effects of green schoolyards as an upstream health and education

promotion should be considered pedagogically important, particularly in there implications

towards equitable childhood development across race and class disparities.

Openlands and Healthy School Campaigns are two organizations responsible for hosting

the 2015 National Green Schoolyards Summit. From this, their collaborators produced a 70-

page document of case studies, supporting research, recommendations, and strategies for the

green schoolyard movement (Green Schoolyards: A growing movement supporting health,

education, and connection with nature, 2015). This extensive report, produced by 60 experts and

advocates of the green schoolyard movement, highlighted the importance of open spaces and

green space in dense urban neighborhoods, as well as their disproportionate health impacts on

low-income communities of color.

> According to a report issued by The Trust for Public Land, 'Only 30 percent of
> Los Angeles residents live within walking distance of a nearby park. Atlanta has
> no public green space larger than one-third of a square mile.'[46] When it comes
> to park space, racial inequity plays a role, too. 'In Los Angeles, white
> neighborhoods (where whites make up 75 percent or more of the residents)
> boast 31.8 acres of park space for every 1,000 people, compared with 1.7 acres
> in African-American neighborhoods and 0.6 acres in Latino neighborhoods,'
> says the report (Green Schoolyards: A growing movement supporting health,
> education, and connection with nature, 2015).

The report goes on to include that, "In these communities, we must do more than just conserve

the little nature that remains. We must begin to create more." Backed by supporting research,

the report illustrates how crime and illegal activity is mitigated, neighborhoods have a stronger

sense of community, people spend more time outdoors, and engaging in more physical activity,

all by having more green and open spaces in urban neighborhoods (Green Schoolyards: A

Growing Movement Supporting Health, Education and Connection with Nature, 2015).

Furthermore, the end of this report makes clear that green school yards target environmental

justice concerns – disproportionate rates of negative environmental impacts on low-income

communities of color – and that green schoolyards act as a strategy for combating racially and

economically biased negative health impacts from living in high density, urban neighborhoods as

shown above.

Both Bevin Ashenmiller and a publication from Green Schoolyards America, highlight

that public school districts are one of the largest landowners in every urban area across the US

(Bevin Ashenmiller, Feb. 2017, pers. comm.; Danks B, 2014). "They (school districts)," said

Ashenmiller, "represent a massive amount of real estate, so from the perspective of green

infrastructure they represent a huge amount of opportunity." Equity of access to green space for

low-income communities of color is a huge issue in almost all urban communities. From what

we know about the mental and physical health benefits of natural play areas and recreational

green space, green schoolyards in public schools can be seen as an obvious solution to

democratizing these health benefits to all children regardless of their socio-economic

background.

Farm-to-School

Access to healthy foods, exposure to nature, and the other many benefits that come from

FTS programs (Benefits of Gardening for Children, 2011) are assets disproportionately

underserviced to low-income communities of color. The National Farm to School Network takes

a firm and intentional stance on the potential of FTS at combatting systemic racism in the

country's food systems. Information from the National Farm to School Network website includes

data on the disproportionate disparities in the US food system across race and ethnic groups.

Low-wealth, communities of color have less access to quality, variety, quantity, and price of

healthy food. The website includes the following passage with references to supporting

evidence,

> More than 1 in 5 children are at risk of hunger, and among African-Americans
> and Latinos, the number is 1 in 3.[2] Black and Latino youths having substantially
> higher rates of childhood overweight and obesity than do their White
> peers.[3] Native Americans are twice as likely as White people to lack access to
> safe, healthy foods, ultimately leading to higher obesity and diabetes
> rates.[3,4,5] Many food system workers take home poverty-level wages, with

women, Blacks and Latinos most likely to earn the lowest.[6] With regards to land ownership, Latinos make up 3.2 percent of today's farm owners, American Indians or Alaska natives 1.8 percent, Black or African people 1.6 percent, and Asians constitute less that 1 percent[7] (Advancing Racial and Social Equity).

When asked about racial and social equity concerns, Katia Ahmed responded positively, saying "We are always keeping diversity and equity in mind designing and creating any program and curriculum" (Katia Ahmed, Mar. 2018, writ. comm.). Moreover, the Whole Child Education model utilized by Pasadena's FTS also includes a clause on equitable educational opportunities, stating that schools must "uphold social justice and equity concepts and practice mutual respect for individual differences at all levels of school interactions – students-to-student, adult-to-student, and adult-to-adult" (Whole Child Indicators, 2013).

Pasadena Unified School District faces particular racial and social disparities according to demographic data available from the Education Data Partnership with the CDE. The three largest student racial/ethnic demographics in 2016/17 were Hispanic or Latino at 58.8%, White at 17.8%, and Black or African American at 12.9% (EdData - District Profile - Pasadena Unified). This racial/ethnic composition is not representative of that of the city of Pasadena more generally, which includes 59% White, 33.6% Hispanic or Latino, 17.9% Asian, and 12.2% Black or African American (American FactFinder – Results, 2016 data). In addition, 18% of PUSD students are considered to be "English learners" according to Ed. Data.org (EdData - District Profile - Pasadena Unified). Rosa and Sharon included in their interview that rates of the free/reduced-meal program is "generally a good way to gauge the population of a school district" by socio/economic factors (Rosa Romero and Sharon Cech, Feb. 2017, per. comm.). In PUSD, 59.6% of students qualify for free/reduced-priced meals, and 67.3% of students are either English learners, foster youth, or eligible for free/reduced-price meals (EdData - District Profile - Pasadena Unified). Pasadena has long been criticized as a tale of two cities when it comes to

socio/economic disparities, and is considered by many to be one of California's most unequal

(Dreier, 2010). The disproportionate rates of none-white and financially vulnerable students in

the public school district strongly reflect that, as it shows wealthier, white families are able to

buy out of the pubic education system. This particular racial and ethnic composition, however,

does create an incredibly robust opportunity for the Pasadena's FTS program to equitably

provide the many benefits of place-based learning, healthy food access, and nutritional education

to Pasadena's most vulnerable children.

Finally, Sharon and Rosa brought up the importance of FTS programs in instilling agency

and self-determination.

> I think it's important for kids to see green, especially in urban areas. I think to
> be able to redefine your space and understand that greening really does add
> value to life I think is really important. And also that innate learning within
> yourself – like if you are given agency then you are going to persevere (Rosa
> Romero, Feb 2017, pers. comm.).

Through place-based learning techniques at farm to school, these students are able to build

"agency, maturity, and leadership" (Rosa Romero and Sharon Cech, Feb. 2017, pers. comm.), in

addition to the many mental, physical, and educational benefits that come from farm to school.

Empowering students and instilling a belief in self-determination can be a powerful tool to

increase academic and social behaviors. These are incorporated into aspects of the Pasadena's

FTS curriculum (Farm to School Lessons K-5 / Chapters), the Whole Child Education model

(Whole Child Indicators), and supported by the CDE more generally (California's Social and

Emotional Learning: Guiding Principles).

Emphasizes Social-Emotional Learning in Formal Lessons/Instruction (CASEL standards)

Green Schoolyards

Similar to raising awareness and promoting equity across socio-economic lines, finding implications on social and emotional learning in green school yards requires more synthesis. Green schoolyards do not inherently educate social emotional learning, however the physical and mental health benefits that come from them impact the social/emotional climate of the schools, both in formal place-based education and through the increased quality of play and social interactions that happen on the yard. To refresh, the goals of social and emotional learning as defined by the Collaborative for Academic, Social and Emotional Learning are shown in Figure 7 below (What is SEL).

Figure 7.

Through a combination of increased beneficial play and place-based, experiential learning, Green Schoolyards America stands by the research that shows social-emotional growth as one of the models greatest assets, "by providing settings for imagination, exploration, adventure, and wonder, and dynamic environments in which to run, hop, skip, jump, twirl, eat and play in active

challenging and creative ways" (Danks A, 2014). A supporting publication by Green

Schoolyards America sites a keynote presentation from the San Francisco Green Schoolyard

Alliance's Growing Greener School Grounds Conference, by Richard Louv. Findings from one

study presented during this talk sshowed:

> Green schoolyards promote imaginative play and provide variety and diversity
> in children's social and play environments, reducing boredom, shifting social
> leadership structures, and leading to fewer disciplinary problems such as
> playground bullying (Danksp B, 2014).

Reduced bullying as a product of green schoolyards makes sense given what research tells us

about how green space and contact with nature can reduce levels of stress and aggression

(Building a National Movement for Green Schoolyards in Every Community, 2016).

The Children & Nature Network include in their publications that on of the key benefits

of green schoolyards is tackling mental health issues. 1 in 5 children have suffered from serious

mental health disorders at some point in their life (National Institute of Mental Health). Through

the unique learning and play opportunities present in dynamic green schoolyards, this publication

cites how these yards help kids feel calmer and less stressed, positive and restored through

decreased negative emotions, and resilient (Building a national movement for green schoolyards

in every community, 2016). Relating these personal benefits to the inherent social landscape of

schools and their classroom dynamics, they go on to show that green schoolyards ultimately

promote social-emotional skills through increased cooperation, civil behavior, and positive social

relationships and increase self-awareness and self-management by reducing aggression and

discipline, as well as promoting responsibility, pride, and confidence through the hands-on,

cooperative and collaborative lessons that green schoolyards uniquely present (Nedovic and

Morrissey, 2013; Bell & Dyment, 2008).

The implications of increasing "child-directed free play that is imaginative, constructive, sensory rich, and cooperative" (Building a National Movement for Green Schoolyards in Every Community, 2016), as well as classroom instruction geared towards serving "multiple-intelligences" (Asphalt to Ecosystems, 2010 pg. 3), helps to support and include all children with different interests and abilities. These two pedagogical intentions help democratize student success in areas of socialization and play, as well as in the classroom. This directly links to theories of critical psychoanalytic pedagogy, which highlight how school traditionally leaves out children with "different" or "abnormal" academic and social needs in education (Mayes).

Farm-to-School

One of the educational critiques from theorists of psychoanalytic pedagogy is that the diverse psycho/emotional needs of students are not always addressed in mainstream education (Deringer, 2017; Mayes, 2017). In their interview, Rosa and Sharon highlighted the role of FTS place-based learning in addressing the "multiple-intelligences" of students:

> There are a lot of different types of intelligence, and I think school really values that mathematical/linguistics intelligence, and most people don't fit into that. There are some people that are just naturally drawn to nature and understanding slow cycles of life, and if you are giving them an opportunity you are giving them a place to bloom. This is usually where you find students who don't engage in other classroom activities, they really thrive in a garden program, because it's something that speaks to them (Rosa Romero and Sharon Cech, Feb. 2017, pers. comm.).

Research on vulnerable populations and FTS participation confirms a positive correlation between garden education and social emotional skills. One study of juvenile offenders showed that participation in a horticulture training program "sparked interest in further education, gave them ideas for green careers, and improved job skills" (Benefits of Gardening for Children; Flagler, 1995). Two other studies of juvenile offenders found increased levels of self-esteem and

pro-environmental attitudes through horticulture and community landscaping (Benefits of Gardening for Children).

The Whole Child Education model referenced by Katia Ahmed heavily refers to social emotional development as a requisite for healthy educational practices, highlighting social emotional themes in each of their six tenets of health, safety, engagement, support, challenge, and sustainability (Whole Child Indicators, 2013). Specifically, the Whole Child Education model articulates the need for school services and faculty to facilitate "mental, social, and emotional dimensions of health," provide "social emotional support systems," ensure the "physical, emotional, academic, and social school climate is safe, friendly, and student centered." In addition, the document emphasizes the need to "teach, model, and provide opportunities to practice social-emotional skills, including effective listening, conflict resolution, problem solving, personal reflection and responsibility, and ethical decision making" (Whole Child Indicators, 2013).

The National Farm to School Network is guided by research that shows FTS program participation "provides children with opportunities for social and emotional growth; improves life-skills, self esteem, social skills and behavior" (The Benefits of Farm to School). One of the California Farm to School Network's partner organizations, Life Lab, provides additional research showing these outcomes as well (The Value of Garden-Based Learning). One of Life Lab's pro-farm to school publications comes from the University of Minnesota Duluth's Center for Environmental Education, which shows through multiple studies increases in student engagement, responsibility, healthy eating habits, enthusiasm, helpful classroom participation, self-esteem, pride, confidence, teamwork, and enriched social interaction in areas of trust, affection, and work ethic, all the while decreasing disruptive behavior (Stewart, 2014).

Barriers and Limitations of Program Implementation

Overlapping Themes

Although the farm to school program at PUSD and Eagle Rock Elementary's green schoolyard project are different models and from different districts, interview responses showed a number of overlapping implementation barriers and limitations. Figure 8 (next page) shows a list of what I synthesized as the most significant and recurring implementation hurdles for these two models. The sections following this graph will show the model-specific barriers that were brought up in interviews, and will draw from existing toolkits, blueprints, and strategy guidelines from leading organizations to corroborate the interview findings – mirroring the method of analysis used in the previous pedagogical assessment.

Former LAUSD School Board President, Steve Zimmer, was interviewed for this project despite not having specifically worked with farm to school or green schoolyard projects. He was interviewed with the same questions about the pedagogies of LAUSD as he perceived them, and of the limits, barriers, and opportunities within the district to implement new programming. His responses are included in Figure 8, as they closely align with the responses of other interview subjects. However, his responses will not be analyzed further due to their lack of relevance to farm to school programs and green schoolyard initiatives specifically. Although not contextually relevant to this paper, Zimmer's responses and expertise in public education help corroborate the responses of other interview subjects about barriers within California public schools.

Interviewees	Funding	Professional development and Training	Charter Schools	Stakeholder "Buy-in"	Policy and Regulations	Cross-Departmental Coordination	Longitudinal Maintenance
Bevin Ashenmiller	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Katia Ahmed	Yes	Yes	Yes		Yes	Yes	Yes
Rosa Romero & Sharon Cech	Yes	Yes		Yes	Yes	Yes	Yes
Steve Zimmer	Yes	Yes	Yes	Yes	Yes	Yes	

Figure 8.

Green Schoolyards

In interviewing Bevin Ashenmiller I found that for the most part, California's Next Generation Science Standards (NGSS) and Environmental Literacy Blueprint should be considered a hopeful sign for green schoolyards and other environmental programing. However, she makes it clear that these new standards and environmental literacy goals lack concrete support from the CDE at the local level – acting essentially as an unfunded mandate. She articulated:

> They're (NGSS) really about doing science and using school as laboratories. But those standards don't come with faculty development or money or training. So schools are left to figure out how to do that. And the same is true for the state environmental literacy guidelines. They have guidelines about what they want students to learn, but again they don't come – they are guidelines about what the standards should be but they don't come with curriculum, they don't come with money for professional development (Bevin Ashenmiller, Feb. 2017, per. comm.).

When schools get grants or district funding to implement a project like a green schoolyard, they are left to their own devices to coordinate curriculum, professional deelopment, and longitudinal maintenance strategies for that project. On the one hand, the NGSS "is not a policy hindrance" (Bevin Ashenmiller, Feb. 2017, pers. comm.) for green schoolyard implementation because these projects actually support NGSS goals of place-based education and interactive science

58

instruction, however the standards do not provide tangible resources on how to achieve the

desired outcomes of NGSS.

When implementing something like a green schoolyard, I found it is difficult for teachers

to effectively utilize these spaces because many may have never taught experiential or outdoor

education before. In discussing the issue of professional development, Ashenmiller articulated:

> If you want them to change how they teach you have to provide resources to do
> that. It's true at any level. Anybody who has walked into a classroom to teach
> anything knows that the easiest thing to do is to do what you've been doing.
> For what we do, what I think about is – ok if I want to engage environmental
> literacy and I want the playground to be a classroom space, ya know, the first
> step is changing the physical space so that it provides resources that can be
> used, but then the second step is to provide resources for the teachers to teach
> them how to use those spaces to meet the standards that they're doing. When
> you do that, my experience is teachers are so happy and excited about it, and
> they use those spaces because they're so great. But they might not necessarily
> use them if they weren't given an opportunity to think about all the different
> cool ways they could use them (Bevin Ashenmiller, Feb. 2017, pers. comm.).

Ashenmiller also brought up the unique maintenance challenges of green schoolyards,

which require specific expertise in ecology and natural systems that the average maintenance

department in urban school districts may not be required to oversee. She included in the

interview that maintenance is a big challenge, largely because "we don't value ecosystem

services." She further included that funding is typically provided as "lump-sum payments for

construction, but not for maintenance services over time while the services of the green

schoolyard are being provided" (Bevin Ashenmiller, Feb. 2017, pers. comm.).

I found that for green schoolyards, cross-departmental coordination between educators

and facilities sectors is poor, making it difficult to maximize the educational potential of green

schoolyard. Ashenmiller states that in her experience, "the curriculum side of the house and the

facilities side of the house don't talk to one another" and that this line of communication

becomes increasingly difficult the bigger the district becomes (Bevin Ashenmiller, Feb. 2017,

pers. comm.). This is particularly pertinent to green schoolyards, which are all about creating

and highlighting hidden curriculum within the built environment of the school – the side largely

in the hands of school facilities. To further complicate this relationship, Ashenmiller shared that

in LAUSD, the second largest district in the country (District Information), curriculum

implementation is broken up into a variety of sub districts, while facilities is not (Bevin

Ashenmiller, Feb. 2017, pers. comm.). This means that for sub-districts aiming to innovate

curriculum around a green schoolyard, facilities may be ill-equipped to innovate the built

environment around their specific curriculum needs. Presently, the work of facilities is likened

to a one-size-fits-all approach for schools that have different needs and pedagogical aspirations.

Funding was the single greatest barrier of implementing the Eagle Rock Elementary

green schoolyard according to Bevin Ashenmiller. In her interview, she broke down the

financial requisites of implementation into two main categories: construction costs and ongoing

programming. Programming costs, according to Ashenmiller, is the most difficult funding to

get, even though it is essential to incorporating curriculum and instructional services to students

over time. Programming costs account issues such as professional development and

maintenance, which both require funding to train and pay competent faculty. This is an ongoing

struggle at Eagle Rock Elementary, according to Ashenmiller. To remedy the lack of

longitudinal program funding, they are forced to seek opportunities within the private sector in

the form of not-for-profits. These organizations provide the services at a cost to the schools,

however Ashenmiller expands that:

> They hire employees who don't have to be credentialed, or unionized. So
> basically we are forced to outsource the jobs to not-for-profits that don't pay well.
> So the gardening programs in LA Unified, they use gardening teachers that are
> not adequately compensated. As a result certainly they are less qualified than a

credentialed teacher. There's high turnover, because they're jobs that people do
for a very short period of time then they move onto something else. You're lucky
if you get somebody that stays for the whole year, so that could be very
disruptive. It's still better than not having somebody. But it is better to have a
teacher on site - some school districts have tried the model of having a gardening
teacher, but it's often because they have more money and can buy a
teacher. (Bevin Ashenmiller, Feb. 2017, pers. comm.).

Finally, one of the biggest barriers for long-term success of green schoolyards according

to Ashenmiller is public buy-in and support. As illustrated in the findings on green schoolyard's

pedagogical assessment, an underlying assumption of green schoolyards is that the beneficial

mental and physical health promotions and increased academic achievement ultimately benefit

larger society. The issue is that these benefits, although illustrated in a many case studies, have

still yet to become mainstream, particularly in how people view them in relation to formal,

public education.   Ashenmiller reflected this in her interview at two separate points. She

included that support of green schoolyard projects, as well as other similar models, needs active

and altruistic support from the many different departments that affect implementation. In the

case of Eagle Rock Elementary, the school board was in favor of the project, but the facilities

department was harder to persuade. She included that, "the school board can say it wants to do

something and the facilities department can say we can't." She also brought up the more

grassroots issue of personal interest. She shared that:

> I think that people only want what they want for their kids, and they don't want
> it for other kids. So what I try to explain is: what if making something good for
> other kids, and the fact that those things are good for those other kids, actually
> makes things better for your kids. Then you can actually help other kids and
> your kids at the same time, wouldn't you want to do that? Like in fact, maybe
> you're screwing your kids up by not helping the other kids. (Bevin Ashenmiller,
> Feb. 2017, pers. comm.).

This represents an ideological barrier within the US that has a history of "Your On Your Own"

approaches to public services (Case Studies, 2008). The prevalence of private and charter

schools represent this, "creating a system where kids opt out of the public system so that they get special stuff has long-term implications for society" (Bevin Ashenmiller, Feb. 2017, pers. comm.). The argument Ashenmiller is making is not that all people should be forced to attend public schools, but rather that society is worse off when public schools are not given the resources to adequately teach and provide enriching, holistic instruction.

Farm to school

Farm to school programs aim to offer three main services (About – CA Farm to School Network), including the cafeteria, education and curriculum, and school gardens. According to Rosa Romero and Sharon Cech, "PUSD is kind of an all-star because they do all three of these things in their farm to school program" (Rosa Romero and Sharon Cech, Feb. 2017, pers. comm.). The implementation success at PUSD should be viewed as a model for other schools aiming to implement FTS, however it is still important to highlight the barriers and limitations that the district had to overcome, as well as those that still affect the FTS program.

PUSD faced a number of different funding barriers. I found in my interviews with both Katia Ahmed and Rosa and Sharon, that these barriers mainly constituted the ongoing maintenance costs of the gardens. Katia Ahmed includes that the district itself does not directly fund maintenance costs of FTS, so the department is "constantly working on writing grants, fundraising, and private donations to support our work" (Katia Ahmed, Mar. 2018, writ. comm.). Rosa and Sharon also included that Pasadena FTS has been forced to adopt innovative strategies for mitigating the burden of maintenance that will be highlighted in the following section. Additional funding barriers included "professional training" (Rosa Romero and Sharon Cech, Feb. 2017, per. comm.) - a critical component to maximizing the full potential of FTS to integrate gardens into curriculum and student learning.

Funding for Pasadena's FTS program started with a grant from the USDA (Rosa Romero and Sharon Cech, Feb. 2017, pers. comm.). Katia Ahmed included in her interview the program's continued need for grant funding, and Rosa and Sharon confirm that the program "depends on grant funding and local foundation funding" (Rosa Romero and Sharon Cech, Feb. 2017, pers. comm.). Both of these interviews articulated the "pressing priorities that need to be addressed" (Katia Ahmed, Mar. 2018, writ. comm.) at PUSD that take precedence over FTS, including "English as a Second Language (ESL)" programs (Rosa Romero and Sharon Cech, Feb. 2017, pers. comm.). When asked about the impact of private and charter schools on PUSD funding, Katia Ahmed referenced the large number of private and charter schools in the city, which she believes "affects our funding and decreases our enrollment" (Katia Ahmed, Mar. 2018, writ. comm.).

Relying almost exclusively on grant and private sector funding, however, limits the the success and growth of FTS, Rosa and Sharon shared that:

> It's hard to think about perfecting a program when the program is struggling so much just to survive and be anything. A lot of the effort in any program – a garden teacher can't come to any meeting without talking about funding. It just doesn't happen (Rosa Romero and Sharon Cech, Feb. 2017, pers. comm.).

Grants are a finite revenue stream. Rosa and Sharon shared that because these grants eventually run out, one of the biggest challenges faced by Pasadena FTS is how to actually institutionalize the FTS program long-term (Rosa Romero and Sharon Cech, Feb. 2017, pers. comm.). Leaving maintenance costs outside of the official district budget leaves the Katia Ahmed and other FTS staff constantly seeking more funds, and conversely putting less time into improving the program above and beyond its current state. Ultimately, relying almost exclusively on private donors and grant funds stagnates the program, as it negates from program expansion and the continued building on best educational practices.

In order for FTS programs to be implemented successfully, they have to meet unique policy requirements such as meeting garden safety protocol, only producing and consuming foods approved by the USDA, and aligning garden curriculum with the CDE's Core Curriculum Standards and NGSS (Rosa Romero and Sharon Cech, Feb. 2017, pers. comm.). In addition to these policy barriers, significant coordination was needed between different departments within the district.

Department and community "buy-in" also came up as a critical barrier at PUSD – buy-in referring to an acceptance and enthusiasm to support the educational value in FTS. In regards to the different departments, Rosa and Sharon articulated that for people like the director of facilities, food service providers, and teachers, FTS requires a long list of work that was not necessarily within their job description. As there is so little funding, there is no fiscal incentive for these employees to do this extra work (Rosa Romero and Sharon Cech, Feb. 2017, pers. comm.). Getting these departments to "buy-in" to the value and mission of FTS was an important barrier to get past in order to have all necessary departments help in the implementation process. The concept of buy-in extends to the PUSD school board, the families, and community partners in Pasadena. Rosa and Sharon stated:

> To get these programs started there has to be an investment from different departments, there has to be an investment from students, there has to be an investment from parents, because it's really a labor of love. And I think seeing that all these adults think something like that is important, and that the students are important, I think can be really powerful (Rosa Romero and Sharon Cech, Feb. 2017, pers. comm.).

The implications of this collective community buy-in means that the program can stay implemented despite being underfunded, as each member is able to pick up some of the slack that comes from being understaffed in areas of maintenance, instruction, programming, and coordination.

Opportunities and Strategies for Program Implementation

Although the PUSD's farm to school program and Eagle Rock Elementary's green schoolyard project faced these numerous challenges, they were ultimately implemented successfully. As such, the barriers listed above were largely overcome through strategies and innovations that can be used to model future successes in other programs. The successes of these programs to effectively implement are contextual to their specific district and the state of California more generally, however they still provide broadly applicable insight into strategies and opportunities for districts and schools that seek to implement these types of programing in the future. In this particular section, information on the strategies and opportunities of Eagle Rock Elementary's green schoolyard were largely unavailable from interview responses. As such, opportunities and strategies for green schoolyard implementation will almost exclusively draw from document analysis from state and national organizations.

Green Schoolyards

Since many of the barriers and limits faced by public districts and schools are related to being under funded and under staff, many of the strategies for implementing green school yards focus on finance, community engagement, organization, and design. These four strategic areas, when executed properly, can allow green schoolyard developments even if the district budget and district policies do not actively support them. Green schoolyards are a way in which local faculty and the community stakeholder can come together to affect grassroots educational reform that bring longitudinal benefits to individual, community, and environmental wellbeing.

Supporting Documents

Asphalt to Ecosystems rightly reminds us that green schoolyards are an internationally widespread model, and that any school interested in implementing one of these initiatives should

utilize the existing resources available online from leading organizations. One such resource

recommended by Sharon Danks is the Evergreen Organization's, *All Hands in the Dirt manual*

(Holmes & Collyer, 200-2006). This toolkit includes ten chapters that walk through the stages of

implementing green schoolyards, covering elements of design, mobilizing support, funding,

advocacy, and curriculum integration.

Given the barriers and limits shown in my findings of the Eagle Rock Elementary green

schoolyard, the most useful chapters to consider are 2, 3, 7, and 8. These chapters directly tackle

themes of community buy-in, department coordination, maintenance, and creative funding. The

other chapters include information on ecological design and guiding pedagogical perspectives

that schools can use to inform their funding and community engagement strategies.

Professional development is a necessary barrier to overcome so that green schoolyards

can become part of the classroom and incorporated into curriculum. As I found in my research,

just because a teacher has access to a green schoolyard does not mean they will want or know

how to use it for pedagogical purposes. To overcome this, districts and schools can draw from a

number of different existing curriculum models, toolkits, and guidelines that show and instruct

teachers on how to build environmental and place-based education into their class instruction.

The California Education and Environment Initiative offers free K-12 curriculum documents

(EEI Curriculum Catalog) following the completion of a faculty-training program (Training -

EEI).

The two guiding green schoolyard manuals that outline barriers and potential

implementation strategies have been used through this paper. The Children & Nature Network's,

Building a National Movement for Green Schoolyards in Every Community provides the

following graphic (Figure 9) the breaks down the necessary components to successful green

schoolyard implementation that has been consolidated from collective research, case studies, and

expertise nationally and around the world (Building a National Movement for Green Schoolyards

in Every Community, 2016).

COMPONENTS FOR SUCCESSFUL IMPLEMENTATION

SCHOOL SUPPORT	DESIGN	COMMUNITY ENGAGEMENT
School Administration Leadership	Research-Based Design	Out-of-School-Time Access
Teacher Training & Curriculum Integration	Participatory Design	After School Programming
On-Going Maintenance	Design for Environmental Impact	Community Recreational Use

Figure 9.

FOUNDATIONAL ELEMENTS

Supporting Policy | Sustainable Funding | Strategic Partnerships

Each of these components is addressed in more detail within the document, and should act as a

resource for future green schoolyard developments.

Referenced earlier in this paper, Openlands and Healthy School Campaign*'s* report,

Green Schoolyards: A Growing Movement Supporting Health, Education and Connection with

Nature, offers a number of innovative implementation strategies that were shown to be effective

in previous case-studies. In the report section titled, *Lessons Learned from Case Studies,* it

isolates four lessons evidenced from the implementation process of four different case studies

outline in an earlier section of the report. These are (Adelman & Davis, 2016):

1. Funding Schools
2. Water Companies and Public Utilities
3. Shared Used Agreements
4. Public-Private Partnerships

Each of these lessons comes with information and guidance on how to "take action" in

these areas to increase implementation success. To expand on these lessons, the report provides

further information on a number of more specific, innovative approaches that schools and

districts can take to bring a green schoolyard to life.

The Healthcare Sector

Partnering with healthcare providers is a mutually beneficial relationship. Schools and

districts are able to utilize their financial and human resources, and hospitals and other

organizations are able to tangibly affect public health through helping build and implement green

schoolyards. Some federal and state health policies also provide benefits to hospitals when they

show involvement with public health initiatives, incentivizing their collaboration with the green

schoolyard movement.

Social Impact Bonds

This is a particular revenue stream provided by private companies with the goal of

financing programs that illustrate positive social impact on at-risk populations. Through a

cost/benefit approach considering the longitudinal societal impacts on giving adequate resources

to at-risk populations, these bonds are ultimately designed to save the government money over

time. Proving the social and economic impacts of green schoolyards would be a necessary

component to securing a social impact bond. Although this is limited, some such studies do exist

(Belfield et al, 2015).

Financial Institutions

Strategically utilize the Community Reinvestment Act (CRA), by seeking grants and

community development loans available from local banks within low and moderate-income

neighborhoods.

Community Partners and Grants

Advocates and supporters of green schoolyards in the form of students, families, staff, and administration can mobilize on the grassroots level to develop relationships with local individuals and organizations that may provide financial and human resources to help actualize the project. This is where community buy-in can become a valuable asset, as community organizing can often make or break the success of green schoolyard implementation. There are also many grants available at the national level through organizations in support of sustainable environmental and social development.

Environmental Justice

Green schoolyards have clear and direct environmental justice impacts by increasing the environmental and social quality of life of public schools and districts with disproportionately high rates of low-income and students of color. As such, a number of grants and organizational partnerships devoted to environmental justice can be a resource for funding and human resources.

Farm to School

The necessary work of coordinating all the relevant departments in PUSD was solved through the full-time, paid position of Katia Ahmed as the district's Farm to School Coordinator. Rosa and Sharon expressed their views on the vital role Katia played in FTS implementation in PUSD:

> I think what's really unique and special about PUSD is their cross-departmental coordination. They've gotten everybody to the table and are like, what can all these different people do from their position to make this whole program work. So it's not just the curriculum in isolation, it's not just teachers doing it. They're working with the health program, working with the gardening teachers, working with facilities to make this whole integrated program come together (Rosa Romero and Sharon Cech, Feb. 2017, pers. comm.).

When asked about her role as program coordinator, Katia Ahmed confirmed the critical need for

this position in successful FTS implementation:

> The program in PUSD is successful only because of the work with multiple departments to maintain and support the work. Maintenance and Operation provide all support in building the gardens, from irrigations, building the beds, digging trenches, etc. Health programs run the program and coordinate implementation across internal and external sectors. Food
> Services make the produce available for students' consumption during meal time. The Curriculum and Instruction departments tie the program into daily classroom science, Common Core and other instruction in the classrooms (Katia Ahmed, Mar. 2018, writ. comm.).

Districts that are considering implementing a FTS program – or any multifaceted program

requiring facilities, education, health and safety, etc. – should model this coordination and

organization framework present in Pasadena FTS. Relieving these departments from the many

logistical burdens of coordination will ultimately allow each to do their job more fully,

ultimately creating more incentive to do the extra work required of them to maintain the project.

I also found that to address the food procurement component of the FTS model – part of

the cafeteria services component to FTS - the district's farm to school organizers utilized a non-

binding resolution that committed PUSD's food service department to buying 2% local food

(Rosa Romero and Sharon Cech, Feb. 2017, pers. comm.). This was an innovative and efficient

way to encourage community buy-in, by the school board making a clear statement showing that

they valued the program and were committed to its successful implementation. Pasadena is one

of the only FTS programs in the country to have implemented local food procurement at this

official capacity, largely because of this non-binding resolution (Rosa Romero and Sharon Cech,

Feb. 2017, pers. comm.).

To account for limited funding, PUSD's facilities department conducted a number of innovative funding strategies that saved district dollars that they were then able to put back into FTS maintenance. Rosa and Sharon articulated:

> In Pasadena, they have a really smart person in facilities. It's really hard to fund gardens, but there's always funding for things like maintaining the grass and for landscaping. So what she did was apply for a lot of grants for things like drought-tolerant landscaping – and there were a lot incentive programs to pull out your lawn, etc. So she used that money to then build gardens. So she's been using facilities fees to help with designing irrigation systems for the gardens. So she's finding a way to use the existing budget to fund these gardens, which is pretty genius (Rosa Romero and Sharon Cech, Feb. 2017, pers. comm.).

Working within the existing facilities budget in innovative ways is one possible strategy future districts can employ to expand their resources. However, managing a complex and tight budget in this way is time intensive and becomes an extra burden on facilities staff. Situations like this are where community buy-in becomes important, as it is often the belief in the pedagogical value of the program, rather than a pay-raise, that motivates employees and stakeholders to do the necessary extra work to implement and maintain an underfunded program.

A critical step that PUSD took to effectively deal with professional training, maintenance, and curriculum burdens was to create a full-time, paid Master Gardener position. Rosa, Sharon and Katia all referenced the important role of this position in the district – one that is typically very hard to fund (Rosa Romero and Sharon Cech, Feb. 2017, pers. comm.). Katia shared the Master Gardener's role in helping creating PUSD K-5 Seed to Table Curriculum (Farm to School Lessons K-5 / Chapters) that needed to meet California's Core Curriculum Standards. To further ensure curriculum was consistent with state standards they "hired a district curriculum coach to design curriculum and help train teachers" (Katia Ahmed, Mar. 2018, writ. comm.). Rosa and Sharon also included that the Master Gardener helps with teaching gardening classes to students and provides , and all interviewees articulated the Master Gardener's important role in providing

"hand-on training and daily support" to teachers (Katia Ahmed, Mar. 2018, writ. comm.).

Interviews made it clear, however, that hiring just a single full-time gardening teacher is not

sufficient to address the necessary levels professional development and garden maintenance that

the entire district requires.

Supporting Documents

The California Fsarm to School Network provides a list of implementation resources

highlighting the steps of how to get a FTS started, the best school garden practices, curriculum

guidance, supportive FTS wellness policies, and food preparation and service practices

(Resources). Additional services include supporting information and research on the value and

impacts of FTS in public schools that can help to guide implementation efforts. Finally, the CA

Farm to School Network provides an extensive list of potential grants that apply to FTS

programs. A more comprehensive array of funding strategies and opportunities for FTS can also

be found at the Western Growers Foundation website (Funding School Gardens). This website

provides fundraising models, contests, grants and grant searching resources, and strategies for

funding a school garden coordinator.

Finally, an extensive report from Occidental College's Urban and Environmental Policy

Institute, written by Anupama Joshi and Moira Beery, presents a vision for comprehensive

growth in the California Farm to School Movement (Joshi & Beery, 2007). This report titled, *A

Growing Movement: A Decade of Farm to School in California,* compiles numerous FTS case

studies from across the state to highlight integral components that have to potential to strengthen,

or are currently strengthening, the movement. Ultimately work in the following areas is

necessary to building sustained support at the state and national level, which will increase

widespread implementation success (Joshi & Beery, 2007).

Education and Learning

Best practices of farm to school curriculum and place-based learning experiences must

continue to grow through information sharing within the FTS networks and supporting

organizations. Additionally, further research and documentation of the positive personal,

community, and economic impacts of FTS must be done to build legitimacy. Being able to

provide robust research on the significant pedagogical, economic, and ultimately societal

benefits of FTS programs is essential for gaining widespread financial and human resource

support.

Local Procurement and Distribution Models

Without procurement of locally sourced produce, a farm to school program is nothing

more than a school garden. Although school gardens are still incredibly valuable from an

educational perspective, the impacts on community engagement and economic growth are not

present as they are when local farmer and agricultural partnerships are central to the program.

As such, a number of models for successful procurement and school/farm relationship strategies

are presented in this section of the report. Although each school and district will have

geographically and ecologically unique strategies in this area, learning from the successes of past

models should inform future procurement strategies.

Policies Supportive of Farm to School

Policy on school health, curriculum, and resource allocation can all get in the way of FTS

implementation. At the state level there have been successful efforts to change health and

curriculum policy in favor of education opportunities for programs like FTS. That being said,

there is still room to reform these policies that increase funding and mitigate some of the

excessive health and safety protocol that challenge FTS (most health and safety policies,

although often barriers and limits of FTS, are actually supported by Rosa and Sharon [Rosa Romero & Sharon Cech, Feb. 2017, pers. comm.]).   Working to implement policy that supports FTS implementation in areas of food procurement, education and curriculum, and the built environment of school gardens will become increasingly important as FTS models become more popular and as research continues to show its many educational and societal benefits.

Outreach and Technical Assistance

This section of the report refers to the need for coordination and collaboration among all proponents and stakeholders of FTS including schools, families, community organizations, national networks, and research groups. This section prints FTS as a necessarily collaborative movement amongst these different parties. The types of information sharing refers to both the technical implementation strategies that deal with barriers such as funding, maintenance, and development, as well as the best pedagogical and educational practices to make the learning component of FTS most effective. This document concludes that this information sharing is mutually enhancing for all parties and that it will ultimately strengthen the movement in all three areas of procurement, education, and school gardens.

Limitations

Interview responses from implementation experts were limited, and not everyone agreed to participate in this project. To further complicate this, literature on the implementation details of the specific farm to school and green schoolyard initiatives at PUSD and Eagle Rock Elementary were not available to me. To account for this limited interview data, I was forced to rely on existing national and state-level literature and research on these model initiatives to corroborate and bolster the findings from the interviews. Both the farm to school model and the

green schoolyard model have been implemented to varying degrees of success throughout the country and abroad, and leading organizations have worked to consolidate the successes and failures of these efforts, as well as their pedagogical strengths, in the form of reports, publications, and toolkits for future use. The experts I interviewed, in addition to their personal comments, referred me to these different resources as important and valid documentation to synthesize to answer my two research questions. Even though they refer to the models more generally, they are still applicable to the specific programs in Pasadena and LA according to the professionals involved with these local projects. Although not ideal, the document analysis and the interview responses did show congruence both in their pedagogical and implementation perspectives, and conversely worked to assess the processes of implementation at the local level.

To understand the intricacies of curriculum and program implementation in California public schools, I originally structured my research specifically around Pasadena Unified School District to show the experiences of one district in isolation. After submitting a research proposal through PUSD's IRB process, I was denied from working with their faculty due to the time and resources of the prior research design. The qualitative data from this original plan was the same – interviews and document analysis. However, these interviews and documents would have been coded for the use of critical social and environmental pedagogies within the classrooms as part of mainstream education, and teachers' experiences would have been the main source of research data. Given the subsequent time restraints from this denial, I was pushed to focus on California's public school system more generally.

Recommendations

Policy recommendations for this paper will not be specifically directed to LAUSD or PUSD. Instead, these two successful case studies of farm to school and green schoolyard

implementation, along with their supporting literatures, will be used to recommend more policy

that allows schools and districts at the local level to fulfill state educational ideals. The literature

review of this paper shows how the California Department of Education's new Core Curriculum

and NGSS, the publication of a California Environmental Literacy Blueprint, and Social

Emotional Learning Partnerships represent the states vision to incorporate pedagogically critical

practices in public education. These efforts provide goals for schools and districts, however do

not provide resources for local municipalities and institutions to implement them.   The

following two recommendations will focus on tangible, relatively cost-effective policies that

increasing farm to school and green schoolyard implementation. In turn, these policies will

ultimately help the state of California actualize its goals for an environmentally and socially

literate citizenry.

Policy Recommendation 1: Facilities Training on Ecological Infrastructure

More money must be allocated to facilities in every California to achieve two different

goals within the department. First, increased funding to facilities departments should manifest in

comprehensive ecological sustainability and construction practices in urban communities.

Including a facilities training program in district policy that covers ecological sustainability and

development directly is critical for addresses state goals to increase place-based learning

practices through Common Core and NGSS, environmental literacy and Social Emotional

Learning. This training program should educate the department faculty on the pedagogical

implications of their work in creating and maintaining the built environment of schools. The

built environment is critical to the pedagogical benefits of both farm to school and green

schoolyard initiatives, and to maximize these educational outcomes facilities must exhibit a

comprehensive knowledge of critical pedagogy. Connecting the two otherwise separate

departments of Facilities and Instruction will increase cross-departmental coordination by linking

their work objectives on a singular pedagogical vision, as well as increase stakeholder buy-in in

the facilities department by educating these faculty on the immense potential to both enhance and

diminish the quality of student life in the work.

Policy Recommendation 2: Sustainable Development Coordinator

Policy at the state level should require all California public school districts to create a

full-time Sustainable Development Coordinator position. Farm to school programs, green

schoolyard initiatives, and other similar project that require intricate coordination across

departments, are likely to fail without adequate programming and coordination. This is both a

funding issue and an issue of human of human resources. If California hopes to enhance the

quality of public schools by promoting environmentally and socially critical programing, they

must also provide the resources to pull it off at the local level. Funding a Sustainable

Development Coordinator, shown to be successful in the work of Katia Ahmed, is perhaps a

more attainable policy goal than for states to have to fund projects directly. Critical pedagogical

programing, whatever form this takes, necessarily involves acute attention to the pedagogical

value of the built environment. This necessitates an enhanced relationship between multiple

departments within school districts that may not otherwise need to cooperate and collaborate

with one another. This level of coordination is shown to be overwhelming do to the time and

resources required of departments who are burden with significant, real-time issues on a daily

basis. A Sustainable Development Coordinator that oversees critical pedagogical programming

and implementation between facilities, instructional, maintenance, and health departments would

relieve that burden from these independent stakeholders, ultimately making each department more efficient and increasing the quality of the program being implemented.

Policy Recommendation 3: Incentive Programs

At the state level, I believe there should be incentive programs for schools and districts that illustrate efforts to increase green space and environmental learning opportunities on site. Although the CDE may not have the financial capacity to directly fund environmental literacy programs across the state, they should work within their budget to create a reward system for schools and districts that are able to implement projects like green schoolyards and farm to school programs on their own. Incentive programs would go a long way in ensuring schools and districts a funding strategy for the ongoing maintenance costs of these projects, and conversely incentivize more schools and districts to make these efforts. By putting their money where their mouth is in incentivizing green infrastructure, the CDE would clearly show that environmental literacy is truly one of their priorities.

Conclusion

This paper aimed to answer two research questions by drawing from qualitative data on case studies of program implementation in California public school districts – LAUSD and PUSD. These case studies were selected based on their presumed emphasis towards critical pedagogical theories of environmental and social sustainability in formal education. Through interviews and document analysis of the green schoolyard model in LAUSD and the farm to school program in PUSD, I asked, *how effective is each model in utilizing critical pedagogical practices, or in their potential to promote future environmentally and socially critical*

programing? After this pedagogical assessment of farm to school and green schoolyard projects,

I asked, *what are the thematic limits, barriers, and opportunities for successful program*

implementation at the local level?

Using a Critical Pedagogy Framework (figure 4), created for this project from existing

literature and research on critical pedagogical theories and practices, my findings showed that

farm to school programs and green schoolyard initiatives both closely align with critical

pedagogical theories, with a focus towards environmental and social sustainability. Each model

showed pedagogical intentions, pedagogical practices, and/or pedagogical impacts for each of

the five components to the Critical Pedagogy Framework (Figure 4) in what they brought to their

schools. In assessing the model-specific barriers and limitations, I was able to able to isolate

funding, professional development and training, charter schools, stakeholder "buy-in," policy

and regulations, cross-departmental coordination, and longitudinal maintenance as the most

recurring and significant implementation barriers for implementing programs in LAUSD and

PUSD.

I originally began this research with the intention of interviewing teachers within

different PUSD about their experiences implementing critical place-based pedagogies into

curriculum. Once denied from the PUSD External Research Review Board, I was forced to

redesign my methodology. This left me with less time to contact and interview experts in public

education and critical pedagogical programming. With more time, I would have researched the

implementation strategies of PUSD farm to school program and Eagle Rock Elementary's green

schoolyard in more detail, and would have drawn from a wider list of interview subjects.

Because this research relied so heavily on the perspectives and work of just a few experts, it

cannot be concluded that the limitations and barriers experienced in these two models will apply

to the implementation of all similar programs. The application of this research is also limited geographically, as the case studies were both within LA County. Geographical, ecological, and policy differences between districts, regions, and states invariably affect the implementation process of all public school programming.

This research fits within larger bodies of research on farm to school programs, green schoolyards, and critical pedagogy more generally. Although limited in scope, this paper attempts to clearly and directly contextualize public education within the pressing environmental and social crisis of out time. Future research on these issues should focus on the longitudinal benefits of critical environmental and social education on students. Such studies can be creative and extend into many fields, from civic engagement to lifestyle choices. Is there a correlation between place-based learning as a child and voting participation later in life? Can daily access to green space in childhood be correlated to fewer mental health problems later in life? Also, more work should be done in assessing the economic and social value things like empathy and ecocentric worldviews – qualities that many people believe are important to cohesive and sustainable social and ecological life, but that lack quantifiable data. Isolated case studies show the benefits of critical pedagogical approaches, however more must be done to be able to convince decision makers that these societal interventions are universally beneficial.

Appendix

Benefits of Gardening for Children

Gardening provides different forms of engagement for children, including designing, planting, and maintaining gardens; harvesting, preparing, and sharing food; working cooperatively in groups; learning about science and nutrition; and creating art and stories inspired by gardens. The studies summarized below have been selected because they include control groups, pre- and post-measures, well controlled correlations, or in-depth qualitative analyses. For more studies, see Blair (2009), "The child in the garden: An evaluative review of the benefits of school gardening."

Key Studies

Photo by Bambi Yost

Lifelong Benefits

Exposure to healthy foods, moderate physical activity, and positive social interactions while gardening in childhood can lead to a lifetime of gardening, as evidenced by semi-structured interviews conducted with participants ranging in age from 18-85 years old (Gross & Lane, 2007). In a nationwide telephone survey of 2,004 respondents, people who reported picking vegetables, taking care of plants, or living next to a garden in childhood were more likely to continue gardening as they aged and to form lasting positive relationships with gardens and trees (Lohr & Pearson-Mims, 2005).

Positive Social and Interpersonal Skills

When third to fifth grade students who participated in a one-year gardening program filled out a survey of life skills, they showed a significant increase in self-understanding, interpersonal relationship skills, and ability to work in groups compared to nonparticipating students (Robinson & Zajicek, 2005). Qualitative surveys of 52 second and third grade students working in a community garden classroom program in San Antonio revealed that participants were likely to have positive bonding experiences with their parents and other adults (Alexander, North, & Hendren, 1995). Children who garden are more accepting of others who are different from themselves (Dyment & Bell, 2006; Eames-Sheavly, 1994), a finding consistent with research that indicates that community gardening projects "grow" community (Glover, 2004).

Healthy Eating and Nutrition

Children who grow their own food are more likely to eat fruits and vegetables (Bell & Dyment, 2008; Libman, 2007; Lineberger & Zajicek, 2000; Morris, Neustadter, & Zidenberg-Cherr, 2001; Pothukuchi, 2004) and to show higher levels of knowledge about nutrition (Canaris, 1995; Koch, Waliczek, & Zajicek, 2006; Pothukuchi, 2004). They are also more likely to continue healthy eating habits throughout their lives (Morris & Zidenberg-Cherr, 2002). Eating fruits and vegetables in childhood has been shown to be an important predictor of higher fruit and vegetable consumption in adulthood, which can help prevent or delay chronic disease conditions over a lifetime (Heimendinger & Van Duyn, 1995).

Science Achievement and Attitudes Towards Learning

Students who are actively engaged in garden projects tend to enjoy learning and show improved attitudes towards education (Canaris, 1995; Dirks & Orvis, 2005). Third, fourth and fifth grade students who participated in school gardening activities scored significantly higher on science achievement tests than students who did not experience any garden-based learning activities (Klemmer, Waliczek, & Zajicek, 2005). Parent involvement, shown to enhance student achievement (Henderson & Mapp, 2002), increases at schools with garden programs (Alexander, North, & Hendren, 1995; Dyment & Bell, 2008).

Self-Efficacy and Enhanced Stewardship

The process of gardening gives empowering experiences. Students engaged in designing and maintaining gardens

Children, Youth and Environments Center for Research and Design
University of Colorado at Denver and Health Sciences Center
www.cudenver.edu/cye

show an increase in self-efficacy (Lekies, et al., 2006; Poston, Shoemaker, & Dzewaltowsk., 2005), proenvironmental attitudes (Mayer-Smith, Bartosh, & Peterat, 2007; Skelly & Zajicek, 1998; Skelly & Bradley, 2007) and environmental stewardship (Alexander, North, & Hendren, 1995; Mayer-Smith, Bartosh, & Peterat, 2007; Pothukuchi, 2004; Waliczek, Bradley, & Zajicek, 2001). Plus, active gardening, such as picking flowers or planting trees as a child, has been shown to have a strong influence on how natural areas and gardens are valued in adulthood (Lohr & Pearson-Mims, 2005).

Special Populations

A study of children with learning disabilities who engaged in gardening found that they increased their nonverbal communication skills, developed awareness of the advantages of order, learned how to participate in a cooperative effort, and formed positive relationships with adults (Dyment & Bell, 2006). Juvenile offenders who enjoy gardening show improved self-esteem, interpersonal relationships, and

attitudes towards school (Cammack, Waliczek, & Zajicek, 2002; Flagler, 1995; Waliczek, Bradley, & Zajicek, 2001). A pre-post study utilizing the standardized Behavior Assessment System for Children showed that co-ed groups of juvenile offenders who participated in a school gardening program significantly improved their interpersonal skills (Cammack, Waliczek, & Zajicek, 2002). Gardening has long been recognized as a therapeutic healing activity which can positively impact mental health and well-being (Bell & Dyment, 2008; Ulrich, 1999).

Photo by Irene Pevec

References:

Alexander, J., North, M. W., & Hendren, D. K. (1995). Master gardener classroom garden project: An evaluation of the benefits to children. *Children's Environments* 12(2): 256-263.

Bell, A. C. & Dyment, J. E. (2008). Grounds for health: The intersection of green school grounds and health-promoting schools. *Environmental Education Research*, 14(1): 77-90.

Blair, D. (2009). The child in the garden: An evaluative review of the benefits of school gardening. *Journal of Environmental Education* 40(2): 15-38.

Cammack, C., Waliczek, T. M., & Zajicek, J. M. (2002). The green brigade: The psychological effects of a community-based horticultural program on the self-development characteristics of juvenile offenders. *HortTechnology* 12(1): 82-86.

Canaris, I. (1995). Growing foods for growing minds: Integrating gardening and nutrition education into the total curriculum. *Children's Environments* 12(2): 134-142.

Dirks, A. E. & Orvis, K. (2005). An evaluation of the junior master gardener program in third grade classrooms. *HortTechnology* 15(3): 443-447.

Dyment, J. E. & Bell, A. C. (2006). "Our garden is colour blind, inclusive and warm": Reflections on green school grounds and social inclusion. *International Journal of Inclusive Education* 12(2): 169-183.

Eames-Sheavly, M. (1994). Exploring horticulture in human culture: An interdisciplinary approach to youth education. *HortTechnology* 4(1): 77-80.

Flagler, J. (1995). The role of horticulture in training correctional youth. *HortTechnology* 5(2): 185-187.

Glover, T. D. (2004). Social capital in the lived experiences of community gardeners. *Leisure Sciences* 26(2): 143-162.

Gross, H. & Lane, N. (2007). Landscapes of the lifespan: Exploring accounts of own gardens and gardening. *Journal of Environmental Psychology* 27(3): 225-241.

Heimendinger, J. & Van Duyn, M. A. (1995). Dietary behavior change: the challenge of recasting the role of fruit and vegetables in the American diet. *American Journal of Clinical Nutrition* 61(6): 1397-1401.

Henderson, A. T. & Mapp, K. L. (2002). *A new wave of evidence: The impact of school, family, and community connections on student achievement. Annual synthesis, 2002.* National Center for Family & Community Connections with Schools, Southwest Educational Development Laboratory: Austin, TX

Klemmer, C. D., Waliczek, T. M., & Zajicek, J. M. (2005). Growing minds: The effect of a school gardening program on the science achievement of elementary students. *HortTechnology* 15(3): 448-452.

Koch, S., Waliczek, T. M., & Zajicek, J. M. (2006). The effect of a summer garden program on the nutritional knowledge, attitudes, and behaviors of children. *HortTechnology* 16(4): 620-625.

Lekies, K. S.,Eames-Sheavly, M., Wong, K., & Ceccarini, A. (2006). Children's garden consultants: A new model of engaging youth to inform garden design and programming. *HortTechnology* 16(1): 139-142.

Libman, K. (2007). Growing youth growing food: How veyetable gardening influences young people's food consciousness and eating habIts. *Applied Environmental EducatIon & Communication* 6(1): 87-95.

Lineberger, S. E. & Zajicek, J. M. (2000). School gardens: Can a hands-on teaching tool affect students' attitudes and behaviors regarding fruit and vegetables? *HortTechnology* 10(3): 593-597.

Lohr, V. I. & Pearson-Mims, C. H. (2005). Children's active and passive interactions with plants influence their attitudes and actions toward trees and gardening as adults. *HortTechnology* 15(3): 472-476.

Mayer-Smith, J., Bartosh, O., & Peterat, L. (2007). Teaming children and elders to grow food and environmental consciousness. *Applied Environmental Education & Communication* 6(1): 77-85.

Morris, J., & Zidenberg-Cherr, S. (2002). Garden-enhanced nutrition curriculum improves fourth-grade school children's knowledge of nutrition and preference for vegetables. *Journal of the American Dietetic Association, 102*(1), 91-93.

Morris, J. L., Neustadter, A., & Zidenberg-Cherr, S. (2001). First-grade gardeners more likely to taste vegetables. *California Agriculture, 55*(1), 43-46.

Poston, S. A., Shoemaker, C. A., & Dzewaltowski, D. A. (2005). A comparison of a gardening and nutrition program with a standard nutrition program in an out-of-school setting. *HortTechnology* 15(3): 463-467.

Pothukuchi, K. (2004). Hortaliza: A youth 'nutrition garden' in southwest Detroit. *Children, Youth and Environments* 14(2): 124-155.

Robinson, C. W. & Zajicek, J. M. (2005). Growing minds: The effects of a one-year school garden program on six constructs of life skills of elementary school children. *HortTechnology* 15(3): 453-457.

Skelly, S. M. & Zajicek, J. M. (1998). The effect of an interdisciplinary garden program on the environmental attitudes of elementary school students. *HortTechnology* 8(4): 579-583.

Skelly, S. M. & Bradley, J. C. (2007). The growing phenomenon of school gardens: Measuring their variation and their affect on students' sense of responsibility and attitudes toward science and the environment. *Applied Environmental Education & Communication* 6(1): 97-104.

Ulrich, R. S. (1999). Effects of gardens on health outcomes. In Marcus, C. C. and M. Barnes, M. (eds.), *Healing gardens: Therapeutic benefits and design recommendations,* (pp. 27–86). New York, NY: John Wiley and Sons.

Waliczek, T. M., Bradley, R. D., & Zajicek, J. M. (2001). The effect of school gardens on children's interpersonal relationships and attitudes toward school. *HortTechnology* 11(3): 466-468.

THE BENEFITS OF
FARM TO SCHOOL

Stay Informed

Join our network:
FarmtoSchool.org

Twitter
@FarmtoSchool

Facebook
National Farm to School Network

Instagram
@FarmtoSchool

NATIONAL **FARM to SCHOOL** NETWORK

GROWING STRONGER TOGETHER
The National Farm to School Network is as an information, advocacy and networking hub for communities working to bring local food sourcing, school gardens and food and agriculture education into school and early care and education settings.

Updated April 2017

What is Farm to School?

Farm to school enriches the connection communities have with fresh, healthy food and local food producers by changing food purchasing and education practices at schools and early care and education sites. Farm to school empowers children and their families to make informed food choices while strengthening the local economy and contributing to vibrant communities. Farm to school implementation differs by location but always includes one or more of the following three core elements:

Procurement: Local foods are purchased, promoted and served in the cafeteria, as a snack or in classroom taste-tests.

Education: Students participate in education activities related to agriculture, food, health and nutrition.

School gardens: Students engage in hands-on, experiential learning through gardening.

Why Farm to School?

KIDS WIN

Farm to school provides all kids access to nutritious, high-quality, local food so they are ready to learn and grow. Farm to school activities enhance classroom education through hands-on learning related to food, health, agriculture and nutrition.

FARMERS WIN

Farm to school can serve as a significant financial opportunity for farmers, fishers, ranchers, food processors and food manufacturers by opening doors to an institutional market worth billions of dollars.

COMMUNITIES WIN

Farm to school benefits everyone from students, teachers and administrators to parents and farmers, providing opportunities to build family and community engagement. Buying from local producers and processors creates new jobs and strengthens the local economy.

Benefits of Farm to School

Economic Development   **Public Health**   **Education**   **Environment**   **Community Engagement**

Economic Development

Job Creation and Economic Activity

- Creation and maintenance of jobs in the community and in the state; for every job created by school districts purchasing local foods, additional economic activity creates another 1.67 jobs.[40,55]
- Increase in economic activity in the community and in the state.[40,49,50,55]
- Each dollar invested in farm to school stimulates an additional $0.60-$2.16 of local economic activity, in one case resulting in $1.4 million overall contribution to the state.[40]
- Strengthen connections within the state's food economy.[40]
- Increase in student meal participation from 3 percent to 16 percent (average +9 percent), generating increased revenue for schools through meal programs.[8-9,20-21,23-25,36,41,49,58]
- Decrease in school meal program costs.[41,48]

Farmer and Producer Income

- Increase in local procurement as farm to school programming matures, with documented local sourcing reaching up to 50 percent of all produce purchases in season.[7-9,20,22-23,25,36-37,39]
- Average 5 percent increase in income from farm to school sales and establishment of a long-term revenue stream for individual farmers.[7,9,20,22-23,36,39,55]
- Increase in market diversification and economic growth opportunities for farmers; positive relationships for farmers with school districts, parents and community members; farmers contracted to plant crops for schools; opportunities to explore processing and preservation methods for institutional markets; establishment of grower collaboratives or cooperatives to supply institutional markets.[36-37, 68]

Public Health

Farm to school is a community-based strategy that includes a focus on creating a healthy school food environment.[1] Farm to school activities support development of healthy eating habits for children while improving family food security by boosting the quality of school meal programs.[2-5]

Student Nutrition Behaviors

- Improvement in early childhood and K-12 student health behaviors, including choosing healthier options at school meals, consuming more fruits and vegetables through farm to school meals and at home (+0.99 to +1.3 servings/day), consuming less unhealthy foods and sodas, reducing screen time and increasing physical activity.[6-31,43-46,49,51,53,57,61-64,67,68]
- Increase in fruit and vegetable consumption among those with the lowest previous intake.[51]
- When schools offer school gardens, 44.2 percent of students eat more fruits and vegetables; when schools serve local food, 33.1 percent of students eat more fruits and vegetables.[46]
- Demonstrated willingness to try new foods and healthier options (in early childhood and K-12 settings).[7,20-22,30-33,45,47]

- Tripled amount of fruit and vegetable consumption when students participate in hands-on, food-based activities.[47]
- Minimized diet-related diseases in childhood such as obesity and diabetes through the promotion of eating fresh fruits and vegetables, specifically for high-risk, low-income students.[50,59,61]

Knowledge, Attitudes and Access

- Improvement in nutrition habits, environmental awareness and health-related knowledge.[57,61]
- Increase in willingness to try and consumption of fruits and vegetables at an older age due to gardening at a young age.[60]
- Increase in access to fruits and vegetables; increase in planning and preparing meals at home.[57,61-64]
- Increase in ability and interest in incorporating healthier foods into family diets and guiding children in early childhood and K-12 to make healthier choices; positive changes in shopping patterns reflecting healthy and local foods.[7,20,22,27,33,68]
- Increase among young children in asking their families to make healthier purchases.[33]
- Improvement in household food security.[40]
- Improvement in food service operations to support healthy outcomes, such as increased cafeteria offerings of fruits and vegetables; development of new seasonal recipes; changes in cafeteria waste management policies.[8-9,21,23-25,36,37]

Education

Student Engagement and Academic Achievement

- Increase in knowledge and awareness about gardening, agriculture, healthy eating, local foods, nutrition, growing cycles, seasonality and other STEM concepts (in early childhood and K-12 settings).[7,20-22,26,31-33,42,44,48,49,61,68]
- Enhanced overall academic achievement in K-12 settings, including grades and test scores; increase in opportunities for physical activity and social and emotional growth; increase in school engagement.[53,61,63,57]
- Provides children with an understanding of agriculture and the environment; provides children with opportunities for social and emotional growth; improves life skills, self-esteem, social skills and behavior.[34-35,48,50,53,57,63]
- Increased opportunity for innovative teaching platforms for core subjects, such as science, math and language arts in early childhood and K-12 settings.[68]
- Greater opportunity for necessary experiential and hands-on learning.[50,69]
- Encourages low-income students and students of color to engage in food and environmental issues in their communities.[53]

Educator and Parent Engagement

- Positive changes in teachers' diets and lifestyles; positive attitudes about integrating farm to school related information in curriculum; intention to implement farm to school activities in the classroom.[7,20-22, 30,52,66]
- Increase in knowledge among parents of young children about farmers' markets.[33]
- Increase in parent acceptance of farm to school programs as their children demonstrate healthier behaviors such as increased fruit and vegetable consumption.[54]
- Increased parent engagement in early childhood educational opportunities.[68]
- Improvements in food service staff motivation and morale; increase in knowledge and interest in local food preparation and seasonal recipes; increase in interactions with teachers to strengthen classroom and cafeteria connections.[7,22,38]

Environment

Food Waste

- Reduced food waste of local food, both on the production side as well as plate waste; decrease in overall food waste due to farm to school activities.[41,56,58]

Sustainability

- Reduced transportation-related environmental impacts, such as emissions of air pollutants.[50,71]
- Support of environmentally sound, sustainable and socially just approaches to food production, processing, packaging, transportation and marketing.[68]

Community Engagement

- Increase in community awareness about and interest in purchasing local foods and foods served in school cafeterias.[7,22]
- Improved acceptance of healthier school meals among the community.[58]
- Increase in opportunities to combat racial and economic inequities in the school food system.[70]
- Increase in support from parents and community for healthier school meals.[41,58]

Summary of Farm to School Benefits

Population	Reach	Benefits	
Students			
Fruit and vegetable consumption	Increased +0.99 to +1.3 servings per day	Public Health	
Physical activity	Reduced screen time and increased physical activity	Public Health	
Health	Minimized diet-related diseases such as childhood obesity and diabetes	Public Health	
Food system awareness	Increased knowledge about gardening, agriculture, healthy food, local food, seasonality	Public Health Education	
Food choices	Willingness to try new and healthy food; choosing healthier options in the cafeteria and at home	Public Health Education Community Engagement	
Academic achievement	Overall improvement in both grades and test scores (K-12)	Education	
Behavior	Improved life skills, self-esteem, social skills and other types personal growth	Education	
Schools			
Meal participation	Average increase of 9% (range 3% to 16%)	Economic Development Public Health	
Meal cost	Lowers school meal program costs	Economic Development	
Local food sourcing	Reaching up to 50% of all produce purchases in season	Economic Development Environment	
Cafeteria options	Increased offerings of fruits and vegetables; new seasonal recipes; new waste management policies	Public Health Environment	
Food service staff	Improved morale; increased knowledge of local food	Education Community Engagement	
Educators	Positive diet and lifestyle changes; greater intent to integrate farm to school activities in the classroom	Public Health Education Community Engagement	
Learning opportunities	Greater opportunity for hands-on, active and experiential learning opportunities	Public Health Education	
Farmers and Producers			
Income	Average increase of 5%	Economic Development	
Markets	Increased diversification and new opportunities	Economic Development Community Engagement	
Families and Community Members			
Local economy	$0.60-$2.16 economic activity generated for every $1 spent	Economic Development	
Job creation	Each new farm to school job contributes to the creation of additional 1.67 jobs	Economic Development Community Engagement	
Low-income students and students of color	Decreases health risks; encourages community engagement in environmental issues	Public Health Community Engagement	
Parents and families	Increased food security and positive diet changes; increased student participation in meals at home	Public Health Community Engagement	
Food waste and transportation	Decreased food waste; decreased air pollution	Environment	

86

Resources

1. Green LW, Sim L, Breiner H. Evaluating Obesity Prevention Efforts: A Plan for Measuring Progress. The National Academies Press, Washington D.C.: Committee on Evaluating Progress of Obesity Prevention Efforts; Food and Nutrition Board; Institute of Medicine. 2013.

2. White House Task Force on Childhood Obesity Report to the President. Solving the Problem of Childhood Obesity within a Generation. 2010.

3. United States Department of Agriculture. Know Your Farmer, Know Your Food Initiative. 2010. Available at http://www.usda.gov/ wps/portal/ usda/knowyourfarmer?navid=KNOWYOURFARMER

4. Turner L, Chaloupka FJ. School Policies and Practices to Improve Health and Prevent Obesity: National Elementary School Survey Results Executive Summary. Bridging the Gap, Chicago: University of Illinois. 2010.

5. Keener D, Goodman K, Lowry A, Kettle Khan L. Recommended community strategies and measurements to prevent obesity in the United States: Implementation and measurement guide. 2009.

6. Joshi A, Azuma AM, Feenstra G. Do Farm-to-School Programs Make a Difference? Findings and Future Research Needs. J Hunger Environ Nutr. 2008;3(2/3):229–46.

7. Schmidt MC, Kolodinsky J, Symans C. The Burlington School Food Project, Final Evaluation Report. Center for Rural Studies, Vermont University. 2006.

8. Feenstra G, Ohmart J. Yolo County Farm to School Evaluation Report. Davis, CA: A Report of UC Sustainable Agriculture research and Education Program. 2005.

9. Feenstra G, Ohmart J. Yolo County Farm to School Evaluation Report for the California Farm to School Program. Davis, CA: A Report by UC Sustainable Agriculture Research and Education Program. 2004.

10. Evans A, Ranjit N, Rutledge R, Medina J, Jennings R, Smiley A, et al. Exposure to multiple components of a garden-based intervention for middle school students increases fruit and vegetable consumption. Health Promot Pract. 2012;13(5):608–16.

11. Howerton MW, Sue Bell B, Dodd KW, Berrigan D, Stolzenberg-Solomon R, Nebelling L. School-based Nutrition Programs Produced a Moderate Increase in Fruit and Vegetable Consumption: Meta and Pooling Analyses from 7 Studies. J Nutr Educ Behav. 2007;39(4):186–96.

12. Ratcliffe MM, Merrigan KA, Rogers BL, Goldberg JP. The effects of school garden experiences on middle school-aged students' knowledge, attitudes, and behaviors associated with vegetable consumption. 2011;12(1):36–43.

13. LaRowe TL, Bontrager Yoder AB, Knitter A, Meinen A, Liebhart JL, Schoeller D. Wisconsin Farm to School: One year evaluation Report. Madison, WI: University of Wisconsin-Madison: Wisconsin Prevention of Obesity and Diabetes; Department of Family and Nutritional Sciences; Wisconsin Department of Health Services. 2011.

14. Joshi A, Azuma A. Bearing Fruit: Farm to School Program Evaluation Resources and Recommendation. Center for Food and Justice, UEPI, Occidental College. 2009.

15. Knai C, Pomerleau J, Lock K, McKee M. Getting children to eat more fruit and vegetables: A systematic review. Prev Med. 2006;42(2):85–95.

16. Blair D. The Child in the Garden: An Evaluative review of the Benefits of School Gardens. J Environ Educ. 2009;40(2):15–38.

17. Robinson-O'Brien R, Story M, Heim S. Impact of garden-based youth nutrition intervention programs: a review. J Am Dietetic Assoc. 2009 Feb;109(2):273–80.

18. Hermann JR, Parker SP, Brown BJ, Siewe YJ, Denney BA, Walker SJ. After-School Gardening Improves Children's Reported Vegetable Intake and Physical Activity. J Nutr Educ Behav. 2006;38:201–2.

19. Twiss J, Dickinson J, Duma S, Keinman T, Paulsen H, Rilveria L. Community gardens: Lessons learned from California Healthy Cities and Communities. Am J Public Health. 2003;93(9):1435–8.

20. Joshi A, Kalb M, Beery M. Going Local: Paths to success for farm to school programs. Center for Food and Justice, UEPI, Occidental College. 2006.

21. Abernethy Elementary, Portland Public Schools Nutrition Services, Injury Free Coalition for Kids, Ecotrust. New on the Menu: District wide changes to school food start in the kitchen at Portland's Abernethy Elementary. 2006. Available at http://www.ecotrust.org/farmtoschool/ downloads/Abernethy_report.pdf

22. Croom E, et. al. Growing Farms, Growing Minds: The Burlington School Food Project, Year One Evaluation 2003-04, Center for Rural Studies, Vermont University. 2006.

23. Center for Food and Justice, UEPI, Occidental College. Riverside Farm to School Demonstration Project: Final grant report to the California Endowment. December 2006 and 2004.

24. Flock P, Petra C, Ruddy V, Peterangelo J. A Salad Bar Featuring Organic Choices: Revitalizing the School Lunch Program. 2003.

25. Christensen H. Juanamaria Healthy Schools Project Final Evaluation Report. Ventura County Superintendent's Office. 2003.

26. The Food Trust. Kindergarten Initiative Evaluation Report. 2007 Available at http://www.farmtoschool.org/ les/publications_114.pdf

27. Morris JL, Zidenberg-Cherr S. Garden-enhanced nutrition curriculum improves fourth-grade school children's knowledge of nutrition and preferences for some vegetables. J Am Diet Assoc. 2002;102(1):91-93.

28. McAleese JD, Rankin LL. Garden-based nutrition education affects fruit and vegetable consumption in sixth-grade adolescents. J Am Diet Assoc. 2007;107(4):662-665.

29. Graham H, Zidenberg-Cherr S. California teachers perceive school gardens as an effective nutritional tool to promote healthful eating habits. J Am Diet Assoc. 2005;105(11):1797-1800.

30. Murphy JM. Education for Sustainability. Findings from the Evaluation Study of the Edible Schoolyard. 2003. Available at http://74-220-222-140.host- monster.com/publications/pdf/ESYFindings-DrMurphy.pdf

31. Hughes LJ. Creating a Farm and Food Learning Box Curriculum for preschool-aged children and their families. J Nutr Educ Behav. 2007;39:171-172.

32. Triant SL, Ryan A. City of Wyoming Parks and Recreation Summer 2005 Programming Evaluation. Wyoming, MI: A Report of Mixed Greens. 2005.

33. Phillips Z, Romero R, Smith K, Reddy R. Farm to Preschool, Strategies for growing healthy children and communities. Presentation. CACFP Roundtable conference. 2011.

34. Dirks AE, Orvis K. An evaluation of the Junior Master Gardener Program in third grade classrooms. HortTechnology. 2005;15(3):443-447.

35. Waliczek TM. The effect of school gardens on children's interpersonal relationships and attitudes toward school. HortTechnology. 2001;11(3):466-468.

36. Gottlieb R. Evaluation of the Santa Monica Farmers' Market Salad Bar Program. Center for Food and Justice, UEPI, Occidental College. 2001.

37. School Food Plus. School Food Plus Evaluation, Interim Evaluation, Phase 2 Report. 2005.

38. Izumi BT, Alaimo K, Hamm MW. Farm-to-School Programs: Perspectives of School Food Service Professionals. J Nutr Educ Behav. 2010;42(2):83-91.

39. Market Ventures, Inc., Karp Resources, Center for Health and Public Service Research, New York University. School Food Plus Evaluation Interim Report Phase 3 School Year 2005-2006. Market Ventures, Inc. 2007.

40. Upstream-Oregon HIA 2011 - Upstream Public Health. Health impact assessment HB 2800: Oregon farm to school and school garden policy. 2011. Available at http://www.upstreampublichealth.org/sites/ default/ les/ F2SHIA_FINALlow-res_0.pdf

41. United States Department of Agriculture, Food and Nutrition Services. The Farm to School Census. 2016. Available at https://farmtoschoolcensus.fns.usda.gov/schools-serving-kids-eating-healthier-school-meals

42. Mercier S. Food and Agriculture Education in the United States. AGree. 2015.

43. W.K Kellogg Foundation. 2015 School Food Poll. 2015. Available at http://ww2.wkkf.org/2015schoolfoodpoll/

44. Moss A, et al. Farm to School and Nutrition Education: Positively Affecting Elementary School-Aged Children's Nutrition Knowledge and Consumption Behavior. Childhood Obesity. 2013;9(1):51–56.

45. County Health Rankings. Farm to school programs. 2015. Available at http://www.countyhealthrankings.org/policies/farm-school-programs

46. Pew Charitable Trusts and Robert Wood Johnson Foundation. School Meal Programs Innovate to Improve Student Nutrition. 2016.

47. Koch P, Wolf R, Graziose M, Gray HL, Trent R, Uno C. FoodCorps: Creating Healthy School Environments. Laurie M. Tisch Center for Food, Education & Policy, Program in Nutrition, Teachers College, Columbia University. 2017.

48. Wein K. Lettuce Improve School Nutrition: Best Practices and Key Impacts of the USDA Farm to School Grant Program. Duke University Sanford School of Public Policy. 2016.

49. Roche E, et al. Economic Contribution and Potential Impact of Local Food Purchases Made by Vermont Schools. Center for Rural Studies, University of Vermont. 2016.

50. Office of the New York State Comptroller. Locally Grown: Farm-to-School Programs in New York State. 2016.

51. Bontrager Yoder AB, et al. Farm to Elementary School Programming Increases Access to Fruits and Vegetables and Increases Their Consumption Among Those With Low Intake. J Nutr Educ Behav. 2014;46(5):341–49.

52. Stephens L, Shanks CB, Roth A, Bark K. Montana Cook Fresh Workshop Pilot: A K-12 School Nutrition Professional Training to Incorporate Whole Foods in School Meals. J Child Nutr Manag. 2016;40(1).

53. Ray R, Fisher DR, Fisher-Maltese C. School Gardens in the City: Does Environmental Equity Help Close the Achievement Gap? Hutchins Center for African and African American Research. DuBois Review. 2016;3(2):379-95.

54. Holland JH, Green JJ, Alexander L, Phillips M. School Health Policies: Evidenced-based Programs for Policy Implementation. Journal of Policy Practice. 2016;15(4):314-332.

55. Kane D, Kruse S, Ratcliffe MM, Sobell SA, Tessman N. The Impact of Seven Cents. EcoTrust. 2010.

56. Bontrager Yoder AB, Foecke LL, Schoeller DA. Factors affecting fruit and vegetable school lunch waste in Wisconsin elementary schools participating in Farm to School programmes. Public Health Nutrition. 2015;18(15):2855–2863.

57. Boxmeyer C. 2013-2014 Program Impact. Druid City Garden Project. 2014.

58. USDA Office of Communications. New USDA Data Show Growing Farm to School Efforts Help to Reduce Plate Waste, Increase Student Participation in Healthier School Meals Program. 2015. Available at http://content.govdelivery.com/accounts/USDAOC/bulletins/12074ef

59. Capogrossi K, You W. The Influence of School Nutrition Programs on the Weight of Low-Income Children: A Treatment Effect Analysis. Health Economics. 2016;1099-1050.

60. Loso J, et al. Childhood and Current Gardening Is Associated with Increased Fruit and Vegetable Intake among College-Aged Students Participating in the Get Fruved Study. J Am Diet Assoc. 2016;116(9):A13.

61. County Health Rankings. School fruit & vegetable gardens. 2015. Available at http://www.countyhealthrankings.org/policies/school-fruit-vegetable-gardens

62. Savoie-Roskos MR, et al. Increasing Fruit and Vegetable Intake among Children and Youth through Gardening-Based Interventions: A Systematic Review. J Am Diet Assoc. 2017;117(2):240–250.

63. Berezowitz CK, Bontrager Yoder AB, Schoeller DA. School Gardens Enhance Academic Performance and Dietary Outcomes in Children. J Sch Health. 2015;85(8):508-18.

64. Heim S, Stang J, Ireland M. A Garden Pilot Project Enhances Fruit and Vegetable Consumption among Children. J Am Diet Assoc. 2009;09(7):1220-6.

65. Parmer SM, Salisbury-Glennon J, Hannon D, Struempler B. School Gardens: An Experiential Learning Approach for a Nutrition Education Program to Increase Fruit and Vegetable Knowledge, Preference, and Consumption among Second-grade Students. J Nutr Educ Behav. 2009;41(3):212–217.

66. Cohen NL. Food Safety from Farm and Garden to Preschool. National Institute of Food and Agriculture and University of Massachusetts. Sept 2011-Aug 2015.

67. Izumi BT, et al. Harvest for Healthy Kids Pilot Study: Associations between Exposure to a Farm-to-Preschool Intervention and Willingness to Try and Liking of Target Fruits and Vegetables among Low-Income Children in Head Start. J Acad Nutr Diet. 2015;115(12):2003-2013.

68. Hoffman JA, et al. Farm to Preschool: The State of the Research Literature and a Snapshot of National Practice. J Hunger Environ Nutr. 2016;1-23.

69. Division of Nutrition, Physical Activity, and Obesity, National Center for Chronic Disease Prevention and Health Promotion. Early Care and Education State Indicator Report. 2016.

70. Giancatarino A, Noor S. Building the Case for Racial Equity in the Food System. Center for Social Inclusion. 2014.

71. National Resource Defense Council. Food miles: How far your food travels has serious consequences for your health and the climate. 2017.

Photo Credits

children & nature
NETWORK

GREEN SCHOOLYARDS
CAN IMPROVE ACADEMIC OUTCOMES

THE ISSUE
Only 1/3 of U.S. 8th graders perform at or above standards for science and math.[1]

SCHOOLS ACROSS THE NATION ARE SEEKING WAYS TO IMPROVE ACADEMIC OUTCOMES FOR ALL STUDENTS

Green schoolyards promote academic achievement through hands-on, experiential learning and by enhancing the cognitive and emotional processes important for learning.

ENHANCING LEARNING

Green schoolyards provide **experiential learning across many subjects.**[2,3]

33 of 40 school garden studies (83%) found **IMPROVED OUTCOMES** in science, math & language arts.[2]

BETTER GRADES
A+

HIGHER TEST SCORES

ENHANCED KNOWLEDGE
ACROSS SEVERAL SUBJECTS

2,3,4

GREEN SCHOOLYARDS CAN
★ Help students focus attention and regulate behavior[5,6]
★ Enhance attitudes and engagement with school[7,8]
★ Support creativity, critical thinking and problem solving[9]

ROOM WITH A VIEW

Seeing nature and greenery from school buildings can foster positive academic outcomes.[10,11]

HIGH SCHOOLERS WITH VIEWS OF TREES HAD:[12]

HIGHER standardized test scores

HIGHER graduation rates

HIGHER % of students planning to attend a 4-yr college

SUPPORTING RESEARCH

[1] www.nationsreportcard.gov [2] Williams & Dixon (2013). Impact of garden-based learning on academic outcomes in schools: Synthesis of research between 1990 and 2010. *Rev Educ Res*, 83(2), 211–235. [3] Wells et al. (2015). The effects of school gardens on children's science knowledge: A randomized controlled trial of low-income elementary schools. *Int Journal Sci Educ*, 37(17), 2858–2878. [4] Berezowitz et al. (2015). School gardens enhance academic performance and dietary outcomes in children. *J School Health*, 85(8), 508–518. [5] Berto et al. (2015). How does psychological restoration work in children? An exploratory study. *J Child Adolesc Behav* 3(3). [6] Chawla et al. (2014). Green schoolyards as havens from stress and resources for resilience in childhood and adolescence. *Health Place*, 28, 1–13. [7] Maynard et al. (2013). Child-initiated learning, the outdoor environment and the "underachieving child." *Early Years*, 33(3), 212 – 225. [8] Rios & Brewer (2014). Outdoor education and science achievement. *Appl Environ Educ Commun*, 13(4), 234–240. [9] Kellert (2005). *Building for life: Designing and understanding the human-nature connection*. Washington, DC: Island Press. [10] Li & Sullivan (2016). Impact of views to school landscapes on recovery from stress and mental fatigue. *Landscape Urban Plan*, 148, 149–158. [11] Wu et al. (2014). Linking student performance in Massachusetts elementary schools with the "greenness" of school surroundings using remote sensing. *PLoS ONE* 9(10): e108548: 1–9. [12] Matsuoka (2010). Student performance and high school landscapes: Examining the links. *Landscape Urban Plan*, 97(4), 273–282.

ADDITIONAL RESEARCH USED FOR THIS INFOGRAPHIC AVAILABLE AT childrenandnature.org/gsybibliographies

children & nature NETWORK

GREEN SCHOOLYARDS ENCOURAGE BENEFICIAL PLAY

THE ISSUE
8-18 year olds in the U.S. spend an average of 7.5 hrs per day using entertainment media.[1]

KIDS NEED TO PLAY: PLAY SUPPORTS PHYSICAL, SOCIAL & EMOTIONAL WELL-BEING.

Natural areas promote child-directed free play that is imaginative, constructive, sensory rich and cooperative.

ENCOURAGING IMAGINATIVE, COOPERATIVE FREE PLAY

GREEN SCHOOLYARDS CAN:

- Accommodate different ages & abilities [2,3]
- Sustain children's interest [4,5]
- Offer a variety of options that appeal to a wide range of play interests [2]
- Promote cooperation & negotiation [4,6]
- Strengthen links between play & learning [2,3,4]

GREEN SCHOOLYARDS CAN SUPPORT DIFFERENT TYPES OF PLAY [2,4,7,8]

DRAMATIC PLAY
Loose parts—such as sticks, stones, acorns & pinecones—engage the imagination.

EXPLORATORY PLAY
Natural areas provide opportunities for children to explore.

SOLITARY PLAY
Areas under bushes or other nooks allow children to engage in alone time and contemplation.

CONSTRUCTIVE PLAY
Building things out of natural materials helps children learn hands-on skills.

LOCOMOTOR PLAY
Natural items such as logs and rocks can be carried. Looping paths allow walking, running and biking.

SUPPORTING RESEARCH

[1]Rideout et al. (2010). Generation M2: Media in the lives of 8-18 year olds. Kaiser Family Foundation https://kaiserfamilyfoundation.files.wordpress.com/2013/01/8010.pdf [2]Dyment & Bell (2008). Grounds for movement: Green school grounds as sites for promoting physical activity. Health Educ Res, 23(6), 952-962. [3]Stanley (2011). The place of outdoor play in a school community: A case study of recess values. Child Youth Environ, 21(1), 185-211. [4]Dennis et al. (2014). A post-occupancy study of nature-based outdoor classrooms in early childhood education. Child Youth Environ, 24(2), 35-52. [5]Luchs & Fikus (2013). A comparative study of active play on differently designed playgrounds. J Adven Educ & Outd Learn, 13(3), 206-222. [6]Acar & Torquati (2015). The power of nature: Developing pro-social behavior towards nature and peers through nature-based activities. Young Children, 70(5), 62-71. [7]Chawla (2015). Benefits of nature contact for children. J Plan Lit, 30(4), 433-452. [8]Cloward Drown & Christensen (2014). Dramatic play affordances of natural and manufactured outdoor settings for preschool-aged children. Child Youth Environ, 24(2), 53-77.

ADDITIONAL RESEARCH USED FOR THIS INFOGRAPHIC AVAILABLE AT childrenandnature.org/gsybibliographies

children & nature network

GREEN SCHOOLYARDS
CAN PROVIDE MENTAL HEALTH BENEFITS

THE ISSUE

1 in 5 children has, or has had, a serious mental health disorder at some point in their lives.[1]

MENTAL HEALTH PLAYS A CRITICAL ROLE IN THE COGNITIVE, EMOTIONAL, & SOCIAL DEVELOPMENT OF CHILDREN AND YOUTH.

Green schoolyards can enhance mental health and well-being and promote social-emotional skill development.

GREEN SCHOOLYARDS HELP KIDS FEEL:

CALMER & LESS STRESSED[2,3]
Views of green landscapes from classroom windows helped high school students recover more quickly from stressful events.[4]

POSITIVE & RESTORED[3]
Forest schools enhanced positive and decreased negative emotions.[5]

RESILIENT[2]
Natural areas enhanced feelings of competence and increased supportive social relationships that help build resilience.[2]

GREEN SCHOOLYARDS PROMOTE SOCIAL-EMOTIONAL SKILLS

PRACTICE RELATIONSHIP SKILLS[2]
Children demonstrated more cooperative play, civil behavior and positive social relationships in green schoolyards.[6,7]

DEVELOP SELF-AWARENESS & SELF-MANAGEMENT
Green schoolyards can reduce aggression and discipline problems.[6,7]
Gardening at school helped students feel proud, responsible & confident.[3]

SUPPORTING RESEARCH

[1] www.nimh.nih.gov/health/statistics/prevalence/any-disorder-among-children.shtml [2] Chawla et al. (2014). Green schoolyards as havens from stress and resources for resilience in childhood and adolescence. *Health Place*, 28, 1-13. [3] Kelz et al. (2015). The restorative effects of redesigning the schoolyard: A multi-methodological, quasi-experimental study in rural Austrian middle schools. *Environ Behav*, 47(2), 119-139. [4] Li & Sullivan (2016). Impact of views to school landscapes on recovery from stress and mental fatigue. *Landscape Urban Plan*, 148, 149-158. [5] Roe & Aspinall (2011). The restorative outcomes of forest school and conventional school in young people with good and poor behavior. *Urban For Urban Gre*, 10(3), 205-212. [6] Bell & Dyment (2008). Grounds for health: The intersection of green school grounds and health-promoting schools. *Environ Educ Res*, 34(1), 77-90. [7] Nedovic & Morrissey (2013). Calm, active and focused: Children's responses to an organic outdoor learning environment. *Learn Environ Res*, 16(2), 281-295.

ADDITIONAL RESEARCH USED FOR THIS INFOGRAPHIC AVAILABLE AT childrenandnature.org/gsybibliographies

C&NN recognizes that not all studies support causal statements.   ©2016 CHILDREN & NATURE NETWORK

NATURE CAN IMPROVE HEALTH AND WELLBEING

Spending time in nature provides children with a wide range of health benefits.

NATURE CAN IMPROVE ACADEMIC OUTCOMES

Spending time in nature enhances educational outcomes by improving children's academic performance, focus, behavior and love of learning.

BETTER ACADEMIC PERFORMANCE
Learning in natural environments can:

BOOST PERFORMANCE
in reading, writing, math, science and social studies
1, 2, 3, 4, 5

ENHANCE
creativity, critical thinking and problem solving [9]

Seeing nature from school buildings can foster academic success [6, 7, 8]

ENHANCED ATTENTION
Spending time in nature can help children focus their attention:

FOCUS AND ATTENTION
10, 11, 12, 13

ADHD SYMPTOMS
14, 15

The greener the setting, the better the focus [14, 15]

INCREASED ENGAGEMENT & ENTHUSIASM
Exploration and discovery through outdoor experiences can promote motivation to learn:

INCREASED ENTHUSIASM FOR LEARNING
1, 16

GREATER ENGAGEMENT WITH LEARNING [17]

IMPROVED BEHAVIOR
Nature-based learning is associated with reduced aggression and fewer discipline problems: [18, 19]

MORE IMPULSE CONTROL [10]

LESS DISRUPTIVE BEHAVIOR
20

children & nature network   NLC NATIONAL LEAGUE OF CITIES   THE JPB FOUNDATION   ADDITIONAL RESEARCH ON THE BENEFITS OF NATURE AVAILABLE AT childrenandnature.org/research

SUPPORTING RESEARCH
[1] Lieberman & Hoody (1998). Closing the achievement gap: Using the environment as an integrating context for learning. Results of a Nationwide Study. San Diego. SEER. [2] Chawla (2015). Benefits of nature contact for children. J Plan Lit, 30(4), 433–452. [3] Berezowitz et al. (2015). School gardens enhance academic performance and dietary outcomes in children. J School Health, 85(8), 508–518. [4] Williams & Dixon (2013). Impact of garden-based learning on academic outcomes in schools: Synthesis of research between 1990 and 2010. Rev Educ Res, 83(2), 211–235. [5] Wells et al. (2015). The effects of school gardens on children's science knowledge: A randomized controlled trial of low-income elementary schools. Int J Sci Educ, 37(17), 2858–2878. [6] Li & Sullivan (2016). Impact of views to school landscapes on recovery from stress and mental fatigue. Landscape Urban Plan, 148, 149–158. [7] Wu et al. (2014) Linking student performance in Massachusetts elementary schools with the "greenness" of school surroundings using remote sensing. PLoS ONE 9(10): e108548. [8] Matsuoka, R. H. 2010. Student performance and high school landscapes. Landscape and Urban Planning 97 (4), 273–282. [9] Moore & Wong (1997). Natural Learning: Rediscovering Nature's Way of Teaching. Berkeley, CA: MIG Communications. [10] Faber Taylor et al. (2001). Views of nature and self-discipline: Evidence from inner-city children. J Environ Psy, 22, 49–63. [11] Mårtensson et al. (2009). Outdoor environmental assessment of attention promoting settings for preschool children. Health Place, 15(4), 1149–1157. [12] Wells (2000). At home with nature effects of "greenness" on children's cognitive functioning. Environ Behav, 32(6), 775–795. [13] Berto et al. (2015). How does psychological restoration work in children? An exploratory study. J Child Adolesc Behav 3(3). [14] Faber Taylor et al. (2001). Coping with ADD: The surprising connection to green play settings. Environ Behav, 33(1), 54–77. [15] Amoly et al. (2014). Green and blue spaces and behavioral development in Barcelona schoolchildren: The BREATHE Project. Environ Health Perspect, 122,1351–1358. [16] Blair (2009) The child in the garden: An evaluative review of the benefits of school gardening. J Environ Educ, 40(2), 15–38. [17] Rios & Brewer (2014). Outdoor education and science achievement. Appl Environ Educ Commun, 13(4), 234–240. [18] Bell & Dyment (2008). Grounds for health: The intersection of green school grounds and health-promoting schools. Environ Educ Res, 14(1), 77–90. [19] Nedovic & Morrissey (2013). Calm, active and focused: Children's responses to an organic outdoor learning environment. Learn Environ Res, 16(2), 281–295. [20] Ruiz-Gallardo & Valdés (2013). Garden-based learning: An experience with "at risk" secondary education students. J Environ Educ, 44(4), 252–270.

C&NN recognizes that not all studies support causal statements.

©2016 CHILDREN & NATURE NETWORK

Bibliography

"A Blueprint for Environmental Literacy." 2015. California Department of Education. 2015.
https://www.cde.ca.gov/pd/ca/sc/environliteracyblueprint.asp#TaskForceIntro.

"Accountability: ESSA." n.d. Accessed October 16, 2017.
https://www2.ed.gov/policy/elsec/leg/blueprint/faq/accountability.pdf

Adelmann, Jerry, and Davis, Rochelle. n.d. "Green Schoolyards: A Growing Movement Supporting Health, Education and
Connection with Nature." Accessed March 31, 2018. https://healthyschoolscampaign.org/wp-
content/uploads/2016/03/GreenSchoolyards.pdf.

"Advancing Racial and Social Equity." 2018. National Farm to School Network. 2018.
http://www.farmtoschool.org/equity.

Ahmed, Katia. Interview by Author. March 2018.

"Appendix A - Conceptual Shifts in the Next Generation Science Standards." 2013. April 2013.
https://www.nextgenscience.org/sites/default/files/Appendix%20A%20-
%204.11.13%20Conceptual%20Shifts%20in%20the%20Next%20Generation%20Science%20Standards.pdf.

"ASCD Whole Child Initiative." 2018. Association for Supervision and Curriculum Development. 2018.
http://www.ascd.org/whole-child.aspx.

Ashenmiller, Bevin. Interview by Author. February 2017.

"Behaviorism | Simply Psychology." n.d. Accessed October 15, 2017.
https://www.simplypsychology.org/behaviorism.html.

Belfield, Clive; Bowden, Brooks; Klapp, Alli; Levin, Henry; Shand, Robert; Zander, Sabine. 2015. "The Economic Value
of Social and Emotional Learning." February 2015. http://blogs.edweek.org/edweek/rulesforengagement/SEL-
Revised.pdf.

Bell, Anne C., and Janet E. Dyment. 2008. "Grounds for Health: The Intersection of Green School Grounds and Health-
promoting Schools." *Environmental Education Research* 14 (1): 77–90.
https://doi.org/10.1080/13504620701843426.

"Benefits of Gardening for Children." 2011. October 2011. https://www.colorado.edu/cedar/sites/default/files/attached-
files/Gardening_factsheet_2011.pdf.

Berliner, David. 2011. "Rational Responses to High Stakes Testing: The Case of Curriculum Narrowing and the Harm
That Follows." *Cambridge Journal of Education* 41 (3):287–302. https://doi.org/http://0-
dx.doi.org.oasys.lib.oxy.edu/10.1080/0305764X.2011.607151.

Blad, Evie. n.d. "Social-Emotional Learning: States Collaborate to Craft Standards, Policies." Education Week - Rules for
Engagement. Accessed March 22, 2018. http://blogs.edweek.org/edweek/rulesforengagement/2016/08/social-
emotional_learning_states_collaborate_to_craft_standards_policies.html?cmp=SOC-SHR-FB.

Blos, P. (1941) The Adolescent Personality: A Study of Individual Behavior for the Commission on Secondary School
Curriculum (New York: D. Appleton-Century).

Booth, Margaret Zoller, and Jean M. Gerard. 2011. "Self-Esteem and Academic Achievement: A Comparative Study of
Adolescent Students in England and the United States." *Compare* 41 (5):629–48.
https://doi.org/10.1080/03057925.2011.566688.

Bowers, A. C. (1993). *Education, cultural myths, and the ecological crisis: Toward deep changes* State University of New York Press, State University Plaza, Albany, NY 12246. Retrieved from https://0-oxy.idm.oclc.org.oasys.lib.oxy.edu/login?url=https://0-search.proquest.com.oasys.lib.oxy.edu/docview/62704404?accountid=12935

Bowers, C. A. 2001. *Educating for Eco-Justice and Community*. University of Georgia Press.

"Building a National Movment for Green Schoolyards in Every Community." 2016. 2016. https://www.childrenandnature.org/wp-content/uploads/2015/03/CNN_GSY_Report2016_Final.pdf.

Bureau, U. S. Census. n.d. "American FactFinder - Results." Accessed April 2, 2018. https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF.

Darmon, Nicole, and Adam Drewnowski. 2015. "Contribution of Food Prices and Diet Cost to Socioeconomic Disparities in Diet Quality and Health: A Systematic Review and Analysis." *Nutrition Reviews* 73 (10): 643–60. https://doi.org/10.1093/nutrit/nuv027.

"California's Social and Emotional Learning Guiding Principles." 2018. 2018. https://www.cde.ca.gov/eo/in/documents/selguidingprincipleswb.pdf.

"Campus Ecology LAUSD." n.d. LAUSD Sustainability Initiatives Site. Accessed March 22, 2018. http://learninggreen.laschools.org/campus-ecology.html.

"Case Studies." 2008. Unnatural Causes: Is Inequality Making Us Sick? 2008. https://www.unnaturalcauses.org/case_studies.php.

"CASEL." n.d. Collaborative for Academic, Social, and Emotional Learning. Accessed March 22, 2018. https://casel.org/.

"Children & Nature Network." n.d. Children & Nature Network. Accessed March 25, 2018. http://www.childrenandnature.org.

"Children's Contact with the Outdoors and Nature: A Focus on Educators and Educational Settings." 2010. March 2010. https://www.childrenandnature.org/wp-content/uploads/2015/04/EducationsynthesisMarch2010FINAL.pdf.

Common Core. 2012. "LEARNING LESS Public School Teachers Describe a Narrowing Curriculum." March 2012. http://greatminds.net/maps/documents/reports/cc-learning-less-mar12.pdf.

"Core SEL Competencies." n.d. Accessed March 22, 2018. https://casel.org/core-competencies/.

Deringer, S. Anthony. 2017. "Mindful Place-Based Education: Mapping the Literature." *Journal of Experiential Education*, June, 1053825917716694. https://doi.org/10.1177/1053825917716694.

"District Information." n.d. About Los Angeles Unified School District. Accessed April 3, 2018. https://achieve.lausd.net/about.

Dreier, Peter. 2010. "Pasadena's Tale of Two Cities." December 30, 2010. http://scholar.oxy.edu/cgi/viewcontent.cgi?article=1429&context=uep_faculty.

"EdData - District Profile - Pasadena Unified." n.d. Education Data Partnership. Accessed April 2, 2018. https://www.ed-data.org/district/Los-Angeles/Pasadena-Unified.

"EEI Curriculum Catalog." 2016. February 2016. http://www.californiaeei.org/media/1072/curriculum-catalog.pdf.

"Every Student Succeeds Act (ESSA) | U.S. Department of Education." n.d. Accessed October 16, 2017. https://www.ed.gov/essa?src=policy

"Farm to School Lessons K-5 / Chapters." n.d. Accessed April 2, 2018. https://www.pusd.us/domain/2008.

Flagler, Joel. 1995. "The Role of Horticulture in Training Correctional Youth." 1995. http://horttech.ashspublications.org/content/5/2/185.full.pdf.

Freire, P. (1995). Pedagogy of the oppressed. New York: Continuum. (Original work published 1970)

"Funding School Gardens." n.d. The Collective School Garden Network. Accessed April 4, 2018. http://www.csgn.org/content/funding-school-gardens.

Gibbs, Thomas, and Aimee Howley. n.d. "'World-Class Standards' and Local Pedagogies: Can We Do Both? ERIC Digest." Accessed October 12, 2017. http://files.eric.ed.gov/fulltext/ED448014.pdf.

Greenspan, S. I. (1989) Emotional intelligence. In K. Field, B. J. Cohler and G. Wool (eds), Learning and Education: Psychoanalytic Perspectives (Madison, CT: International Universities Press), 209–243.

Gruenewald, David. 2003a. "The Best of Both Worlds: A Critical Pedagogy of Place." May 2003. http://journals.sagepub.com/doi/pdf/10.3102/0013189X032004003.

Gruenewald, David. 2003b. "Foundations of Place: A Multidisciplinary Framework for Place-Conscious Education." Fall 2003. http://journals.sagepub.com/doi/pdf/10.3102/00028312040003619.

Haymes, S. (1995). Race, culture and the city: A pedagogy for Black urban struggle. Albany: State University of New York Press.

Holmes, Randee, and Collyer, Cam. 2000. "All Hands in the Dirt: A Guide to Designing and Creating Natural School Grounds." Evergreen. 2006 2000. https://www.evergreen.ca/downloads/html/all-hands/.

"Home." n.d. Green Schoolyards America. Accessed March 25, 2018. http://www.greenschoolyards.org/.

Huffling, Lacey D., Heidi B. Carlone, and Aerin Benavides. 2017. "Re-Inhabiting Place in Contemporary Rural Communities: Moving toward a Critical Pedagogy of Place." Cultural Studies of Science Education 12 (1):33–43. https://doi.org/10.1007/s11422-016-9756-2.

Joshi, Anupama and Beery, Moira. 2007. "A Growing Movement: A Decade of Farm to School in California." June 2007. http://scholar.oxy.edu/cgi/viewcontent.cgi?article=1381&context=uep_faculty.

Kirman, W. J. (1977) Modern Psychoanalysis in the Schools (Dubuque, IA: Kendall/Hunt).

Kymes, Nancy. 2004. "The No Child Left Behind Act: A Look at Provisions, Philosophies and Compromises." Journal of Industrial Teacher Education 41 (2).

Lindsay, Anne, and Alan Ewert. 1999. "Learning at the Edge: Can Experiential Education Contribute to Educational Reform?" The Journal of Experiential Education; Boulder 22 (1):12–19.

"Local Control and Accountability Plan (LCAP)." n.d. California Department of Education. Accessed March 22, 2018. https://www.cde.ca.gov/re/lc/.

Lohr, Virginia I., and Caroline H. Pearson-Mims. 2005. "Children's Active and Passive Interactions with Plants Influence Their Attitudes and Actions toward Trees and Gardening as Adults." HortTechnology 15 (3): 472–76.

Maller, Cecily, Mardie Townsend, Anita Pryor, Peter Brown, and Lawrence St Leger. 2006. "Healthy Nature Healthy People: 'contact with Nature' as an Upstream Health Promotion Intervention for Populations." Health Promotion International 21 (1):45–54. https://doi.org/10.1093/heapro/dai032.

Mayes, Clifford. n.d. "The Psychoanalytic View of Teaching and Learning." Accessed October 13, 2017. http://www.tandfonline.com/doi/pdf/10.1080/00220270802056674?needAccess=true.

Mayer-Smith, Jolie, Oksana Bartosh, and Linda Peterat. 2007. "Teaming Children and Elders to Grow Food and Environmental Consciousness." *Applied Environmental Education & Communication* 6 (1): 77–85. https://doi.org/10.1080/15330150701319529.

Means, Morgan. 2013. "Sustaining Nature, Transforming Society: Rethinking Sustainability Through Radical Ecopolitical Thought." 2013. https://dspace.library.colostate.edu/bitstream/handle/10217/80271/Means_colostate_0053N_11769.pdf?sequence=1&isAllowed=y.

"Mental Illness." n.d. National Institute of Mental Health. Accessed March 31, 2018. https://www.nimh.nih.gov/health/statistics/mental-illness.shtml.

Nedovic, Sonya, and Anne-Marie Morrissey. 2013. "Calm Active and Focused: Children's Responses to an Organic Outdoor Learning Environment." *Learning Environments Research* 16 (2): 281–95. https://doi.org/10.1007/s10984-013-9127-9.

"No Child Left Behind Act of 2001." n.d. Accessed October 13, 2017. http://www.k12.wa.us/esea/NCLB.aspx.

"Preserving and Sustaining School Gardens." n.d. Accessed March 22, 2018. http://learninggreen.laschools.org/uploads/8/0/0/0/8000811/preserving_and_sustaining_school_gardens.pdf.

"Resources." n.d. California Farm to School Network. Accessed March 25, 2018. http://www.cafarmtoschool.org/resources/.

Richard, Mora. n.d. "'School Is So Boring': High-Stakes Testing and Boredom at an Urban Middle School | Penn GSE Perspectives on Urban Education." Accessed October 3, 2017. http://www.urbanedjournal.org/archive/volume-9-issue-1-fall-2011/school-so-boring-high-stakes-testing-and-boredom-urban-middle-sch.

Romero, Rosa; Cech, Sharon. Interview by Author. February 2017.

Sala, Matthew R. Della, and Robert C. Knoeppel. 2015. "Measuring the Alignment between States' Finance and Accountability Policies: The Opportunity Gap." *Education Policy Analysis Archives* 23 (0):61.

Schindel Dimick, Alexandra. 2016. "Exploring the Potential and Complexity of a Critical Pedagogy of Place in Urban Science Education." *Science Education* 100 (5):814–36. https://doi.org/10.1002/sce.21233.

Sharon Danks. 2010. "Getting from Here to There." In *Asphalt to Ecosystems*. New Village Press. https://static1.squarespace.com/static/57682b81725e25259d8396e3/t/578578a38419c25970a84250/1468364963904/SharonDanks_Asphalt2Ecosystems_p1-4.pdf.

———. 2014a. "The Green Schoolyard Movement." February 6, 2014. https://static1.squarespace.com/static/57682b81725e25259d8396e3/t/578578fa29687ff48a7c42ea/1468365053369/GSA-1-Danks-CNN-WhyGreenSchoolyards_4-16-15rs.pdf.

———. 2014b. "The Power and Potential of Green Schoolyards." February 7, 2014. https://static1.squarespace.com/static/57682b81725e25259d8396e3/t/57857671579fb3892caa4272/1468364408426/GSA-2-Danks-CNN-Power-and-Potential_GreenSchlyrds_4-17-15rs.pdf.

"Social and Emotional Learning - Initiatives & Programs." n.d. California Department of Education. Accessed March 22, 2018. https://www.cde.ca.gov/eo/in/socialemotionallearning.asp.

"State Superintendent Tom Torlakson Announces Launch of #GoOpen Initiative and Collaboration in Common Professional Learning Community." 2016. California Department of Education News Ralease. August 2, 2016. https://www.cde.ca.gov/nr/ne/yr16/yr16rel55.asp.

Stevenson, Robert B. 2008. "A Critical Pedagogy of Place and the Critical Place(s) of Pedagogy." *Environmental Education Research* 14 (3): 353–60. https://doi.org/10.1080/13504620802190727.

Stewart, Melanie. 2014. "Student Learning Outcomes of Garden-Based Education: A Literature Review." May 2014. http://www.lifelab.org/wp-content/uploads/2015/04/Stewart-2014-Student-Learning-Outcomes-of-Garden-Based-Education.pdf.

"The Benefits of Farm to School." 2017. April 2017. http://www.farmtoschool.org/Resources/BenefitsFactSheet.pdf.

"The Value of Garden-Based Learning." n.d. Accessed April 2, 2018. http://www.lifelab.org/for-educators/schoolgardens/whyschoolgardens/.

"Training - California Education and the Environment Initiative (EEI)." n.d. Accessed April 4, 2018. http://www.californiaeei.org/training/.

Trautwein, Ulrich, Oliver Lüdtke, Olaf Köller, and Jürgen Baumert. 2006. "Self-Esteem, Academic Self-Concept, and Achievement: How the Learning Environment Moderates the Dynamics of Self-Concept." *Journal of Personality and Social Psychology* 90 (2):334–49. https://doi.org/http://0-dx.doi.org.oasys.lib.oxy.edu/10.1037/0022-3514.90.2.334.

"Using School Gardens as an Instructional Tool." 2008. Student Health and Human Services. 2008. http://learninggreen.laschools.org/uploads/8/0/0/0/8000811/school_gardens_as_teaching_tool.pdf.

"What Is SEL?" n.d. Accessed March 31, 2018. https://casel.org/what-is-sel/.

"Whole Child Indicators." 2013. 2013. http://www.wholechildeducation.org/assets/content/mx-resources/wholechildindicators-all.pdf.

Widdersheim, Michael M. 2013. "Critical Communicative Pedagogy: Framing Critical Pedagogy with the Theory of Communicative Action." *Making Connections; Bloomsburg* 14 (2):1-3-10.

Williams, Dilafruz R., and P. Scott Dixon. 2013. "Impact of Garden-Based Learning on Academic Outcomes in Schools: Synthesis of Research Between 1990 and 2010." *Review of Educational Research* 83 (2): 211–35. https://doi.org/10.3102/0034654313475824.

Woodhouse, Janice, and Knapp Clifford. 2000. "Place-Based Curriculum and Instruction: Outdoor and Environmental Education Approaches." ERIC Digests. December 2000. http://files.eric.ed.gov/fulltext/ED448012.pdf

Zimmer, Steven. Interview by Author. 2017.