Using Garden-Based Service-Learning to Work Toward Food Justice, Better Educate Students, and Strengthen Campus-Community Ties

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Abstract

In this article, we present several approaches for using garden-based service-learning to work toward food justice, better educate undergraduate students, and strengthen campus-community ties. We begin by introducing several key concepts related to food justice, community gardens as a strategy for strengthening food security and community development, and service-learning as a pedagogical tool for educating students about social justice, civic engagement, and personal responsibility for positive social change. We then discuss three of our service-learning projects in depth from an interdisciplinary perspective: the Fairmount Community Garden, the North Side Garden Survey, and the Como Community Garden. We evaluate the success of our approaches using multiple measures and identify the benefits our approaches have provided for undergraduates, community partners, communities served by the gardens, educators, and our university. We also discuss lessons we have learned, offer suggestions for best practices to follow in developing future garden-based service-learning projects, and compare and contrast our pedagogy with that of critical service-learning.

Introduction

Over the past four years, students and faculty from Texas Christian University have partnered with several local nonprofit organizations to work toward food justice, including strengthening community food security, through gardening initiatives. These initiatives include service-learning projects that students complete in collaboration with community partners in Fort Worth. We argue that garden-based service-learning projects like these offer an effective pedagogical strategy for emphasizing a hands-on, social justice-oriented approach to learning.

In this article, we discuss several approaches we have developed to use garden-based service-learning projects to work toward food justice, better educate undergraduate students, and strengthen campus-community ties. We begin by introducing several key concepts related to food justice. Next we show how community gardens can be an effective tool for enhancing food security and addressing other social justice issues, and review the literature on garden-based service-learning and critical service-learning. The bulk of the article focuses on three projects completed by our students involving the Fairmount Community Garden (Figure 1), the North Side Garden Survey, and the Como Community Garden in Fort Worth. We evaluate the success of these projects, and discuss the lessons we have learned from them in terms of best practices for garden-based service-learning. We then compare and contrast our pedagogy with that of critical service-learning. Finally, we look ahead to some future initiatives we and our community partners are planning.

From Food Insecurity to Community Food Security and Food Justice

According to the USDA, food security means "access by all people at all times to enough food for an active, healthy life"; by contrast, food insecurity refers to people who "were, at times, uncertain of having, or unable to acquire, enough food for all household members because they had insufficient money and other resources for food" (Coleman-Jensen et al., 2011, pp. 2, 4-5). The U.N. Food and Agriculture Organization (FAO) offers the following more detailed definition of food security, which was first adopted at the 1996 World Food Summit: "Food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (EC-FAO Food Security Programme, 2008, p.1).

Food insecurity is a growing concern throughout the United States. where 48.8 million people live in food insecure households (Coleman-Jensen et al., 2011). Texas ranks second nationally in food insecurity, with 18.8% of its population living in food insecure households (Coleman-Jensen et al., 2011). The prevalence of food insecurity in

our community of Fort Worth, Texas is 17.9% and affects approximately 143,000 individuals, with an estimated 44% of this population ineligible for federally funded nutrition assistance programs (Feeding America, 2011). As the USDA's definition of food insecurity above suggests, "the primary cause of food insecurity is poverty. . . . Since the need for food is related to biology, not economics, a person with a low income needs to spend a higher percentage of his or her income to meet basic food needs than does a middle- or high-income person" (Allen, 2004, p. 23; see also Poppendieck, 1998).

Both the federal government and grassroots groups have been working to address the increasing impact of food security nationwide. At the grassroots level, the community food security movement, which started in the 1990s, has focused on localizing food production to improve access to nutritious food for food insecure households and to build sustainable food systems. Hamm and Belllows (2003) define community food insecurity as "a situation in which all community residents obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes community self-reliance and social justice" (p. 40).

Community food security programs are meant to alleviate food insecurity over the long term by strengthening local capacity for food production, processing, and marketing (Allen, 2004, pp. 44-46). In other words, advocates work to build and strengthen local or community food systems. "Community food systems are collaborative efforts to build locally based food economies that emphasize social health, environmentally sustainable practices, and economic strength through their food production and processing practices. Community self-reliance is integral to the concept of local food systems because community residents are engaged in all phases of planning, evaluation and implementation" (Lutz et al., 2007, p. 3). Thomas Lyson (2004) calls these developing local food systems "civic agriculture," and Audrey Maretzki and Elizabeth Tuckermanty (2007) describe them as combining social and environmental movements related to local food with a political agenda. Programs have included support for a broad range of solutions involving local food systems, including farmers' markets, community kitchens, locally grown and processed foods, urban and community supported agriculture, and community gardening (Community Food Security Coalition, n.d.).

More recently, local food movement advocates have combined their insights with those of environmental justice advocates to develop a new concept called food justice. As Alison Hope Alkon and Julian Agyeman (2011) explain,

> The food justice movement combines an analysis of racial and economic injustice with practical support for environmentally sustainable alternatives that can provide economic empowerment and access to environmental benefits in marginalized communities. Its race- and class-conscious analysis expands that of the food movement to include not only ecological sustainability but also social justice (p. 6).

Robert Gottlieb and Anupama Joshi (2010) spell out their specific vision for food justice as "ensuring that the benefits and risks of where, what, and how food is grown and produced, transported and distributed, and accessed and eaten are shared fairly" (p. 6).

At TCU, we have developed our garden-based service-learning pedagogy as a response to food insecurity, and have used the visions of community food security and food justice advocates as goals we and our students will work toward with our community partners.

Community Gardens as Part of the Solution to Urban Food Insecurity and Other Social Justice Issues

Community gardening is, of course, only one method that local communities can use to work toward community food security and food justice. People can also grow food for themselves in their own individual gardens, assuming they have the needed gardening know-how, time, and access to sufficient fertile land (e.g., if they own or rent a house with its own backyard). What sets community gardening apart from such individual gardens is encapsulated in the word "community." Mark Winne (2008), former executive director of the Hartford Food System, defines community gardening as gardening "in community with others…to achieve something that benefits all" (p. 51). And in answer to the question, What is a community garden?, the American Community Gardening Association responds: "Very simply, it is: any piece of land gardened by a group of people" (http://www.communitygarden.org/learn/).

At least since Hazen Pingree's Potato Patch movement began in Detroit in the mid-1890s, community gardens have been seen as an important

solution for increasing access to fresh, nutritious produce among urban populations in the United States (Gottlieb & Joshi, 2010; Lawson, 2005; Pinderhughes, 2003). More recently, community gardening has been identified as one of several viable strategies for improving food security for families with limited income. Community gardens are good ways to address food insecurity because they provide easy access to low-cost produce for gardeners and their families (see, e.g., Wakefield et al., 2007); they can be highly productive (Pinderhughes, 2003); and they have a proven track record of improving nutrition among the gardeners and their families (Draper & Freedman, 2010; also Alaimo et al., 2008).

Moreover, community gardening can also help communities work toward social justice in other ways (Lawson, 2005). By working together on a garden, community members can build social capital that they can later spend on other efforts to strengthen their communities (Draper & Freedman, 2010). Perhaps even more importantly, community gardens can help lay the groundwork for future community organizing efforts by connecting people to each other across race, class, age, etc.; by fostering a sense of responsibility for the community's welfare; and by building community leadership and offering a central safe space in which community organizing can happen (Draper & Freedman, 2010; Kirby, 2008; Levkoe, 2006; Pinderhughes, 2003; and Woelfle-Erskine, 2003).

To help bring some of these documented benefits of community gardens to our local communities, and in response to requests from partner agencies, the Fort Worth-based Tarrant Area Food Bank (TAFB) began a new Community Garden Program in spring 2010. The program has also received significant financial support from the Tarrant County Public Health Department. To assist people most in need, the program focuses on communities that have been identified as being especially food insecure (i.e., "food deserts"). Katey Rudd serves as Community Garden Coordinator for TAFB, with the assistance of a volunteer Community Garden Board. TAFB provides leadership and community-building trainings for garden leaders; classes and workshops on gardening, cooking, nutrition, and related topics for all interested gardeners; a Community Gardening Resource Guide; materials to construct raised bed gardens; seasonal seed and/or starter plant kits; and ongoing technical support for addressing gardening challenges or other issues as they arise.

To participate, each potential garden site must be sponsored by a community-based organization, locate and secure land, conduct a community strengths and needs assessment and garden interest survey, find at least 15 volunteers who agree to help care for the garden, and identify three to five garden leaders (among other items specified in a Community Garden Partnership Agreement with TAFB). Those garden leaders serve as the main community contacts between TAFB and the gardens, and are also invited to serve on the TAFB Community Garden Board. Other board members include representatives from interested nonprofit organizations such as the Tarrant County Master Gardener Association and JPS Health Network, a Tarrant County public health network that includes John Peter Smith Hospital, whose mission is to ensure health care access for all citizens (see http://www.jpshealthnet.org), governmental agencies and academics (mainly the authors of this article).

By July 2012, 14 gardens had been established through the TAFB's Community Garden Program. Community-based organizations that have sponsored gardens have included a number of local churches with food pantries, the YWCA in downtown Fort Worth, and several housing complexes with large refugee populations.

Service-Learning Using Community Gardens

Despite the long-term popularity of community gardens as a solution to community food insecurity and the proven success of service-learning as a pedagogical tool, few articles have been published on projects that combine these two approaches at the college or university level. Based on an extensive literature review, we have found that such pedagogical approaches fall into the following general categories: food/agriculture/nutrition, community or developmental psychology, environmental science, and K-12 education. Some instructors use service-learning in community gardens to teach ecological literacy related to food and hunger, agricultural economics, and horticulture, among other topics (Adelman & Sandiford, 2007; Agricultural Economics and Agribusiness, 2009; Chika et al., 2011; Dart, 2010; Jones & Popp, 2009). Others have employed service-learning in community gardens as a means to teach about community or developmental psychology (Langhout et al., 2002; Northwest Indian College, n.d.). Community gardens are also being used to teach college students about various aspects of environmental science (Agape Center for Service and Learning, 2010; Guenther, 2011). Finally, school gardens can also help students learn how to

design effective science curricula and other aspects of K–12 education (Eckerd College, n.d.; Portland State Educational Leadership and Policy Program, n.d.).

Garden-Based Pedagogy and Critical Service-Learning for Food Justice

Although we found few examples of college-level curricula that use community gardens and service-learning to teach about and work toward social justice, specifically food justice, an extensive literature has developed since the 1990s that critiques the shortcomings of college-based service-learning programs in relation to social justice while offering creative revisions of such programs to address these issues (e.g., Brown, 2001; Butin, 2007; Marullo & Edwards, 2000; Rosenberger, 2000). This section reviews some of the key findings of this literature, focusing especially on recent work in critical service-learning by Tania Mitchell (2008a and 2008b) and Susan Benigni Cipolle (2010). We will then introduce our own garden-based pedagogy.

In a seminal article, Mitchell explains the differences between "traditional" and "critical" service-learning (2008b). Both kinds of service-learning seek to improve education by giving students hands-on exposure to work in local communities and can provide transformative educational experiences. However, according to Mitchell, Kinefuchi (2010), and others, traditional service-learning may not only produce no meaningful social change, but also may actually reinforce existing hierarchies and stereotypes because it often works from a charity mindset and does not help students think critically about the root causes of social problems and act to address those root causes (rather than just symptoms such as hunger; see Poppendieck, 1998). By contrast, "critical service-learning programs encourage students to see themselves as agents of social change, and use the experience of service to address and respond to injustice in communities… . The work to realize the potential of this pedagogy and avoid paternalism demands a social change orientation, working to redistribute power, and developing authentic relationships as central to the classroom and community experience" (Mitchell, 2008b, pp. 51–52).

Mitchell's and others' suggestions on best practices for critical service-learning pedagogy all begin with helping students develop critical consciousness/awareness of social justice issues, especially the root causes of systemic injustices.

Cipolle (2010) offers an especially helpful model for helping students–specfically white, privileged students–develop critical consciousness (for other such models, see Mobley, 2011; Rhoads, 1997; Rice and Pollack, 2000; Rosenberger, 2000). Cipolle identifies four essential elements of critical consciousness development in general: self awareness, awareness of others, awareness of social issues, and ethic of service/change agent. Among white, privileged students, Cipolle describes three stages of critical consciousness development through which students pass during their lives: an initial or charity stage, when they want to help others, but out of a charity motive rather than a critical analysis of underlying issues; an emerging or caring stage, in which students start to see injustice, question past beliefs, and become compassionate based on their critical thinking; and finally a developing or social justice stage, in which students commit themselves to work as allies with oppressed groups to address the root causes of social injustice and make the system fairer for all.

Our garden-based pedagogy has been inspired by and aspires to many of the tenets of critical service-learning that were just described. However, we have also included alternative approaches that better reflect our pedagogical and practical goals, the kinds of students who take our classes and their level of preparation, and address potential problems with instructor-initiated social change activism in the classroom. We will discuss how our pedagogy both reflects and differs from critical service-learning after we have presented it.

As with critical service-learning, our garden-based service-learning pedagogy begins with the premise that the projects our students undertake must balance the need to achieve practical goals set by our community partners with achieving student learning outcomes that foster awareness and understanding of food security concerns, as well as help students learn the skills they need to help effect change (Brown, 2001; Mitchell, 2008b). Specifically, service-learning experiences in our classes focus on achieving the dual goals of both working toward food justice in Fort Worth and helping students better learn about food insecurity and related topics, social and economic diversity, and the benefits of sustainable local food systems. Learning outcomes also focus on building students' professional skills by applying classroom knowledge to help real people in their local communities, developing good citizenship and community-building skills, and strengthening campus-community ties. In the next section, we provide a brief overview of

three such projects we have conducted through the departments of Sociology and Anthropology and Nutritional Sciences at TCU, in partnership with members of the Tarrant Area Food Bank's Community Garden Program.

Three Garden-Based Service-Learning Projects in Fort Worth

Fairmount Community Garden

Each spring since 2008, Aftandilian has taught an anthropology course entitled "Environmental Justice, Human Rights, and Agriculture." For their final service-learning projects in the class, students work in small groups with community partner organizations to help improve some aspect of food justice in Fort Worth. In spring 2010, two groups of students worked to help install and publicize the Fairmount Community Garden. Fairmount is a mixed income community, and is also ethnically diverse, with large numbers of white and Latino/a residents, as well as some African American residents. Susan Harper, a certified master gardener and community resident, was selected by the Fairmount Neighborhood Association to be the Garden Manager, and worked with Aftandilian's students; she is also a member of the TAFB Community Garden Program Advisory Board. Student groups helped prepare the site and install the garden beds, and also promoted the garden to community members by developing an informational flyer in both Spanish and English and distributing it door to door in the community.

North Side Garden Survey

To demonstrate different models of garden plot construction, composting, water collection, etc. for participants in their Community Garden Program, TAFB had planned to install a Learning Garden in the North Side community of Fort Worth. They had been given a long-term lease for a potential garden site in that neighborhood by the family of an employee. However, TAFB did not know whether local residents actually wanted a garden in their community, and if they did, what sort of garden they would prefer. Therefore, in spring 2011, another group of students from Aftandilian's class worked with the TAFB Community Garden Coordinator to develop a survey and administer it on the North Side to answer these questions. Through their survey, the students learned that an overwhelming majority of the neighborhood (about 90%) was eager to have a garden available to them. However, two-thirds of those surveyed preferred to

have a community garden in which they could grow fresh produce for themselves, rather than merely a learning garden that demonstrated gardening techniques. The students presented this finding to a meeting of the TAFB Community Garden Program subcommittee that was working on designing the North Side Learning Garden. In part because of the students' survey research with the community, TAFB chose not to set up a learning garden on the North Side.

Como Community Garden

In fall 2010, the present authors collaborated with TAFB's Community Garden Program and the Tarrant County Master Gardener Association on a service-learning community garden initiative to help meet the increasing need for expanding food assistance and nutrition education programs among community-based organizations in the Como neighborhood, including the Como Community Center. Under the direction of the TAFB Community Garden Coordinator and master gardeners, Dart's dietetics students developed, team-taught, and evaluated a six-week after-school gardening and nutrition education program for elementary-age children (see also Dart, 2010). Program components for TCU students included (1) completing a five-week basic gardening training program taught by master gardeners; (2) completing a five-week training session led by the TAFB Community Garden Project coordinator that provided historical and current background information about the Como community and its residents, food security and insecurity, community food systems and food growing techniques, gardening as a tool for community and leadership development, and nutrition and garden-based education and teaching skills; (3) developing and teaching a garden-based curriculum linking food, nutrition, and plants from the garden at the elementary school level; (4) providing Eating Healthy Snack activities to enhance lesson content; and (5) engaging children in service-learning activities at the Como Community Garden to increase skills and knowledge about gardening and enhance their understanding of the importance of agriculture in building sustainable communities. Students completed this program in 2011 and 2012 as well.

Methods for Evaluating Success of Garden-Based Service-Learning

We use a variety of approaches to evaluate the effectiveness of garden-based service-learning

projects. Aftandilian's students have completed pre- and post-service self-evaluations since spring 2011 (North Side garden group only), and final post-service reflection papers since spring 2008 (both Fairmount and North Side groups). Each semester, Dart's dietetics students complete an extensive online summative evaluation about their gardening experiences and outreach education based on Fink's Taxonomy of Significant Learning (Fink, 2003). For the Como project, students also completed a pre- and post-program evaluation that assessed how much they knew about food security and insecurity; food growing systems and gardening skills; culture, community, and gardening; and nutrition- and garden-related education and teaching skills. In addition, community partners are asked to evaluate student learning and service performance each semester, and to assess whether and how these garden projects have helped their organizations achieve their goals.

Benefits of Garden-Based Service-Learning

Using these evaluation methods, as well as our own personal observations, we have documented benefits of garden-based service-learning for students, community partners, communities served by the gardens, educators, and our institution (TCU). In this section we will discuss benefits produced for each of these groups through the garden projects described above. We have organized this discussion around our three primary objectives for these projects: working toward food justice, helping students learn better, and strengthening campus-community ties.

Working Toward Food Justice

From the community point of view, one of the most important benefits of having new community gardens is easier access to low-cost, healthy, nutritious produce. For example, the Fairmount Community Garden Project has provided plots in which 76 families can raise vegetables, thereby strengthening community food security, improving nutrition, and helping balance family food budgets. Susan Harper, the Fairmount Garden Manager, said that "I'm not sure the garden would have ever been finished had it not been for all the TCU students…. [Y]our students contributed endless enthusiasm and a lot of hard physical work."

From August 2011 to July 2012, the Como Community Garden donated 1,286 pounds of produce to local food pantries such as the Como Senior Community Center, to which it delivers fresh vegetables every week during the growing season. This figure does not include produce that volunteers from Como are encouraged to bring home to their own families. Local residents who volunteer in the garden also receive free training in how to grow their own produce from the Como Garden coordinator, Clarice Abuto. According to Ms. Abuto, "through the different gardening activities, volunteers learn how the different crops relate to each other, how to nurture the soil through crop rotation, and different methods of preventing soil erosion by wind and water runoff." Ms. Abuto further notes that "the Como Community Garden has been vital in bringing residents together and providing a safe forum to address development issues."

Our students have also observed that community gardens strengthen communities by providing a safe space where neighbors can get to know each other, building connections that can later be drawn upon to address other issues of concern to the community (i.e., gardens help build social capital). As one of the students who worked on the Fairmount project put it in their reflection paper, "while working in the garden I was able to witness and actually be a part of a community coming together. I watched firsthand as distanced neighbors became friends and shared ideas on their knowledge of the best way to grow a tomato."

Finally, gardening also nurtures self-esteem and leadership skills among both community members and students. Carol Brown, director of the Como Community Center, said that "I think the class accomplished my goals: to see the [Como] kids learn leadership, how to work together, and live a healthier life." TAFB Community Garden Coordinator Katey Rudd said that "the TCU students learned to teach in a garden environment, write lesson plans, manage children, create learner-centered and interactive classroom time, teach seed-to-table concepts and actually create a garden, and evaluate children for true learning. This was a tall order, but I was impressed by how they grew as educators and learners over the semester."

Helping Students Learn Better

For our students, us as educators, and TCU, one of the most important benefits of garden-based service-learning projects is that they help our students learn better. Specifically, these garden projects provide students with firsthand knowledge about food justice and food insecurity, social and economic diversity and injustice, the benefits of sustainable food systems, and how to build them. Students also gain a sense of personal

and professional achievement and develop good citizenship and community-building skills.

Many of our students are limited in their knowledge and awareness of food security and insecurity before they enter our classes. For example, before they began working on the Como garden project, two-thirds of dietetics students felt that they knew little or nothing about food security and insecurity. But by the end of the project, all of the students involved in it had developed greater awareness and a "good-to-excellent" understanding of the varying characteristics of food insecure households, contributing factors and populations at high risk, and the health consequences of poor nutrition and inadequate dietary practices. Additionally, 83% of students reported that following their experiences they were "able to fully understand and discuss issues related to poverty, food insecurity, and public health concerns."

Similarly, few of our students have much firsthand knowledge about social and economic diversity in relation to food insecurity at the beginning of class. As one student in the North Side Garden Survey group explained in their reflection paper, "Being raised in a fortunate family can create a type of ignorance towards the world that you live in. You become sheltered from learning about those who are not as fortunate. Me, being a fortunate person who participated in this project, made me realize that I have been unaware of other people's struggles for something so simple like fresh vegetables."

Through their hands-on garden projects, students also gain a sense of achievement and personal empowerment to address issues of food injustice such as food insecurity. For example, students in the North Side group had much higher average scores after than before their project in response to the self-evaluation question, "How confident do you feel in your ability to help solve some of the problems with global and local food injustice that we have been discussing in this class?" Group averages for Likert-scale responses to this question were 3.50/5.00 pre-service compared with 4.25/5.00 after. As one of the students in the Fairmount group put it, "By passing out fliers and working side by side with the members of the Fairmount community, I got the satisfying feeling that I was actually making a difference in the community and making a direct impact on people's lives. The outcome of our project was more than I had ever imagined. . . ."

Working on garden-based service-learning projects also helps students develop good citizenship and community-building skills. These learning outcomes are especially important at TCU, since our mission statement is "to educate individuals to think and act as ethical leaders and responsible citizens in the global community." Dietetics students reported that their gardening service experiences allowed them to collaborate and build cooperative relationships for collective decision making, as well as for identifying and promoting common interests in the community. And several students were inspired to transplant their work in the Fairmount garden to other communities. An international student wrote that this project "opened my mind and showed me different ways of helping people. … I am going back to Panama and I want to make urban agriculture a way to help Panamanian communities."

Strengthening Campus-Community Ties

Finally, our garden-based service-learning projects have also helped strengthen ties between our students and local Fort Worth communities, as well as between us and our community partners. For example, students in the North Side Garden Survey group felt much more connected to the community after completing their project. Their scores in response to the self-evaluation question, "How connected do you feel to the off-campus community in Fort Worth?" rose from an average of 2.50/5.00 before the project to 3.75/5.00 afterwards. The North Side students also noted this change in their reflection papers; one wrote that "One thing I really took with me from this community survey project was getting a feel for how other people live, even other people in the same city as me." Students in the Fairmount group echoed this sentiment; as one student put it, the project gave them the chance "to get out and make real connections with people."

These strengthened campus-community ties bring a number of benefits. First, students have a chance to step outside what several of them have described as "the TCU bubble" and share the experiences of people living in other Fort Worth communities. This is especially valuable for TCU students, most of whom come from economically privileged and ethnically homogenous (white) backgrounds. For us, working with community partners over a period of years gives us the chance to deepen our own community connections. For example, our work in garden-based service-learning led us to participate in TAFB's Community Garden Project, which has helped link us to a much wider network of community partner organizations.

For our community partners, including Feed by Grace, TAFB, and the Tarrant County Master Gardener Association, working with us has lent academic legitimacy to their efforts, which they have been able to leverage into several successful grant applications. Finally, TCU benefits as well, both because garden-based service-learning projects help our students achieve the TCU mission described above, and because having students and faculty actively and equally partnering with local organizations, as we do, improves TCU's image in the community.

Challenges and Best Practices for Garden-Based Service-Learning

Of course, we have also encountered a number of challenges in our garden-based service-learning projects, which fall under the general categories of communication, curriculum and student learning, and pragmatic issues. Because these challenges were similar across all of our projects, we will discuss them together in this section and explain how we have modified our approaches in response to each set of challenges, thereby developing a set of experientially grounded best practices for garden-based service-learning.

Communication

The two communication challenges we have encountered most often are the difficulty of coordinating interactions between community partners, students, and/or faculty, and a misunderstanding of the scope and goals of the service-learning partnership between the community partners and students or educators. For example, students in the Fairmount Garden group often found it difficult to coordinate work days with the garden manager's schedule. And in past projects (not discussed here), both of us have also had students who misunderstood the needs of their community partners, and therefore took their projects in an inappropriate direction. To address communication challenges like these, both practical and pedagogical solutions can be effective. On a practical level, we have found that communications can be streamlined by asking one student in each project group to serve as the "communicator" responsible for channeling all contacts among students, community partners, and faculty. We have also learned that it is important to keep in touch with our community partners on a regular basis not just throughout the course of the project or semester, but throughout the year (Mitchell, 2008b, pp. 60-61). For example, we have

avoided many potential communication problems by arranging potential projects with partners the semester before a course is taught, and clearly setting out responsibilities for faculty, students, and community partners. Instructors should also follow up with community partners to seek their feedback after a project has been completed. Seeking and incorporating such feedback helps develop and maintain long-term partnerships.

On the pedagogical level, faculty and community partners should work together to create true community-university partnerships in which community issues and concerns about food justice are as important--in terms of planning, implementation, and evaluation—as student learning and development (Brown, 2001; Mitchell, 2008b; Rosenberger, 2000). We also seek our partners' input in all aspects of garden service experiences, including developing curricula and assignments, teaching students and supervising service experiences, and establishing learning outcomes and evaluation criteria (cf. Brown, 2001; Marullo & Edwards, 2000; Mitchell, 2008b; Rice & Pollack, 2000). For example, in the Como project, master gardeners and the TAFB Community Garden Coordinator were invited to co-author student assignment sheets and methods for evaluating student performance, and also participated actively in developing curricula, educating students, and evaluating their work.

Curriculum and Student Learning

We have also encountered challenges regarding both our curricula and student learning. In terms of student learning, it can be difficult to encourage students to take responsibility for their own learning, i.e., to be self-directed learners, which is crucial for service-learning to succeed (Rhoads, 1997; Mitchell, 2008b). We have used various methods to achieve this aim. Periodic self-evaluations by the students can help identify potential problems in this regard while there is still time to resolve them. Accountability checks can also be built into graded assignments. For example, Aftandilian requires students to submit a group progress report midway through the time allotted for their projects. These progress reports are graded, and provide an often-needed wake-up call to the students.

Some of Dart's dietetics students have also had difficulty seeing the connection between garden-based service-learning and course learning outcomes related to typical applications in dietetic practice. Teaching strategies that have proven successful in addressing these challenges have included revising

the garden training for students to focus more on linking the importance of the food cycle and foods grown in the garden with food-to-table nutrition concepts that they could apply in their teaching. Likewise, helping students better understand the benefits of gardening for food insecure families was critical in building skills for effective teaching. Initial training sessions in the classroom addressing issues with community food security were essential for student learning and helped in bridging the gap in their garden-based service-learning experiences.

Dietetics students also complained about too much time being devoted to the lecture portion of gardening training sessions and not enough time for hands-on instruction in the garden. In response to these critiques, Dart and the master gardeners have revised the gardening curriculum to be less technically detailed and more focused on teaching just the basics of fruit and vegetable gardening that are most applicable for a community gardener. As much of this curriculum as possible is conveyed through hands-on activities.

Finally, to help students achieve some of the learning outcomes described above, we have also given them opportunities to reflect upon and evaluate their service experiences (see also Jacoby, 1996; Mitchell, 2008a and 2008b; Rice & Pollack, 2000; Rosenberger, 2000). Working with food insecure communities has challenged our students to move beyond familiar "comfort zones," and reflection is essential for this type of transformative learning. When they reflect about service experiences that introduced them to social issues and concerns, our students learn to question their assumptions and values, and in turn gain a new understanding and perspective about their work. Likewise, by engaging students in formative and summative evaluation, we can help them develop skills that are crucial for assessing social systems and issues, as well as the impact of their service-learning. Student evaluations also elicit valuable feedback about service outcomes, provide a forum that encourages personal responsibility in conveying information, and empower students to express their ideas and offer solutions for change.

Pragmatic Issues

Finally, pragmatic concerns often arise. One of the most common is that the limited timespan available for garden-based service-learning projects in the context of one class can make it difficult to achieve the goals that we, our community partners, and/or our students have set for our projects. Many of our students share this frustration; the most frequently expressed student complaint is that they wished they had more time to work on their projects. While we cannot address this issue directly for students in the context of a single course (there are only so many weeks in a semester), we are working to provide longer-term opportunities for students to continue their work with community organizations through potential semester- or summer-long internships and a minor in Community Engagement (see **Conclusion**).

From faculty and community perspectives, we have found the best solution to this issue is to nurture long-term partnerships and university engagement with the same community partners in gardening initiatives over a period of several years, rather than just for a one-time service project. Our commitment to building long-term relationships has also allowed our community partners to expand their service work, providing our students with more and greater skill-building opportunities that not only enhance their personal and professional development but also work toward food justice (Marullo & Edwards, 2000; Mitchell, 2008b). Cultivating service-learning partnerships over time can also help campuses and community to do more to ensure a continuum for community-building. For example, by partnering with Fort Worth community members with similar interests, we have drawn increased attention to food security issues and have been able to collaborate on funding opportunities for possible community-wide food policies and future garden sites in "food desert" neighborhoods, such as TAFB's Community Garden Project.

Garden-Based Service-Learning Pedagogy and Critical Service-Learning

Earlier in this article we reviewed the literature on critical service-learning, and noted that our pedagogy had been inspired by and aspires to these approaches. Now that we have presented key aspects of our pedagogy, we would like to reflect on how our approach is both similar to and different from those recommended by scholars of critical service-learning. We hope our reflections will prove helpful to other instructors who draw on critical service-learning and related community engagement theories. We will organize our discussion into the three themes that Tania Mitchell has argued should characterize critical approaches to service-learning: social change orientation, working to redistribute power, and developing authentic relationships (Mitchell, 2008b).

Social Change Orientation

In critical service-learning, instructors should help students learn about the root causes of social injustice and their impacts on communities; connect their service to broader issues like these; reflect on their own position of relative power and privilege; and advocate for positive social change (Mitchell, 2008b). Mitchell, Cipolle (2010), and other scholars have explained that to adopt this orientation, both students and instructors need to develop a critical consciousness regarding social justice.

We assign readings in our classes that help students learn about social injustice, both its sources and its impacts on communities. For example, Aftandilian frames his course using the concepts of environmental justice and environmental racism. "Environmental racism" refers to the disproportionate impacts of environmental hazards such as the location of toxic waste dumps on communities of color, while "environmental justice" describes what people in those communities are fighting for (Pellow, 2002, p. 8). Students read about and then apply in class and in a paper three environmental justice analytical frameworks developed by Robert Bullard (2005), David Naguib Pellow (2002), and the National People of Color Environmental Leadership Summit (1991). We then refer back to these frameworks throughout the class and use them to analyze cases of social injustice related to food. Perhaps the most important insight of all these frameworks is their focus on the central question, Who benefits from each case of environmental injustice, and who pays the costs? Other instructors who focus on environmental aspects of social injustice might benefit from adopting this framing as well, which to our knowledge has seldom, if ever, been discussed in the literature on critical service-learning.

Community members are also invited into our classrooms, so that they can share their social justice challenges with the students in their own words. For example, in spring 2012, Aftandilian invited local community development advocate Shirley Lewis to discuss the environmental and social justice challenges her South Side community has faced and the solutions they have developed.

We also try to bring students into the communities they will be working in before their service-learning projects begin so that they can see community resources and challenges for themselves. Katey Rudd guides dietetics students on a windshield survey of the Como neighborhood where they will be teaching children about healthy eating and gardening, and provides them with additional historical and contemporary information about the community.

Although we do not ask students to reflect directly on their own position of power and privilege relative to the people they will be working with on their service-learning projects (reflection to encourage self-awareness, a key component of critical consciousness development according to Cipolle, 2010), we do provide open-ended reflection opportunities which some students use for this purpose. For example, in response to a comprehensive survey that Dart administers after her students' work in Como, one student said that "I have heard a lot about cultural eating habits, but this was the first real experience that I had with it. Como is mainly lower income minorities. After spending time with the children, I had a better understanding of why nutrition is not as prevalent in their culture." Another wrote that "The Como Community Garden project experience definitely changed my view on behavioral traits typical of people who live in low-income areas like Como." We recognize the value of providing more formal opportunities for students to engage in self-awareness oriented reflections like this, and are considering adding such a writing assignment in future classes.

Unlike some critical service-learning models, we do not expect students participating in our garden-based service-learning projects to engage in advocacy for social change. We have chosen not to do so for several reasons, primarily related to our students' socioeconomic background and level of critical consciousness when they arrive in our classes. Most of the students in our classes are white and from wealthy backgrounds. Many have never interacted directly with people of color before, and if they have, it has primarily been in charity settings. Most have never taken a social justice oriented course before, nor any that include service-learning.

In Cipolle's terminology, our students are very much at the beginning or "charity" stage of critical consciousness development. We feel it is our job as responsible instructors to meet these students where they are, and help them to move toward the next "caring" stage of critical consciousness, not force social change advocacy down their throats. Indeed, doing so may turn students off from working toward positive social change, since they may dismiss what they perceive as overly activist perspectives as "biased" (Seider, 2009). Instead, we agree with Tania Mitchell, who

wrote that it is better to "support students where they are and affirm the commitments they are able and willing to make" (Mitchell, 2008a, p. 10). As Mitchell learned from observing students in the Citizen Scholars Program at the University of Massachusetts Amherst, "while some students felt prepared to engage in revolutionary action that challenged current structures and systems in an effort to transform society, others believed that continued involvement in service and acting with their votes to bring candidates holding similar values into office, were the appropriate next steps to acting on their commitments. It is important for instructors to recognize the validity of both positions" (Mitchell, 2008a, p. 10).

As Cipolle (2010) has pointed out, it takes time for students to develop their critical consciousness; this is a process that takes years, not months. "Realistically, given students' maturity levels and varied experiences, only some reach the developing stage [social justice stage] by early adulthood. However, if students are equipped with critical-thinking skills, multiple service experiences, and a better understanding of themselves and the world, seeds are planted for continued growth toward critical consciousness" (pp. 14–15).

We have found Cipolle's observations to hold true based on our own experiences with students. Although we do not expect students to advocate for social change while they are in our classes, we do hope that our pedagogy will plant the seeds for such advocacy in students' minds and hearts. And we have some evidence to support that hope. Katey Rudd, who coordinates TAFB's Community Garden Program, took both of our garden-based service-learning classes as a student and discovered a passion for food justice work through her experiences. Other alums have carried out community-based participatory research on food insecurity for their master's degree, worked with small farmers in Central America and the Caribbean on sustainable development projects, sought careers with nonprofit organizations that serve low income residents of Fort Worth, and chosen to purchase produce for their food truck business from local community gardens run by refugees and homeless people.

Working to Redistribute Power

In addition to adopting a social change orientation, Tania Mitchell said that students and instructors engaged in critical service-learning should work to redistribute power to community members. Our garden-based pedagogy

accomplishes this in several ways. First, as explained above, we work directly with our community partners to develop each of the service-learning projects. We also invite our community partners to give guest lectures in class, help create and revise our curriculum, teach the students in the field, and evaluate the students' work. In addition, we remind our students throughout the semester that our community partners have the final say on how the projects will be carried out, not us or the students.

We also work to redistribute power by making sure that we and our students view our service as working *with* rather than *for* community members, empowering community residents to work on their own behalf (Saltmarsh et al., 2009, p. 10; Wade, 1997, p. 64; Wade, 2000, p. 97). Rather than just applying a band-aid solution to issues of food insecurity, teaching people to garden and helping them establish community gardens of their own help address some of the structural issues with lack of access to fresh, nutritious food that many communities face.

Finally, we also help level the playing field in terms of power dynamics between our students and community members by having both groups learn the same skills almost simultaneously (Mitchell, 2008b, 58). Before learning basic gardening techniques from the master gardeners, Dart's dietetics students know next to nothing about how to grow vegetables. This means that when the students develop lesson plans later in the semester to teach elementary schoolchildren in Como how to garden, they are less likely to operate from a mindset of superiority, since they only just learned these skills themselves.

Developing Authentic Relationships

Mitchell identifies developing authentic relationships, relationships based on connection, as the last key aspect of critical service-learning. We strive to develop such relationships both between ourselves as instructors and the community organizations we work with, and between our students and community members. On the faculty/community side, we pursue long-term relationships with our community partners, working with the same partners over a period of years, not just a semester, so that we are better able to help them achieve their long-term goals and so that we have time to fix problems that may arise with one particular project to improve future ones (Mitchell, 2008b, pp. 60-61). And as described above, we strive to develop good communication with our community partners before, during, and after the

semester, in which both partners feel comfortable voicing their opinions (Mitchell, 2008b, p. 60).

On the student/community side, we begin by making sure the students have a good understanding both of the communities they will be working in and of the missions of their community partner organizations. We also help students learn to communicate in an age- and culturally appropriate manner with community members. As one student put it, "working with the children at Como taught me a new communication style based on a very different culture than my own." And another said that "I have been able to understand the communication between children and adults in a learning environment as well as those who are living in poverty."

Mitchell also urges instructors to help students establish authentic relationships by first reflecting on their own biases, and then being aware of both similarities and differences between themselves and community members as they do their service work (Mitchell 2008b, p. 59). While we do not formally require students to engage in such reflection, many choose to do so in their blog posts, post-service surveys, or final reflective papers. For example, one student wrote that "the gardening experiences really just exposed me to a part of the population that I haven't had much interaction with. I grew up in white upper-middle-class suburbia and had very little interaction with low-income populations until I graduated from high school." And one student who worked in the Fairmount Garden shared with the class that in his own neighborhood, nobody worked together on community projects, yet through this project he saw with his own eyes how another community was able to do just that and come together to create a garden.

Future Directions for Garden-Based Service-Learning in Fort Worth

Garden based service-learning offers educators the opportunity to implement many aspects of critical service-learning pedagogy and emphasize a social justice approach to learning, while also working toward food justice for local communities. It helps better educate students, fostering their awareness of food insecurity and related issues, and giving them direct experience with the effects of social inequities on individuals and communities. And it empowers students to work to address these inequities, engaging them in problem-solving strategies and community change oriented service in partnership with members of those communities. Finally, garden-based service-learning also helps strengthen campus-community ties.

As we emphasized earlier, effective garden-based service-learning pedagogies need to take the long view. For example, we are currently planning several future projects with our community partners. First, students will help evaluate the success of TAFB's Community Garden Project, including the Como garden. Specifically, students will conduct on-site evaluations of each of the gardens that have been built as part of this initiative, looking for evidence of whether the gardens are being well maintained (e.g., presence of unplanted or weedy plots), whether gardeners are taking ownership of the gardens (e.g., by personalizing them with garden art), etc. The students will also conduct in-person interviews with gardeners to ask them their opinions of the gardens and their contributions to the community. Second, students will work with TAFB's Community Garden Project and other community partners to establish new or expand existing gardens.

Also, as part of our institution's upcoming reaccreditation, we helped lead an interdisciplinary team that proposed TCU implement a Quality Enhancement Plan (QEP) on Community Engaged Learning and Scholarship. This QEP would include incentives for faculty to create new service-learning classes and/or community-based participatory research initiatives, such as our garden-based service-learning pedagogy and related food justice research projects (Aftandilian, n.d.; Dart, 2010). Faculty would also participate in a semester-long training program in community engagement that would include an introduction to critical service-learning. Students would have the opportunity to deepen their interactions with community members by completing semester- or year-long internships with community-based organizations. They could choose to pursue a minor in Community Engagement. And they could also apply for a program that would give them the opportunity to take leadership roles in teaching other students about community engagement and working more directly with both faculty and community groups to set up service-learning courses, research initiatives, and other campus-community partnerships. Although our QEP was not selected in the end, we were able to significantly raise the profile of community engagement at TCU through the process of preparing a detailed QEP proposal and formally presenting it to the TCU community.

Finally, as more community gardens and other food justice related initiatives crop up in Fort Worth, both we and our community partners

are becoming increasingly aware of the need to coordinate our efforts to make them as effective as possible. Food policy councils have proven successful at achieving both these goals (Clancy et al., 2007; Winne, 2008, p. 161ff), and we have been helping found one in Tarrant County based on an organizational model developed by the Texas Hunger Initiative. Such an organization could provide continuing opportunities for service-learning and for supporting community efforts to work toward food justice.

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Figure 1. Fairmount Community Garden, one of the study sites, is mixed-income and ethnically diverse, with large numbers of white and Latino/a residents. Here, students are applying mulch.