

Notes from a Field: Reflections on Space, Gardening, and Student Learning in Southern California

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Abstract

The impacts of gardens are often much larger than the produce grown in them. This paper reflects upon and discusses the broader impacts associated with a garden tied to a geography class about food systems. The project was initiated by students and supported by campus faculty, administrators, and staff over the past eight years. The project's connections to ongoing debates about the history and roles of gardens in general and campus gardens are considered. Both student evaluation data and the instructor's observations over eight years suggest that the readings and discussion, combined with student participation in garden development and the regular tasks of gardening, extend student learning and may promote emancipatory work.

Keywords: Campus agricultural projects, experiential learning, food system education, higher education, learning outcomes, program development, sustainability education

Introduction

A GARDEN AT CALIFORNIA STATE UNIVERSITY SAN MARCOS sits in a distant corner of the campus behind a childcare center on an as-yet-unused road full of rocks and clay that is usually traversed only by rats, rabbits, gophers, coyotes, deer, and the occasional rattlesnake (Figure 1). The garden shares many of the challenges of similar efforts such as poor soil, inconstant water, and sometimes tenuous institutional support. Over the past eight years, this garden has become a central dimension of an undergraduate geography course titled Food Systems and Emerging Markets. The addition of the organic garden has changed the class significantly. With the garden, the course asks students to engage with food on both an intellectual and material level. They take part in the usual reading, discussion, and paper writing, but they also collectively grow food, eat said food, and develop and maintain the garden space. At the outset, I anticipated that the garden could serve as a rough analogue to an urban garden, except that the garden is located on a suburban commuter campus

in Southern California. However, the garden has come to play an important role in connecting students to their food and inspiring some to engage in activism or seek out new leadership positions on campus (Figure 2).



Figure 1.—The site of the Sustainable Food Project at California State University on an unused road on the eastern section of the San Marcos, California, campus. Source: author

These reflections and observations are based on eight years of student interaction, mentorship, and evaluation as well as my own experience with the project. Since 2012 I have been the instructor of record for the main class cultivating the garden. For much of this time I have been the primary faculty proponent of the project. A committed participant observer, I have worked side by side with students to dig the holes; build raised beds; install, patch, and rebuild the fence; negotiate with the campus bureaucracy; cultivate partnerships; and attend to myriad tasks associated with maintaining the project space. My experience leads me to conclude that students' participation in the development and maintenance of the project has been critical to their learning experience in the class. In this way, the paper contributes an account of the potential outcomes and opportunities of incorporating experiential work into food systems curriculum in geography.

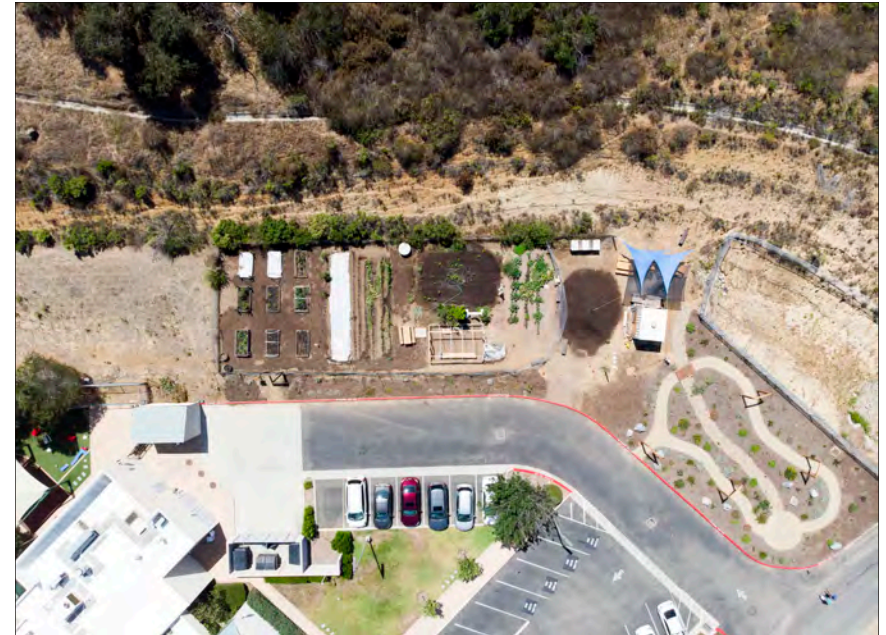


Figure 2.—The garden now includes a student-led pollinator garden in the lower right-hand corner and adjacent to the parking lot (center of photo), in addition to the produce garden. Source: CSUSM

The Uses of Gardens

The impacts of gardens are often much larger than they appear because their effects extend well beyond the obvious purpose of growing food. In this review, I start first with some observations on a garden movement in Denmark to suggest how gardens evolve over time. Literature on gardens suggests a range of gardening practices around the world often have larger effects beyond just food provisioning. Literature on school gardens suggests there are similarly diverse and larger outcomes. In short, as with gardens in non-educational settings, campus gardens may promote a range of educational and political effects on participants. The recent literature suggests that creating the space for gardens is an important dimension of this process; however, I have found that student participation in both creating and maintaining the garden space is also important for student learning and broader project outcomes.

Among the more interesting gardening examples are the *Kolonihaver* of Denmark (Figure 3). *Kolonihaver* are allotment gardens in which gardening associations lease public land for their members, and members own any structures they might construct. Introduced in the 1700s, they involve thousands of families across the country today; the national **Guthey: Notes from a Field: Reflections on Space, Gardening** 99

allotment garden association, *Kolonihave Forbundet*, counts approximately 40,000 members. *Kolonihaver* may be found along rail lines, highways, and inside many public parks. Today, some of these gardens have been converted away from food production entirely, can be quite expensive, and in some cases may even function as year-round, unauthorized tiny houses. The Danish example is interesting because it illustrates how markedly gardens' uses and purposes may evolve over time, and suggests some of the broader outcomes that gardens may catalyze.



Figure 3.—*Kolonihaver* in the Nørrebro section of Copenhagen, Denmark, in summer 2017. In the foreground is a garden devoted to flowers. Source: author

Examples in the literature provide further support for this dimension of gardening. Reviewing the uses of school gardens in Ireland, Forrest and Ingram (2003) explain that gardens were widely used around the world in early childhood and primary education in the late nineteenth and early twentieth centuries. They point out that in the early twentieth century, gardens were geared toward teaching students “scientific principles.” It was also thought that a garden curriculum would provide students the opportunity to develop “mentally, physically, and morally” (Forrest and Ingram 2003, 82). In another example, the Women’s Land Army of America during World Wars I and II sought to establish liberty (WWI) and victory (WII) gardens to supplement diets, but also to support the war effort and wartime nationalism. These efforts also somewhat

inadvertently changed the ways in which women viewed themselves and their relationships to society (Gowdy-Wygart 2013).

Today, gardens continue to serve larger purposes at the same time that people grow food in them. Detroit, Michigan, which has imported all its food, uses community gardens as a revitalization strategy (Colasanti et al. 2013). Leah Penniman (2018, 208) provides a case study of D-Town Farms, a seven-acre urban farm in the city providing a range of heritage crops as well as farming education for local residents. Cuban home gardens have been interpreted as a means of increasing resilience in social-ecological systems since the collapse of the Soviet Union in 1991, U.S. trade embargoes, and subsequent narrow government programming focused on staple crops (Buchmann 2009). In Zagreb, Croatia, gardens fulfill a range of urban needs, including providing home-grown food (Borčić et al. 2016). And amid the COVID-19 crisis, gardens are noted for the ability to increase food security at a time of food shortage (Lal 2020).

In non-educational settings, community gardens have been shown to allow for a range of educational processes to unfold. Walter (2013) provides a good overview of the ways in which his understanding of “social movement learning” in community gardens involves elements of liberal, progressive, humanist, and radical adult education. These include teach-ins, the study of environmental issues and technical knowledge, and hands-on learning, among others. What Walter (2013) notes as “social movement learning” is a form of what Freire calls *concientización* (“consciousness-raising”). Cody (2019, 113) shows how this process unfolds in a Peruvian context where growing food in a community garden leads participants to learn about conventional agriculture in their region, develop respect for the garden organizers’ knowledge and experience, and develop skills through gardening themselves.

Similar gardens are increasingly popular on college and university campuses (Bartlett 2011; LaCharite 2016; Mendes and Nasr 2011; Weissman et al. 2012). Here too we find that gardens have larger goals than food production. One frequently noted thread among the various campus efforts is resisting or in some way contending with modernism, urbanization, and contemporary capitalism. For example, Swords, Frith, and Lapp (2018, 264) see their community-campus project at Ithaca College as “a way to challenge systemic inequalities through engagement with the food system” (see also Smith and Kurtz 2003; Baker 2010; Eizenberg 2011; Peach et al. 2020). Providing alternatives to the industrial food system is a consistent and recurring theme (Ralston 2011). If anything, however, campus gardens today connect to a broader range of issues, from increasing interest in agriculture and food systems to

addressing the long-term impacts of climate change, colonialism, and inequality; from increasing environmental sustainability to healthier food choices and student food security (Bartlett 2011; Taylor and Lovell 2014).

Because university students are at a particular moment in their lives where habits and beliefs may become set for life, participation in garden projects while at an institution of higher education may promote long-term changes in participant behaviors and understandings (Laycock et al. 2018). They may lead to community action on the part of participants and subsequent increases in critical thinking and lifelong learning (Gray et al. 2012). Students might also learn the value and benefits of small-scale regional and local organic production of food and an associated range of environmental benefits (Burns and Miller 2012). The range of benefits of university community gardens include education, increasing pro-sustainability attitudes and behaviors, confidence building, community building, and improved food security (Laycock et al. 2018).

Some scholars are wary of the implications of similar projects. For example, exploring attitudes among students volunteering for urban agricultural projects at UC Santa Cruz, Guthman (2008) notes a range of ways in which they may reinforce exclusionary practices, understandings, and framings in food movements. Questions of what kind of alternatives are on offer rightly persist even as momentum to develop similar gardens continues (Alkon and Guthman 2017). The outcomes of gardens depend on how they are executed, as Penniman (2018, 2) points out that many food movement organizations are white dominated, their leaders considering questions of equity as irrelevant. Gardens respond to waves of restructuring and redevelopment but can include sometimes overly prescriptive curricula (Pudup 2008). Yet Hayes-Conroy's (2010) comparison of two school gardens—one in Berkeley, California, and the other in Nova Scotia, Canada—reflects the complexity of garden outcomes, the rigidity and scripted nature of school garden curricula, and the ways in which they might reproduce and reinforce existing neoliberal responses to economic restructuring and social change. However, she takes a more materialist and hybrid approach that sees diverse outcomes resulting from bodily experience in gardens. Hayes-Conroy argues that garden pedagogies may help students “counter and disrupt the unequal conditions in their lives that free market capitalism has engendered” (2010, 88).

Bartlett (2011) sees today's campus projects as part of an effort to create civic agriculture, arguing that they can “go beyond demonstration projects and public education to have significant political and economic impact

on the agri-food system” (102; see also Lyson 2004). Ott (2015) points out that gardens are perceived to accomplish civic values, community, and environmental health. Such gardens may also have the potential to promote citizenship (Krasny and Tidbull 2008; Bendt et al. 2013; Ghose and Pettygrove 2014) and may help to re-skill farming workforces, which is a critical need today in the context of an agricultural system that has gutted rural communities over the past several decades (Carlisle et al. 2019; Cramer et al. 2019). Gardens and urban agriculture may expand understandings of past and future alternatives to the industrial food system, transform living spaces for the use of those who cultivate them, sustain and diversify cultures and cultural understandings of who farms, and provide a variety of different types of foods while teaching participants how to grow it.

One of the best examples of this dimension of the literature comes from Trauger's (2017) work in Europe and North America. Through a food sovereignty approach, Trauger combines critical perspective on urban agriculture with radically individual action to counter dominant trends food systems. Food systems constitute a powerful force, as Fraser (2018) points out, but individual action remains significant and vital to reshaping “global foodscapes.” Trauger argues that the right to food is a David-and-Goliath struggle that pits regular folks against the state and its corporate backers. What is most interesting is how central space is in Trauger's analysis. Resistance to the industrial food system and the practice of food sovereignty involve people taking action by creating spaces. These spaces include diverse forms of urban gardens, community gardens, urban farms, and other formations.

These spaces do not necessarily have to last a long time. In fact, Trauger points out that the efforts of food sovereigntists are, in her experience, often “partial, contested, capillary, and networked” (2017, 4). In many ways, the process of creating these spaces is an ancillary goal. For people to have control over the food system they use, they need to create spaces that they control and regulate. Quoting Lefebvre, Trauger writes that “sovereignty implies ‘space’” (2017, 3). What that means in the context of food is that activists must seek out spaces of all sorts to grow food. Land—either owned, borrowed, or taken—provides people with the ability to grow crops, hope for the future, learn, and live. This view is necessarily open-ended for Trauger, who quotes Massey's position that space is neither fixed nor absolute. Space is always in a process of being made—she calls this “radical collectivism”—by people through a process (and politics) of collaboratively altering already existing spaces (2017, 4) into potentially more liberatory and human-oriented geographies.

Something similar is happening in the class garden at CSU San Marcos. Over the past several years, as a proponent of a class-based garden, I have been struck by the notion that creating the space for garden has been just as important as the actual production of food, particularly with respect to student learning. Such a viewpoint is echoed in the literature. Laycock et al. (2019, 2) note that education and pro-sustainability attitudes and behaviors are among the more notable benefits of campus agricultural projects, and that food is in some ways a secondary benefit. But they do not mention the student-led creation of the garden space, which seems to be an important component because it presents a variety of possibilities and futures. After all, without space for a garden, there would be limited potential for the same sort of engaged, hands-on, experiential learning or the subtle reconnection one experiences with food that results from participation in such a process.

When students participate in the construction of the garden space itself, the level of engagement and incorporation into the project increases. Creating the garden space forces students to engage with one another, with the powers that regulate gardens, and with the challenges gardening sites themselves can raise. This engagement also leads them to take ownership of the space and tend not only the garden but their relationships with the garden, with food, and with one another. Creating the space while reading about the food system provides an additional way to reflect on and discuss with others the dynamics of the food system and gardens.

Indeed, there are several results stemming from student participation in the creation of the garden space which have a lot to do with students' personal experience of the space. Hayes-Conroy (2010) notes that bodily experience in a garden leads to diverse outcomes. In Whiteman and Cooper's (2000) work on "ecological embeddedness," physical connection to and experience with nature influences decision-making and practices of sustainability. Turner (2011) would call this "embodied engagement" with the garden, as it involves both occupying and working in the garden and ingesting its produce. Walter (2013) writes, "The experience of seeing where food comes from, of expanding an understanding of the immense variety of edible and flowering plant species available to eat, of learning how plants develop and grow and are eaten, may also be a revelation to community gardeners—an 'environmental act' which raises environmental consciousness towards a more eco-centric worldview" (530). And Liu et al. note that "it is individual bodily experience of a farm or garden that impacts at a deeper psychological level" (372).

Such seems to be the case in this project. In the following sections, I highlight three different phases of the project: its initial conception, the

garden's current status, and its future prospects. My intention is to highlight the role of student participation in creating the space for food cultivation. Their participation varies with the needs of the garden itself but involves students making smaller and larger decisions about the garden every semester. Student involvement in the material development and cultivation of the garden, along with its focus on site improvement and sustainability, has been important to the longevity of the project. But most important have been the impacts such participation have on student learning.

Project Origins

Apart from the usual inspirations, such as UC Santa Cruz's Center for Agroecology and Sustainable Food Systems, Alice Water's Edible Schoolyard in Berkeley, and related school gardens, students enrolled in Food Systems and Emerging Markets formed the main impetus behind the CSU San Marcos garden. During early versions of the course, students expressed interest in creating a garden. They lobbied to move the class outside and find a way to grow food on campus. I interpreted their interests as the result of a class where students found themselves learning about food and its relationship to the environment in classrooms with no obvious connection to the actual environment. At the time, our classroom had only one small, locked window, and most students commuted long distances to campus, often amid heavy traffic.

The students' energy for a class garden aligned with my interests in a thematic module on food justice in the course—thus, a second reason for the project. My aim in the class has been to encourage students to think about food in a systemic way, and about how food systems incorporate inequities and differential accesses to food. I thought building a garden together might further stimulate this sort of thinking and provide a concrete example of an alternative to industrially produced food. Building the garden space forced us to work together, find partners, consider the design of the space, gain experience with various tools and with nature, and come to understand the garden space as something that needed maintaining beyond just growing food during the class. Each semester, students maintain their own gardens, or work collectively on sections of the garden, or both. Students can grow whatever they like and choose from a wide variety of crops to grow, such as kale, tomatoes, okra, basil, squash, cilantro, parsley, onions, radishes, and mint. Any food produced is either consumed by students themselves or given away to all comers. In the context of a class about food systems on a campus lacking any similar courses, growing any food at all seemed a worthwhile goal since many students who enrolled in the class reported that their parents shopped and prepared their meals, or that they often bought food from any number of fast-food restaurants. My understanding of where many

students get their food comes solely from what they report in class discussions and in informal conversation.

A third reason to initiate the project related to student access, curricular efficiency, and reliability. Most students in the class have limited experience with farms, based on what they have told me during field trips. This reflects the distance many have to the production locations of food. Additionally, for first-generation college students, who comprise a large segment of the university, the objective may very well be to build careers outside the agricultural sector. And field trips are not always available to every student because of time constraints, full-time work, and class scheduling. Thus, a campus garden would provide an experience similar to that of a farm tour in a more convenient location. The campus project also would afford a richer, more frequent experience of growing food in a region known for its diverse, small-farm agricultural base, in effect transforming all students into participant learners in San Diego's small-farm economy, if only for just a semester.

With these motivations and support from colleagues, I crafted a first proposal to develop a campus farm project. To illustrate the intentions at the outset, I quote from the original proposal for a small successful internal grant used to start the project:

Imagine a university campus where students, faculty and community members farm food, and while doing so, also learn about food, science, technology and math. And the food they grow feeds not just themselves, but other students, prospective funders and the neighbours. A garden of this sort could train future teachers how to integrate STEM goals in K-12 education and it could provide for collaborative work among faculty in different colleges. A campus initiative of this sort could inspire entrepreneurs to develop new ways of supplying food to county restaurants and bolster the third largest sector of the county's economy. It could inspire students to consider graduate education in agriculture or encourage them to create new social justice organizations out of whole cloth. It could also elevate the training of undergraduate students in tourism and hospitality. And it could work to address crises in obesity and diabetes in our service region, on tribal lands, and in area cities. An initiative of this sort could be transformative on a number of levels by integrating the education that students in our service region receive with the training their teachers get on our campus through interinstitutional collaborations. [The university] does not currently have a garden of this sort, but it could. With 300 acres of land, it certainly could find the space for it.

If nothing else, this first proposal was both comprehensive and ambitious, just like the goals of food sovereignty often appear. It reflects the zeal that proponents of similar projects often have prior to undertaking the real work of daily project maintenance and promotion. While the intent of the project proposal was to provide a resource for the entire community, in practice students drove the project as they became the primary actors building the garden, growing food, and learning from it. Student interest initiated this project and has been a key strength from the outset.



Figure 4.—In this photo from October 2012, students are installing the garden's first deer fence. Today the garden has a larger footprint surrounded by a chain-link fence. Source: author

Campus Reaction

The proposal raised some controversy on the campus, but the student-centered nature of the project moderated some concerns. Reactions were of two types. There was plenty of healthy skepticism. Some colleagues seemed to view the project as a nostalgic throwback, such as the professor who discussed how he grew up in a community that maintained a collective Vermont farm in the 1970s. One dean in a different college suggested looking for donated land off campus, as it

would be easier to accomplish than a campus-based project primarily because of state contracting and work rules. But it was important that the garden be conveniently sited, located in a place that students frequented in the normal course of attending classes. In this way, all students enrolled in the class could access the garden.

The administration developed a long list of additional concerns (Table 1). Having a garden on campus raised questions for risk managers. For example, how were students to be trained in the proper use of shovels and drills? Receiving such concerns, I was struck to see the perception of larger issues that have never presented themselves over the past eight years. Issues of neighbor impacts never appeared except in this list. Costs for the project have generally remained exceedingly low, if not free. Pests have been negligible, except for snails, gophers, and rabbits. Nevertheless, the focus on students moderated these concerns.

Table 1.—The list of concerns

- The size, footprint, permanence, and structure of the garden
- The University's commitment to maintaining the garden
- All that is involved with community members coming on campus
- Whether what we are growing is edible, whether we're selling it, eating it, etc.
- Whether it is organic, non-organic, requires spraying, etc.
- Whether the location at [the childcare center] works for a larger garden
- Rodents and other pests that might have to be dealt with
- The impact to our nearby neighbors and [the childcare center] itself
- Regulatory approval requirements, e.g., city, Department of Agriculture, etc.

Source: Personal communication with author.

Skepticism and new concerns remain issues for the project to navigate, and the legitimacy of the project in the eyes of campus administration and staff has waxed and waned as staffing has changed. But there has also been generally a good deal of support, some stated but perhaps not acted upon. Potential partners initially included three deans, a research center, and the campus childcare center. Murakami (2016) provides an account of a similar effort to develop a learning garden on a land-grant university campus that suggests the administration was resistant to finding a location for the project. In this case, there were some difficulties because the campus master plan devotes significant space to future projects: What looks like open land is actually allocated to future uses, in many cases. However, the sustainability office worked to find a suitable location that would provide stability for the garden over the long term.

Financing the project was another issue. Apart from the initial grant funding, the garden has been supported through small amounts of professional development allocations and personal dollars, intermittent program and administrative support, and the efforts of students who buy plants, seeds, supplies, and tools, all of which have proven to be below the cost of books. Frequent dumpster diving in the campus yard—encouraged by campus staff for promoting reuse of materials—has been another essential strategy for acquiring low-cost materials for raised beds, benches, and other items. The campus facilities department provides a range of in-kind services, from irrigation to the occasional removal of garden waste. In the early years, a former manager also allowed for garden expansion so a new student garden club could have growing space. The sustainability office in subsequent years purchased a container for equipment storage and continues to help maintain the garden during breaks. Another college department that had a medicinal garden provided tools at the outset. These various partnerships, collaborations, and strategies are likely familiar to those involved in similar projects.

Part of the negotiation to start this garden was also that it remained exclusively student focused. In our requesting space, it became clear that “community” is a carefully maintained term on the campus because it implies certain kinds of connections that raised concerns on the part of administrators. These concerns played directly into the determination to call the experiment a “project” rather than a “community garden.” Sometimes campus members call it a *garden*, but never a *community garden*. The name also reflects the initiative's scope in that the effort has limited ability to feed the campus on a regular basis. Such a goal is unrealistic, given the thousands of students coming to the campus. In early iterations, about thirty students would take the class, but enrollment figures vary. Each student has a different level of interest in gardening, planting, farming, and food systems. The goal is to enable them to materially experience the garden, grow something, and, it is hoped, to contribute to their understanding of sustainability and food systems over the long term, regardless of their levels of knowledge, skill, and belief concerning these issues. Despite the many obstacles over the years, the student-centeredness of the project has been a rallying point for many campus actors.

The Current State of the Garden

For much of the past several years, the garden itself has been roughly five-thousand square feet in total. Students recognize they are concretely building, maintaining, and reconfiguring an alternative space on the campus, geared toward food production and their own learning about food

systems and sustainability. Every week, weather permitting, students take on various maintenance and development tasks and, depending on what is ready, harvest produce. At the same time, students read and discuss theoretical and popular texts about the food system in the garden. To avoid being overly proscriptive, assuming, or paternalistic—concerns raised by Pudup (2008) and Laycock, Pederson, and Robinson (2019)—I aim for students to lead the discussion as much as possible. We read and watch films about farm workers and processing workers. We consider corporate farmers and family farmers. We look at food activists and their connections to a variety of new and emerging products and markets.

Over the past several years, the assigned reading has ranged from *The Omnivore's Dilemma* (Pollan 2004) to *Stuffed and Starved* (Patel 2008), from *Global Foodscapes* (Fraser 2017) to *American Catch* (Greenberg 2014), and from *Hippie Food* (Kaufmann 2018) to *Farming While Black* (Penniman 2018). The variety of texts is meant to provide a current, accessible, and wide-ranging set of readings concerning the political economy and social relations of food systems and emerging trends with respect to organic, local food of all kinds, and to sustainable development in food. As for academic work, students maintain a journal of their experiences in the garden, complete a final paper focused on a commodity of interest, and conduct an individual food assessment in which they attempt to map the origins of the food in their pantries using ARCGIS Online. In this way, the class in the garden serves to augment student knowledge of the food system, provides a space in which to discuss their assumptions and understandings about food production, and introduces them to growing their own food.

Constant change over the past eight years has become a signature of the space. Myriad concerns and problems arise each semester. For example, the campus and the landscape crews sometimes turn off the water without notice. It is not uncommon that plants die through no fault of our own. The actual space of the garden remains subject to the negotiation between what is possible on the campus due to limitations imposed by administrators, the whims of the campus bureaucracy, and what students want to and can do, since they often work full time and take classes full time. I have found no better way of understanding and coping with this context than Pollan's (1991) reflection on his own gardens, which suggests there are always at least two gardens: the one you imagine and the one before you. The actually existing garden is invariably a work-in-progress. Or, as Gibson and Graham (2004) might describe it, the existing garden is a concrete manifestation of the politics of here and now. Gardeners in this project tend to figure things out through practice and collaboration. That means that the food project, in its initial years, could not have

definite goals in terms of its appearance. It looks the way one would expect a garden run by novice gardeners would look. It can be often under-planted or poorly planted early in the semester and overgrown or dead during breaks. Whatever potential setbacks emerge, we attempt to use them to come up with new opportunities for learning and to devise new strategies for growing food.

The project has a range of results, not the least of which is persisting over eight years. More important outcomes are that students experience what it takes to grow food and collectively learn from each other. Their time in the garden inspires many to start their own gardens outside of class and pursue volunteer opportunities and internships on organic farms. Some have gone on to pursue international opportunities through World Wide Opportunities on Organic Farms (WWOOF). It also provides a space for them to feel more connection with campus ecology. And the collective work of the garden creates more cohesion and community among students in the class.

While student evaluation data is by no means a comprehensive way of gauging outcomes, they help illustrate students' reactions to the hands-on activities in the course (Table 2). The responses concern what aspects of the class students felt were most effective in stimulating their learning. Students state that they come to like gardening and appreciate the model of simultaneously growing food and learning about food systems. In the first year, we find that students appreciate the activities in the garden, because, they state, they actually helped them to understand the food system. In the third year, we find students wanting to focus more on the garden itself while also enjoying learning about the food system. And in the fifth year, almost all student remarks concerning what stimulated their learning relate to working in the garden and even having "my own garden." These comments demonstrate how students become more fully participant in the class and take ownership of the garden space over the course of the semester. These data also suggest that students both desire and appear to benefit from working on the garden as part of the learning process rather than just a means of producing food.

Table 2.—Student Reactions to the Food Systems Course

List one or two specific aspects of this course that were particularly effective in stimulating your interest in the materials presented or in fostering your learning.

YEAR ONE	YEAR THREE	YEAR FIVE
“I enjoyed the books we read, listening to debates, and lecture, and garden developing.”	“I wish we planted more things in the garden.”	“The actual hands-on learning, being outside.”
“THE GARDEN! <u>Love it!</u> ”	“This was the most interesting class that I have ever taken! I wish this class could be my major. Loved it, made me think about my food.”	“Working in a garden; reading effective books.”
“The food project greatly increased my understanding of sustainability in the food system.”	“The garden.”	“Working on garden.”
“Creating the garden—planting and harvesting.”	“Gardening was immensely beneficial.”	“Got to plant our own crops.”
“Working outside in the garden.”	“Just learning about the food market system.”	“Learning how to prepare and maintain a personal garden.”
“Hands on learning activities and additional documentaries, garden activity.”	“Foods we consume in our bodies.”	“Physical gardening.”
“I like this course so far because it helps increase my awareness of the food we eat every day and how we deal with food to have a healthy lifestyle.”	“The difference between foods.”	“Getting to grow food was fun.”
“I enjoyed the hands-on aspect of the actual food project garden.”	“I would have liked to spend more time in the garden and participated with campus gardening projects.”	“I learned how to plant plants; I learned how to plant organically.”
“Hands-on work on the campus or class garden was highly stimulating.”		“Hands on learning.”
“Real gardening and real field trip: These aspects help me understand the food system much better.”		“Having my own garden.”

Emerging Directions of the Project

A few new directions are emerging in the garden. For the first several years, only a handful of students would eat the food they cultivated. When asked about it, they would not necessarily state that there was a single factor of concern. I suspect the food did not look like the food in the grocery store, while some students did not buy or prepare their own food. Some may have been suspicious of the land on which the food grew. There is also no refrigeration in which to store food, raising challenges in keeping food fresh while they attend other classes or work during the day. But my sense is that many more students are now taking food home, even in the absence of refrigeration. For example, in one recent semester, students basically ate everything that was left to eat from the prior semester. This included kale, carrots, potatoes, cilantro, and other herbs. There was nothing left after the first few weeks of the semester. That was a positive result and students discussed in class how they prepared the food at home.

Another trend is that course enrollments have been increasing. Initially, the class would barely meet the minimum required enrollments to be offered. But student interest has increased so that it is now easy to schedule a class of forty students every semester. It is also very hard to keep forty students busy in a garden. I often find that they are finished with whatever project they are working on and starting to discuss their weekend plans. At the same time, that is part of the course design: to force students outside into a different environment where they must talk with other students, make collective decisions, work and learn together, and build community. I want students to have time to hang out and talk about what is growing in the garden.

There are increasing requests from volunteers to work in the garden, conduct an internship, grow food, or just help out for brief periods of time. Sometimes, these requests come from deans seeking to connect staff to the garden. Librarians have helped with weeding on their lunch hours. The signature event of the year for volunteers is Cesar Chavez Day. On that day, the campus sustainability office organizes large numbers of students to spend the day in the garden, helping on various projects. This campus has a strong sense of giving back to the campus, and part of that giving concerns the garden project. Whether it is spreading wood chips, mending the fence, or weeding, there is always something to do, and the sustainability manager remains interested in expanding programming in the garden in support of food justice and sustainability.

We are in the process of expanding the garden as part of a larger grant to address food literacy. The project has been recognized for its potential

to produce even more food, and has been incorporated into the campus's student basic needs planning with the goal of supplying more produce to the student food pantry. After eight years, the project is set to address campus food security more directly by providing student-grown food to the student food pantry every week. Exactly how those connections will be fostered and maintained on a commuter campus is an open question and subject of research.



Figure 5.—Students working on the drip irrigation and other tasks in spring 2019. With increasing student interest, the environmental studies program is also able to offer regular courses. Source: Gabriel Valle

Other research relates to how participation in the effort to supply the student food pantry alters student understandings and leadership on the campus and how the seasonal cycle of food, the academic cycle of classes, and the weekly cycle of the food pantry can be coordinated together. There is some evidence suggesting students do take on leadership roles. For example, students have repeatedly sought to develop a garden club, expand the garden's growing space, and extend the project's impact. Garden club members have also worked with other clubs to reorganize and coordinate their members' efforts. The garden club has sold veggie burgers made with garden produce. They have sought out grants to support the garden and developed parallel projects such as a student-run

pollinator garden, which sits adjacent to the garden today. The clubs also help with garden maintenance. And during the pandemic, students helped to maintain the garden and supply food to the pantry for several months before the risks became too high. The aim is to further document and understand these outcomes and their connections to student participation in the garden.

Conclusion

Gardens as spaces are harbingers of larger goals and outcomes. They can teach about nature, individual connections to one's food, and food sovereignty, among other topics. In this paper, following the example of LaCharite (2016), I have sought to connect this project to ongoing trends in agricultural education with a focus on sustainability, critical thinking skills, and community. Literature on gardening points to many additional benefits to growing food beyond the food itself. At the same time, I have sought to extend this work by highlighting how student participation in creating and maintaining the garden have been important dimensions reinforcing student learning over the past eight years.

What initially started as a class-based garden on a commuter campus has evolved into a larger project with a range of community partners. Students report that they gain a lot through the combination of course readings, discussion, and hands-on learning. As the developer of the class, I have observed repeatedly the evolution of student understanding of food systems over the course of the semester. More classes are also teaching in the garden space, thereby reaching more students and, as a practical matter, enabling better garden planning, production, and deliveries. And campus partners have also taken ownership of the garden in ways that amplify the project's impact.

The initial applied aim of the project—food justice—remains an elusive goal at the university, which shares with many other campuses an alarming number of students who are food-insecure. In one recent report, researchers found that on average of forty-one percent of students are food-insecure (Crutchfield and Maguire 2019). The garden does not have the capacity to be the sole mechanism for addressing food security among students, but it can help. And while the project has benefited from repeated positive student reviews, recognition by the regional press, incorporation into campus sustainability and student basic needs planning, and a record of small but successful internal and external grants, it remains to be seen whether the campus will support the project over the long term. In the meantime, as Trauger (2017) suggests, by creating a space for growing food and a space where they can discuss issues related to the food system, this project appears to reinforce student

learning and provide students with closer connections to food and opportunities for additional campus activism. The title of Trauger's book is *We Want Land to Live*. Over the past eight years, gaining access to campus land has helped students learn.

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