

Blurring Boundaries and Realizing Just Potential: How Diverse California Schools Enact Sustainability-in-Place

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Abstract

Green schools can reduce negative environmental impacts, promote positive human and ecological health and wellbeing, and promote learning and action competencies for local and global sustainability. This research sought to understand how sustainability practices take shape and unfold in historically excluded schools in California that had received sustainability awards. Using a multiple case study approach, this research highlights ways schools extended their educational practices into three domains of a sustainability-in-place model—community, compassion, and creativity—and also explores barriers to implementing these practices. Some teachers distinguished ideas of care and compassion for student wellbeing as distinct from the practice of sustainability, highlighting the persistence of mainstream, historical framing of sustainability systems. Research implications address opportunities to expand and strengthen green school research and practice.

Keywords: green schools, critical pedagogy, sustainability, social justice, California schools, historically excluded communities, environmental education

Introduction

In a recent special issue of *Curriculum Inquiry* focused on education and ecological precarity, editors Nxumalo, Nayak, and Tuck (2022) juxtapose that “we are drowning in stories of ecological devastation, its disproportionately distributed effects, and colonial governments’ insistence on capitalist extractivism” (p. 97), alongside the “uselessness” of schools as reflected by the growing disconnect between what children need to know and what they are taught. Within this special issue, Solis and colleagues (2022) identified green schools as “a growing movement among school administrators and teachers with the aim of creating healthier environments for young people” (p. 240). Green schools can reduce negative environmental impacts, promote positive human and ecological health and wellbeing, and promote learning and action competencies for local and global sustainability (U.S. Green Building Council, 2023). However, green schools can also “encourage students to participate in their own cultural and physical disappearance” if applied without an accompanying critical pedagogical practice (Solis et al., 2022, p. 240). This disappearance is rooted in environmental professions that have been dominated by White, elitist, and exclusionary practices that have often resulted in marginalization of a wider range of practices that could align with both sustainability and social justice (Sze, 2018; Wald et al., 2019). However, when green schools do integrate principles of critical pedagogy, they can be sites of transformative potential: places that can draw upon community history, story, and strengths to build connections to place and envision a just and sustainable future.

How schools enact sustainability in practice is an empirical question largely dependent upon how school administrators and teachers understand and envision green schools as well as critical pedagogies. Sze (2018) suggests that sustainability must be contextual, and must draw on many disciplines and approaches if sustainability and social justice are to be linked.

The research we present in this article emerged during a course-based research project to explore green school practices in the State of California. In this course, a teacher from an under-resourced school told a story about trying to replicate practices from a much higher-resourced school nearby. The lower-resourced school is set in a community that predominantly identifies as Mexican or Mexican American and has a high rate of socio-economically disadvantaged students. This teacher tried to replicate a balloon ban that had been implemented by a city that is just 30 miles south but is also one of the wealthiest cities in the state. The balloon ban in the lower-resourced school met with resistance at many levels, in part because balloons were an affordable item for graduations and other celebrations for many families who could not afford flowers. Balloons were also more closely associated with community culture. The teacher expressed frustration at what the school to the south could achieve, and said that they could accomplish this because they were “rich and White.” From an outside perspective, this story exemplified the problems with overlaying White sustainability practices onto communities in a somewhat one-size-fits-all mode of practice, and this particularly resonated with the first author’s own experience, as a relative new-comer to a region in which there appeared to be somewhat limited definitions and approaches to sustainability. Practices like banning balloons are responding to the region’s proximity to a

national marine sanctuary, but this story also illustrates what can happen when solutions to problems are imported rather than emergent from local contexts of place.

In contrast, a teacher from an alternative school in California's Central Valley described the transformative impacts of green school practices:

The attendance goes up, grades go up, [it] doesn't have anything to do with the learning in class, I think it's the self-esteem. Once you have momentum going forward, they flourish. Kids in continuation school, they've been pruned too much, they don't really grow. [They've had] adverse childhood experiences, a lot of times it has to do with their ability to grow, their self-esteem. Once you poke through, like a hole in a dam, they've been contained for so long, it's joyful to them, it's like they are flying for the first time.

These very different frames show both the possibilities and pitfalls that schools can experience, particularly in regions where "sustainable" practices are less common.

Our research into green schools in historically excluded communities of California thus sought to explore how schools from diverse geographic locations in the state engaged with sustainability. Our findings suggest that when schools combine ideas of sustainability with place—the local community context and values—a strong ethic of care emerges. This ethic of care both grows from and helps to form a sense of place among the community itself. Green schools are typically thought of in terms of infrastructure and systems on the school grounds themselves, and these are indeed sites for student work and transformation. However, models of green schools can often provide solutions within systems that still perpetuate inequities or White-washed models of sustainability. Sze (2018) identified a research gap in understanding how sustainability and social justice are linked in practice. Our research begins to address this void through a multiple case study approach that explores the framing and practices of California schools that have received sustainability award recognition and that also reflect some of the socio-demographic, racial, and ethnic diversity within the state.

This article begins with background from three somewhat disparate literatures on green schools: green school leadership, critical pedagogy, and sustainability-in-place. We bring these literatures together because they help to explain how schools are finding ways to bring together sustainability and social justice within the context of their communities and place, and these literatures also support an understanding of gaps in integrating green school practices within historically excluded communities. The article then presents case study development and findings and discusses ways to better link green schools, sustainability, and social justice.

Background

David Orr conceptualized academic buildings as pedagogical spaces that could encourage creativity, ecological awareness, ethics, and wellbeing (Orr, 1997). Termed "green schools," these institutions seek to reduce environmental impacts as

well as to facilitate learning about sustainability (Cole, 2014; Kensler & Uline, 2017; Solis et al., 2022). Cole (2014) described possibilities for green schools ranging from interpretive signage or school gardens to complex sustainability systems and policies. Kensler and Uline (2017) articulated ways that schools can engage both the hidden and written curriculum of sustainability, approaches that include not just an understanding of waste, energy, and water, but also relationships with and responsibilities for the Earth and each other. Such an integration would theoretically support a broad range of ways that schools and communities, including those historically excluded from sustainability practices, could define and frame sustainability so that it is meaningful and locally contextualized, thus attending to Sze's (2018) call for building linkages between sustainability and social justice.

However, sustainability often focuses on modifications to rather than radical transformations of systems that have served to degrade the environment, systematically oppress groups of people, and advance educational models that perpetuate these systems (Nxumalo et al., 2022; Sze, 2018). Kensler and Uline (2017) emphasized that school leadership has an opportunity to practice a sustainability ethic that emphasizes people as fundamentally dependent upon and responsible for each other, other species, and future generations. They suggested that this ethic is "not an add-on" but a "new lens through which to consider all decisions" (p. 39). This approach is often called "Whole School Sustainability" and advances the interconnectedness of systems that include buildings, school grounds, school governance and culture, curriculum and teaching practices, adult role models and mentors, and students' own orientations and viewpoints (Cole, 2014; Kensler & Uline, 2017).

While well-designed buildings and campuses *can* support sustainability goals and curriculum, engage teachers and students, and symbolize sustainability commitments (Cole, 2014), the extent that these outcomes are achieved may vary widely, depending on the distribution of resources (Baró et al., 2021) and the extent that these features are consistently used (Zhang et al., 2021). Integration of sustainability education into schools also is limited by teachers' experience with content knowledge and action-focused teaching; perceptions about engaging with controversial or politicized topics; and systemic factors such as high workloads, siloed disciplines, and lack of administrative support (Wakefield et al., 2022). The extent that green schools connect to mental health or other needs of student populations is also an open question. Whole School Sustainability may be a means to achieve social justice as part of sustainability, but it is unclear the extent to which this is occurring in practice.

A critical pedagogy of place is a means to address this gap within education systems because it focuses on local social and ecological contexts while critically challenging "assumptions, practices, and outcomes taken for granted in dominant culture and in conventional education" (Gruenwald, 2003, p.3). Bellino and Adams (2017) articulated the importance of this approach to environmental education because often students who are:

first generation immigrants, the majority youth of color who live in racially, ethnically, and economically diverse communities ... tend to experience traditional EE [environmental education] as something that doesn't explain their personal and complex relationships to their local lived places and experiences (p. 272).

They suggested that critical and participatory pedagogies have transformative potential because they draw upon young people's lived experiences and knowledge. Solis and colleagues (2022) similarly suggest that when employed well, critical place inquiry may serve to uncover systems of oppression that are otherwise "anonymized, community-unaccountable, and ahistorical" in their approach (p. 238). Derby and colleagues (2015) promoted critical inquiry through the questions "What is happening here? What has happened here? And, indeed, what should happen here?" (p. 381). Such approaches to environmental education ask teachers to step into what can be uncomfortable spaces, spaces that are controversial or political, and so these approaches are not always taken (Wakefield et al., 2022). However, under a critical environmental education approach, students not only learn what is happening within their local environments and the underlying causes for this but also what they can do to influence issues that are important to them (Bellino & Adams, 2017; Solis et al., 2022; Wakefield et al., 2022).

Pisters and colleagues (2019) articulate one means to achieve such an approach through a Sustainability-in-Place framework for transformative learning that includes the "embodiment and experience of values, culture and worldview" (p. 1). Their framing focuses on *connection, compassion, and creativity*. Connection recognizes the interconnected nature of life, culture, inner worlds, and multiple intelligences; compassion includes caring for oneself, others, and nature; and creativity recognizes tangible actions that are embedded in place. This integrative framework layers important aspects of sustainability to educational practices within communities that disproportionately experience acute disparities in health and wealth and who sometimes see sustainability initiatives as separate from themselves.

Research Conceptualization

Conceptualization for this research began in 2021, with an environmental studies capstone course that the first author led and in which the third author enrolled. In this course, students researched green school practices in California schools that had received one of four award recognitions: the U.S. Department of Education Green Ribbon School awards from 2012 to 2019 (U.S. Department of Education, 2021); the U.S. Green Building Council Leadership in Energy and Environmental Design: LEED for Schools awards between 2009-2019 (USGBC, 2021); the National Wildlife Federation Eco-Schools program between 2010-2019 (NWF, n.d.); and the National Oceanic and Atmospheric Administration Ocean Guardian School program between 2009 to 2019 (NOAA, n.d.). Each of these programs varies in its structure and goals but each promotes student engagement and learning in relation to sustainability practices.

Stemming from course-based research, the authors of this article conceptualized a study that specifically sought to understand how green school practices were being enacted in California communities that have been “historically excluded” from environmental or sustainability practices.

We set our work within California because it is where we live, work, and play and because California is both socio-economically and ethnically diverse, and promotes environmental literacy in K-12 education. California promotes environmental literacy through state education laws, the California Department of Education Blueprint for Environmental Literacy, and requirements that new school construction meet green building performance standards (CA Department of Education, 2015). We conceptualized “historically excluded” communities as those within California that have high proportions of racially and ethnically diverse populations and high proportions of “socio-economic disadvantage.” The California State Board of Education defines “socio-economic disadvantage” as a sub-group of students who meet any of five criteria (CA Department of Education, 2015):

- both parents without a high school diploma
- eligible for the free or reduced-price lunch program (an indicator of low income)
- homeless
- a migrant
- under foster care

We also conceptualized historically excluded schools as those that seek to “green in the red zone.” This phrase was used by one of our participants to denote regions of the state represented by politically conservative officials and citizens who historically and currently resist or oppose environmental protection efforts including water conservation, climate mitigation, or industry regulation. Importantly, residents living in “red zone” regions of the state do not all share the same political views, and not all residents in these regions experience environmental harms or benefits in the same way. To the extent possible, we used our knowledge of the state’s geography to guide this aspect of school selection.

Research Approach and Case Study Selection

We used a case study approach to develop this research (Barth & Thomas, 2012). We utilized this approach because of the case study’s strength in exploring the “how” and “why” questions of contemporary phenomena and because we were particularly interested in the ways schools framed their work within the context of their geographic and sociocultural contexts. We sought to select multiple cases using purposive sampling in order to explore the phenomenon of green schools as practiced in “historically excluded” communities. Our goal in identifying multiple cases was to identify and interpret findings that extend beyond a single school in order to discover shared approaches and “to explore a new and more integrative interpretation of findings” (Barth & Thomas, 2012, p. 757).

To identify case study schools, we started with a spreadsheet of awarded schools generated from the capstone course research, as described above. We verified all

data and then filtered schools using two screening criteria: i) schools in which 50% or more of students fall in the socioeconomic disadvantage category, and ii) fewer than 50% of students were identified as “White, non-Hispanic” in their racial or ethnic identity. We obtained demographic data from the California Department of Education database (EdData, 2022) using enrollment statistics for the 2019-2020 academic year, which was the most recent data available at the time of school selection (Table 1). In addition to the two screening criteria for demographics, we also sought geographic diversity in terms of location within the state and type of community (rural, urbanized, urban). In order to obtain rural representation, we lowered the criteria thresholds so that we could include School 1, which had received a recognition award but had lower than 50% socioeconomic disadvantage and higher than 50% White in its racial and ethnic composition (Table 1). We added this school after reaching out to the few other rural schools that were closer to the demographic criteria we sought but that declined to participate or did not respond to requests. We also included a school from Southern California (Case 6) that met the sociodemographic disadvantage criteria but whose White racial composition was higher than 50%. In the context of this school, a high proportion of students come from families who are refugees or recent immigrants who identify as White in race but who reflect a different ethnic background and who have experienced migration and trauma from displacement from the Caucasus region of Asia; as refugees, they aligned with our interest to understand schools that serve “historically excluded” student populations.

Table 1. Participating case study schools

| Case Study | # Interview Participants | Geographic Description | Grades Served and Cumulative Enrollment ^a | % with Socio-economic Disadvantage ^a | Racial and Ethnic Composition* ^a |
|------------|--------------------------|---|--|---|--|
| 1 | 1 | Northern California, mountainous, rural | K-12 799 | 29.6% | 61.8% White 32.8% Hispanic/ Latino 3.8% Two or more races |
| 2 | 5 | Northern California, mountainous, rural | K-8 457 | 81% | 89% American Indian or Alaska Native 4% Hispanic/Latino 3% White |
| 3 | 3 | Central Valley, urbanized, alternative school | 9-12 369 | 91% | 76% Hispanic/ Latino 12% White 7% Black or African American |
| 4 | 4 | Central Coast, rural | K-5 594 | 93% | 98.6% Hispanic/Latino |

| | | | | | |
|---|---|---|---------------------|-----|---|
| 5 | 1 | Central Coast, urbanized | 7-8 601 | 75% | 55% Hispanic/ Latino 14% White 9% Asian 8% Black or African American 8% Filipino 4% Native Hawaiian or other Pacific Islander |
| 6 | 2 | Southern California - interior urban | 9-12 1155 | 58% | 82.5% White** 6% Filipino 5% Hispanic/Latino 4.7% Asian 1.3% Two or more races |
| 7 | 3 | Southern California - coastal urban District-level Award | School A. 6-8, 1494 | 63% | 46% Hispanic/ Latino 20% Black or African American 11% Asian 6.6% Filipino 8.7% White 6% Two or more races 1.1% Native Hawaiian or other Pacific Islander |
| | | | School B. 6-8, 1343 | 91% | 76% Hispanic/ Latino 11% Black or African American 8.4% Asian 1.9% White 1.6% Two or more races |

a EdData, 2022

*Due to redacted data, percentages do not all total 100. Categories are presented from highest to lowest percentage by school.

**Includes a high proportion of an immigrant/refugee population that identifies as White racially but are culturally from the Middle East and Caucasus region of Asia

Based on our screening criteria, we identified 23 schools as potential case studies. We reached out to representatives from all 23 schools and invited them to participate in an interview. Of these, seven schools agreed to participate and scheduled interviews. The remaining schools either did not respond at all, declined to participate, or agreed to participate but then did not schedule an interview. Three schools declined because they no longer were implementing sustainability practices due to changes in their school administrators.

To develop these cases, we used award documents and interviews as primary sources. In some cases, other secondary sources were made available to us, such as videos, project reports, presentation slides, event materials, or websites of community partners. These sources supported an understanding of the context of the projects. We were able to make site visits to four of the cases; however, due to

limitations in time and travel during the COVID pandemic, we could not visit the remaining three.

In total, we interviewed 19 teachers, school administrators, and educational support staff affiliated with seven case study schools from across the state of California. Two teachers we interviewed have been recognized with county, state, and national teaching awards. Two schools have worked in environmental education partnerships with the first author, but these projects were paused during the pandemic and time period of research.

We followed a semi-structured interview format in which we asked questions in flexible order in order to allow conversational flow. Interviews generally were via Zoom, 45 to 60 minutes in length, and were recorded and transcribed. Some interviews occurred in person on school sites where recording was not feasible due to background noise. In these cases, we made detailed notes while the interview was being conducted, and these notes served as the transcribed responses to the interview questions.

Our interview protocols asked participants to give an overview of the school's green programs and educational goals, strengths, and barriers; social, cultural, and geographic contexts of the school and its approach to green school pedagogy; if or how the school encourages students to develop a sense of agency; how the school builds connection to student identity and environmental topics; if and how the school integrates ideas of empathy and care into the curriculum; and ways students, staff, or teachers have changed or been transformed by these practices. The research team met weekly and discussed emerging findings as interviews accrued (Braun & Clarke, 2006). In the writing process, all authors read and re-read transcripts from interviews to locate each case within the framework we present.

Our protocols underwent institutional review for Human Subjects Research at university and school district levels as required. Case study development began in July of 2021; we conducted interviews between September 2021 and May 2022. We anonymized schools by removing their names and generalizing their location to broad regions within California that still reflect socio-cultural contexts of place. We refer to all participants using they/them/their pronouns to further anonymize responses.

Research Findings: How Schools Realize *Sustainability-in-Place*

The schools in our study framed sustainability in a diversity of ways, depending on the geographic and social contexts of the school and community. We found that most schools approached sustainability through the blurring of boundaries between community and school and in this way made sustainability relevant and meaningful. The ways schools in our research framed their own practices closely align with Pisters and colleagues' (2019) framework for Sustainability-in-Place. Schools demonstrated *connection*, often to places that were close to home, culturally resonant, and reflecting core community values and needs. They learned the significance of *compassion* by learning to care for oneself, sometimes directly

through the provision of basic hygiene products, food, or child care for teen mothers, and sometimes through learning to see each other as humans who all have strengths and contributions to make. Schools also illustrated *creativity* in the tangible forms of action they took and the ideals they often sought to realize.

Connection: Blurring Boundaries between Communities and Schools

Students and teachers identified issues to address, problems to be solved, or special places to be explored. With the exception of school gardens, schools infrequently explored the sustainable infrastructure at their school, even though some infrastructure (such as solar panels or water filling stations) existed at nearly every school. Schools and teachers often adopted an approach aligned with Derby and colleagues' (2015) critical inquiry: exploring what *has* and *is* happening in their local communities, and seeking to realize a new vision for what *should* happen.

For example, for teachers in Northern California [Case 2], a massive fish die-off 20 years ago was a central impetus for building stronger environmental awareness about the watershed. Over time, teachers and community partners integrated linkages to the history of cultural burning practices, bear safety, birds of prey, farming practices, and water diversions within their educational practices. The initial die off led to a Fish Fair that has been running for more than a decade and increasing its reach to other schools and neighboring communities. In conjunction with the fair, high school students also began to organize a "salmon run" in which the students run a relay race that mimics the salmon migration. In the lower schools, students are exposed to cultural practices such as gathering and cooking acorns in the spring. In the upper grades, students take on organizing and advocacy roles, learning to communicate with local, regional, and state decision makers about water allocation and watershed stewardship. This same school had played a role in developing the Indian Land Tenure Curriculum, which emphasized that "while events are historical, Native people are not" and sought to honor knowledge sources "that are not valued in colonial mindsets." Over time, they also integrated contemporary modes of expression such as hip hop and digital arts into programs associated with this curriculum. These advocacy roles and alternate modes of expression helped youth identify what *should* happen.

Other schools responded to the emerging needs of their community in terms of food distribution. For example, in the Central Valley, students and teachers established a system to support homeless shelters, recovery centers, and community members who were particularly vulnerable during the COVID-19 pandemic. They grew, collected, and redistributed more than 40 tons of food:

We delivered boxes to as many people as we could, people who were fighting cancer, veterans, anybody in economic distress.... In a way, it was a bigger job than I had expected, but the kids were calling places up and seeing if they would donate, they were trying to coordinate who needed boxes. Students were texting each other and asking. I think that's part of the mental health thing that teachers need to focus on... one of the healthiest things that a student can do is to learn to help others. [Case 3]

In Southern California, students expressed concerns and took actions to prevent plastic pollution, promote sustainable waste management, and address air quality and climate issues, both in the school and community. In this district, issues were identified by students, teachers, and sometimes by community members who wanted to improve the quality of life within the neighborhood. One school in this district also established a food redistribution program to collect uneaten cafeteria food and redistribute it through an existing non-profit. In this way, their school invited the community in to create a space to learn and foster new connections as well as limit food waste and practice sustainability. Just prior to the COVID pandemic, 24 of the 85 schools in this district were partnering with the same food redistributors [Case 7].

A teacher at another school in this district also maintained a school garden. While the garden was started by volunteers, upkeep is tended to by the teacher, their students, and a local church, with compost created from food scraps collected by students at the school. The creation of a garden for educational and leisure purposes was initiated by an outside family when the local community garden shut down. However, the teacher now utilizes the garden to welcome their school's "newcomer class," comprised of students who have recently arrived in the U.S. Students literally enjoy the fruits of their labors that are created from donated loquat trees and other plants from family members [Case 7].

In geographic areas where political views sometimes conflict with environmental goals, schools also identified "common ground" issues, which connected community values and environmental concerns. For example, one teacher described that:

Almonds are number one here. At some point there's a tipping point where your pollinators aren't [going to be] there. It's going to hurt you. So we're going to try to bring in that community and say look, this is one issue where 'blue' and 'red' can get along together. Because if you don't have bees, you don't have agriculture, which means you don't have businesses, and the blue side understands that pollinators are important for the ecosystem. [Case 3]

While research participants most often were focused on the projects themselves, they sometimes paused to reflect on the significance of these community connections for learning or for longer-term sustainability. One community partner reflected that "Protection forever means that you have the support of the people around you who live in this area..., and I think without that type of shared understanding and shared ownership of a place, I don't feel like a place is actually protected." [Case 4]. Another described the sustained effects of community connectedness:

It's interesting that our families and our students tend to stay close to home [after graduating].... I think about that too, and how it ties into a green focus, I mean when you think about people kind of staying in their community that's kind of a big deal, you know, they're not traveling all over.... They're staying with their families, they're being committed, working in the community. [Case 6]

This administrator reflected that “there’s a lot of wisdom” in staying close to home, because it provides “a pathway within the family” to model “someone who’s done it and been successful.” They suggested that this modeling is important in helping the students believe that they can be successful, too. They linked the school culture and community activism this way:

I mean our kids are very politically active. There’s a very strong [ethnic] community here, and this is the one-year anniversary of the conflicts in [homeland]... and students are getting together [to organize actions].... So it’s all of those factors together: the school culture of constant improvement and focus toward the future but also... the family and community and cultural dynamics of... ‘you don’t just sit idly by, you do something.’ [Case 6]

Schools in historically excluded communities often draw on community assets and serve as a community hub or resource. However, research literature and sustainability education do not often make these connections. These case examples serve to bring community connections into the research literature about how green school sustainability and social justice can be linked.

Compassion: Integrating Care into Sustainability Practices

We found some instances in which teachers distinguished ideas of care and compassion for student wellbeing as distinct from the practice of sustainability. Teachers sometimes perceived “sustainability” and “environment” as distinct from basic care, food, and health. One teacher in the alternative school began to describe it this way: “The textbook definition of sustainability and how it is used in society and industry, is pretty far-fetched [for these students]. You can’t save the planet; you can’t save today...” A second teacher interjected: “...when you are trying to eat” [Case 3]. All three teachers emphatically nodded their agreement to this. The teachers at the alternative school each approached sustainability through issues with which students were already familiar, such as food insecurity: teaching them how to grow food, looking for inspiration from Ron Finley¹ and community gardeners, distributing food to others who were sick or at risk during the pandemic. The teachers were intentional in tailoring their approach to sustainability:

Sustainability, to be honest, is a secondary value for them. They hear it but they’ve never experienced it. From home to community, they haven’t seen it. Living in at-risk communities (on the EPA index²), it is really important that we first connect to employment and then to reiterate that there is also a higher moral purpose, so it goes from: ‘Oh, I’m helping someone,’ to ‘Oh, I’m helping the planet; I’m helping the community.’ They begin to see you can do both. [Case 3]

¹ The Ron Finley Project is focused on community-based transformation of food deserts into food sanctuaries through Gangsta Gardening. <https://ronfinley.com/>

² The California Office of Environmental Health Hazard Assessment database scores the city in the 90th percentile for cumulative environmental health burdens, primarily from poor air and groundwater quality (CA OEHHA, 2023).

A teacher in Southern California established a "Giving Closet," which collects donations and redistributes clothing, hygiene products, school supplies, and other basic goods for students who need them. This teacher stated that: "I get kids coming up to me and asking me for stuff every day: 'Do you have deodorant?' 'Do you have pants [because] I don't have any more'...." When we asked if this teacher saw the Giving Closet as addressing sustainability (such as through its social, wellness, or economic contributions), they said, "no, because it's not environmental," but then without pausing further, this teacher proceeded to elaborate the significance of these supplies. She gave an example of a student whose menstruation began at school and who was bleeding through her pants:

... About a month ago one of our kids that's a tougher student... [came] to the Giving Closet, and I get her pants, and she's not wearing [a] uniform shirt. I said, you need a shirt? She says 'yes.' I ask, how many do you have at home... [Case 7]

Remembering this exchange with emotion and some tears, this teacher elaborated on this student's eventual acquisition of a variety of clothing, school supplies, and toiletries on this day. This same teacher later set up used clothing redistribution events in the library, with about 100 students attending each time. This teacher saw clothing redistribution as sustainable, but not the initial Giving Closet in part because of the plastic packaging associated with some of the products. In instances like these, teachers were applying their own compassion and care for their students' wellbeing but did not directly connect these practices with ideas of sustainability. These distinctions reflect a limitation in the way sustainability has historically been framed or enacted in mainstream narratives: work that supports environmental health but not care for people. This teacher later clarified that ideally, systems and production of goods would support integration of both.

Case study schools were much more likely to describe *compassion* as a part of sustainability when it was connected to the ecological, biophysical world. In some cases, connection could be through a school garden or in wanting a less-polluted community. Schools with access to natural areas described building connections to places, plants, and animals, and to seeing these as part of a larger community:

I think it can be a sense of place in terms of 'this is my community, this is where I live, I know these people, these are my friends.' And taking that sense of place, but expanding it: 'This is my community, and this is our backyard,' which is an open, wild space... it expands their view of community. [Case 4]

Facilitating these connections was important to teachers because the students in these schools, despite living near natural areas, did not have much direct experience with nature. Schools also described ways that students were learning to see more direct connections between human impacts and ecological communities:

Over time, it instills a pride in them, that they live in a special place, a diverse place, and that they are responsible for animals that can't speak for themselves. [You hear] kids telling daddy 'we shouldn't dump our trash,' or 'we should clean the fish by the river' (so the bears won't come and have to be shot), or 'we shouldn't waste the deer meat; we can give it away.' [Case 2]

In the suburban Southern California school that sits at a wildland-urban interface, teachers and students applied GIS to understanding emergency responses to human-caused wildfires by mapping houseless camps and vegetation because in the heavy brush, "if somebody starts a fire... they are all going to pay the price...." The teacher described this as "curating partners, being responsive to what kids wanted to do" [Case 6]. These cases suggest a need for stronger framing of sustainability that can demonstrate and link care for each other and care for home, place, and the planet. Many teachers were making these linkages themselves, and working toward these connections with students, but others seemed unsure if their projects and work were directly supporting sustainability.

Creativity: Realizing "Just Potential"

While participants in our research described educational practices that can benefit many students and learning profiles, they highlighted particularly the educational benefits for students who thrive in these contexts. We term this outcome "*just potential*" because it is a form of educational justice and equity in which students are able to realize their potential for learning and growth. When green schools can center communities and youth as a part of their pedagogy, "just potential" is more likely to be achieved. "Just potential" identifies a particular kind of transformation that comes for students who might not perform well in a traditional classroom setting but appear to thrive in green school settings where student agency is emphasized. We derived this term from Agyeman, Bullard, and Evans' (2003) "just sustainabilities," in which sustainability is inextricably tied to social justice. We see just potential as the individual manifestation of just sustainabilities in educational spaces. This theme often was articulated by case study schools in one of two ways: the impacts on individual students who do not perform well in traditional classrooms, and the collective agency that students realize by advocating for school, community, and sometimes policy change together. In terms of individual impacts, one teacher reflected that:

It's just pretty amazing to see the kids who really struggle in the classroom academically. They tend to be the ones that just shine in that setting and doing this kind of an activity. And it's a way for them to feel successful at school in a way that they don't usually feel. [Case 4]

Teachers and administrators also articulated a collective sense of agency, through project-based learning or after-school programs. Collective agency was realized through projects that addressed water allocations and salmon health [Case 2], food redistribution [Cases 1, 3, 7], or waste diversion practices [Cases 1, 6]. Many of the schools emphasized that "it's not always been the strongest, most academic, kids in the world, but a team of, you know, diverse students, genders, identities,

different backgrounds” who have been successful in accomplishing this work [Case 6]. In the context of the Southern California urban school district, students across schools were involved in clubs to improve the schools’ waste management practices, including taking the recyclable waste to the curb for pick up, actions that were required by law but that custodial staff were not doing. The clubs worked together to gather evidence about the state’s waste management laws and how the schools were not adhering to these. They presented this evidence at a school board meeting:

We had all these kids do all this research [and] figured out that the district was breaking all sorts of laws with our trash, with our waste pick up, our hauling, our sorting, everything. So we have all these little sixth graders go present at the school board and tell them that they’re breaking the law and they’re like, ‘Oh.’ So that’s when we created this whole thing, [Club Name]. And from there we were on a huge roll. We had like a million-dollar budget... It was awesome, it was so exciting. [Case 7]

One of the teachers from this district described the benefits of this collective work:

I think that, you know, [it] kind of spreads out too, that they need to have this, and in a bigger way, and in a more community-based way, that they are making a difference. Even if it’s small, it does make a big difference. [Case 7]

When teachers would describe these types of benefits, they invariably lit up with a sense of joy or accomplishment. Realizing just potential often seemed to be a motivator in continuing their projects, despite the extra effort this work often entailed. Because sustainability so often focuses on systems and systems change, just potential is particularly important, as it emphasizes individual transformations that are central to educational practice. When sustainability issues and critical pedagogy practices were explicitly woven into their teaching and schools, teachers were able to realize just potential with individuals who do not respond well to traditional educational practices.

Barriers to Realizing Sustainability in Place

While case study schools have accomplished a diverse and impressive set of actions, our participants also spoke of many barriers to realizing their visions. These include lack of leadership support; curricular constraints; perceived and real safety concerns; insufficient or unsupportive facilities staff; high rates of turnover; and a lack of time to think, plan, innovate, and implement all the ideas they have. Constraints from leadership included lack of sustainability mindsets, apathy, and competing priorities. These constraints call on the need for creative and persistent solutions to sustainability through direct engagement and interaction.

For example, without support from their district as a whole, teachers felt as though their work diverting food waste from Southern California schools was futile: “It’s very frustrating that it’s of no importance [to the district]” [Case 7]. These views, that there should be more systemic support, were expressed by multiple teachers from the district despite the district having received awards and national

recognition for this very work. Similarly, one case study school described having to navigate opposing viewpoints among the families and school staff. In the context of state-mandated organic waste collection (S.B. 1383),

Some are like 'It's a law, we have to do it, but let's just put containers out there and tell the kids to separate it.' We're talking kindergarteners, first, and second graders, right? And some are saying, 'Don't teach the kids how to do it right; we want to get away with not doing it right.' And [then there's] the polar opposite, like, 'Let's make signage and containers and really teach everybody.' And yet it's the same state law [Case 1].

Another teacher described being reassigned from her leadership roles because the White administration did not support the extent of Indigenous integration in the lessons and structure of the program. Whereas the previous administration had supported arts integration and valued the development of structures that could support cultural knowledge, the current administration has led to high turnover, a “perpetual year 1 for everything,” and a “toxic” feeling that “affects morale.” This teacher went from coordinating successful initiatives both in and outside of school to solely being in the classroom where they were less able to realize some of the ideas that most resonated with their students [Case 2]. Each of these teachers, while expressing frustration and anger, also identified, through their connections and compassion, ways that they could creatively enact sustainability in place.

While mindsets were the most commonly expressed barrier, some schools in our research had access to more funding, resources, and partnerships than others, and this of course has significant impacts on the types of teaching and educational support possible at those schools, with noticeable differences by region and proximity to communities that host more resources. For example, the suburban Southern California high school, while serving students from diverse socio-economic backgrounds, is located in a region that is rich with resources and referenced the support of entities such as CalTech, ESRI, and the film industry, which have provided mentoring and services to their students [Case 6]. In contrast, some schools had a harder time securing funding, resources, or social capital because of their more isolated locations. A community partner reflected on the importance of partnerships in providing social capital, and the limited pool available from which schools can draw: “It’s really important to acknowledge that in these rural areas, there’s just not that many groups that would take the time and effort to own this place and say that they’ll put the time and effort in here” [Case 4].

Teachers did not often apply critical pedagogical practices explicitly; however, they applied these practices frequently, but often implicitly, when they navigated unsupportive systems. Teachers sometimes referenced practices that emerged in real-time, such as navigating responses to a major natural gas leak, a lawsuit related to water contamination, or failure to respond to new legislation as it rolled out, such as with S.B. 1383, state-mandated organic waste collection. Teachers’ abilities to incorporate critical inquiry into their work often were tied to time, especially during the pandemic when this research was occurring; teachers did not have the luxury of time nor resources to identify ways to more intentionally build

critical pedagogy into their work. However, because of the unsupportive systems they worked within, they often found themselves supporting students in critically examining ways to navigate system push-back, often on the fly. Finding creative ways to realize “just potential” then transcends individual, collective, and systemic actions for change that help to realize greater equity, health, and responsiveness to community-identified concerns.

Discussion

We began this research because we recognized an inherent disconnect between the ways that some teachers understand sustainability, try to apply dominant sustainability paradigms and solutions within their schools, and then feel frustrated when they receive push-back, as in the case of the balloon ban that we described in the introduction to this article. By exploring a range of contexts in which schools have been recognized as award-winning, and also defining for themselves what it means to be sustainable in their communities, we hope to provide narratives that can inspire future research and practices. We see this research as providing three central contributions to a more just green school pedagogy:

Green School Awards

While we were able to identify strong case examples for how teachers, and sometimes administrators, were reframing sustainability in the context of historically excluded communities, these were award-winning schools. This means that someone had the time and resources to identify, develop, and write up sometimes complicated proposals for how their school was meeting sustainability goals. In California, the annual awarding of Green Ribbon Schools designation explicitly includes one socio-economically disadvantaged school. This is an important practice as it rewards a more diverse range of practices and framings of sustainability and begins to build a range of models that other schools and teachers might draw inspiration from. Most of the award programs were flexible in the way that schools could self-identify how they were meeting sustainability criteria. This is a strength of the award programs because to a certain extent, it allows schools to define for themselves what sustainability means in the context of their community, while still hitting more traditional benchmarks of sustainability that reduce harmful environmental impacts. Only the Green Ribbon School awards recognized health and well-being as an explicit aspect of sustainability in their award criteria, and the schools that received these awards tended to be more expansive in the range of ways they defined sustainability. This was particularly true when individual schools, rather than a district office, received the award.

Green School Leadership

While Kensler and Uline (2017) provide a compelling argument for the importance and opportunity of school leadership to support Whole School Sustainability, we did not find many models of this. The only school in our research that seemed to fit this context was Case 6. Other schools had mixed support from administration, and still others received significant push-back from their administrators who were often reinforcing top-down models of education that relegate sustainability as an add-on, not a holistic transformation. These barriers highlight the importance of critical pedagogy in navigating oppressive systems of power.

Critical Pedagogy

In some cases, teachers were not sure if their work could be defined as “sustainability.” In these contexts, teachers were often reflecting larger, systemic issues of exclusion from mainstream sustainability. Sometimes their reflections were similar to those articulated in Wald et al.’s (2019) *Latinx Environmentalisms*, in that from an environmental perspective, actions such as transforming the food system through local distribution or supporting basic needs clearly align with sustainability goals, but the teachers enacting these practices did not always see their actions as aligned with sustainability unless they connected with environmental protection. This could be because their own training has not made those connections explicit, or because the field itself has not provided sufficient models for what sustainability education looks like in the context of a more diverse set of communities and schools. By definition, historically excluded communities have not been well represented in sustainability education literature. This does not mean that they have not been practicing sustainability. Many models for transforming environmental education promote storytelling or counter narratives that challenge dominant narratives that have served to “devalue or erase marginalized citizens” (Miller, 2017, p. 848; Nxumalo et al., 2022).

Our research begins to fill this gap by showing ways that a diversity of schools frame and practice sustainability. Future research could also articulate, from teacher and student perspectives, how lived experiences serve to push boundaries of what sustainability practices can and should be. With the exception of Solis and colleagues’ (2022) publication, our review of the green school literature found this to be a significant research gap. Other research on climate justice may be serving to fill some of these gaps between sustainability and social justice, but much of this literature does not explicitly connect with green school practices. We found the linkages to Pisters et al.’s (2019) model useful because it specifically brings in ideas of connection, compassion, and creativity that resonated with the narratives we heard.

Conclusion

The schools in our study framed sustainability in a diversity of ways, depending on the geographic and social contexts of the school, as well as the issues that were most salient in their community. We found that most schools approached sustainability through the blurring of boundaries between community and school and in this way made sustainability relevant and meaningful. This may not be new to the communities themselves, but sustainability, with its focus on systems, has not historically recognized these connections as important.

For example, we found some instances in which teachers distinguished ideas of care and compassion for student wellbeing as distinct from the practice of sustainability. These distinctions reflect historical framings of sustainability as work that supports environmental protection but not care for people. However, the teachers, administrators, and community partners we interviewed all identified the promise of educational innovations in expanding students’ horizons and providing opportunities to imagine new possibilities for themselves, their lives, and communities. They demonstrated a variety of ways that they are enacting environmental and

sustainability pedagogies. As presented herein, schools in our research framed their own practices in ways that closely align with Pisters and colleagues' (2019) framework for Sustainability-in-Place through their emphasis on connections, compassion, and creative solutions that emerged from place. Teachers expressed excitement and were motivated by times when they could transform the system, work with students to express care and compassion for each other or community members as well as the more-than-human world, and for moments when they were achieving what we describe as *just potential* for students who particularly benefit from transformative school practices.

While calls for more integrative teaching have been made for decades, these practices still are hard for committed teachers to realize. As Kensler and Uline (2017) suggested, the challenge is for school leadership to learn, support, and practice a sustainability ethic that emphasizes people as fundamentally dependent upon and responsible for each other, other species, and future generations. Teachers in our research demonstrated a range of ways they were seeking to accomplish this. However, despite California having mandates and structures in place to support the integration of environmental literacy in schools, our interviews identified that even within schools that have received recognition for green school practices, teachers often felt isolated and that they were working against the grain to realize the potential they envision. Despite these barriers, teachers and administrators demonstrated commitment to sustainability practices that were culturally and socially resonant, that fostered a sense of agency among their students, and in which students could realize their just potential. Both green school award systems and future research need to elevate narrations of these practices so that the field recognizes, rewards, and promotes a broader range of ways that green schools are framed and enacted.

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