Community garden: A bridging program between formal and informal learning

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Abstract: Community garden activities can play a significant role in bridging formal and informal learning, particularly in urban children’s science and environmental education. It promotes relational methods of learning, discussing, and practicing that will integrate food security, social interactions, community development, environmental activism, and cultural integration. Throughout the last five years of my community garden activities, I have learned that community garden-based practices adhere to particular forms of agency: embracing diversity, sharing power, and trust building as a part of everyday learning. My auto-ethnographic study provides valuable insights for environmental educators whose goals include, incorporating ethnic diversity as well as engaging children in research, ultimately leading to community action.

Subjects: Early Years; Education Studies; Educational Research; Multicultural Education  
Keywords: community garden; formal and informal learning; auto-ethnography; participatory; children; environment and science education; self-determined learning

ABOUT THE AUTHOR
Ranjan Datta is a Bangladeshi-Canadian. He dedicated to building an inter-cultural bridge among Aboriginal, immigrants, and refugee communities in Saskatoon. He is known as a community activist on Indigenous and immigrant rights as well as making positive impacts on the community. He has received numerous accolades for community and research activities. His research interests includes: Indigenous education, rights, and practice; anti-racist theory and practice; social and environmental justice; community gardens; and Indigenous research methodology and methods. He actively engages with Student Teachers Anti-Racism Society (STARS), Multicultural Council, The Open Door Society, Food Bank, Aboriginal Friendship Centre, Community Radio, and the Saskatoon Car Share Co-op. He connects and leads various social justice movements in Saskatoon: Idle No More, Walking with our Sisters, Community Gardening, Immigrant Affordable Housing, LGBTQ rights, and Climate Justice. His current research focuses on building a bridge between formal and informal learning in the realization of cross-cultural practices, with a specific focus on science and environmental education.

PUBLIC INTEREST STATEMENT
There can be a mistaken impression that the science and environmental education (SEE) is only relevant to classroom-based instruction. However both (youth and adult) communities frequently engage in powerful SEE activities that take place after or outside-of-school, such as a community gardens. Together we have learned SEE content, engaged in SEE practices, and develop an understanding of how SEE is used in our everyday lives. To capitalize on those assets, educators and other stakeholders have a duty to learn about, leverage, and broker connections for youth across the SEE learning experiences that are available in and out of school. Throughout my five years of community garden activities, I have learned that a community garden can make a bridge between classroom SEE and practice that integrates environmental restoration, community activism, social interactions, cultural expression, and food security. In this paper, I have used my auto-ethnography from the community garden activities and education program to suggest the potential for community gardens to foster multiple types of learning.
1. Introduction

My environmental learning journey began in the community garden (near a local river known as Ganga) in Bangladesh. Like many other community members, my mother was an active participant of the community garden. It is from the community garden and participatory actions that I gained most of my knowledge and understanding about science and environmental education (SEE). I was educated in community gardening from my parents and my community. The collective local song and stories of our community were in regard to the river, animals, humans as well as sustainable learning. We were led by our Elders. I grew up with land-based learning, spirituality, and relationality in my everyday experiences. The positive feelings I have about community gardens have influenced my life greatly and directed my future endeavors. My childhood experiences about SEE include my family and our community’s collective knowledge, such as recognizing the importance of specific types of plants, soil, insects, harvests, and rocks. This collection of information forms our knowledge and shows us how there are many ways of practicing community gardens. Such knowledge was used for human and non-humans, including humans, plants, soil, rock, animals, the sun and the moon. The collective forms of knowledge are primarily our oral stories, and these are considered as SEE for our community. Community Elders, knowledge-holders, teachers, and medicine men used to use community gardens as a teaching tool for children as well as traditional medicine for the community. Thus, the SEE for myself was traditional knowledge and culture. A number of studies (Blair, 2009; Dirks & Orvis, 2005; Klemmer, Waliczek, & Zajicek, 2005a, 2005b; Smith & Mostenbocker, 2005) on community gardens argues that community garden-based learning and teaching can lead to the development of curricula and pedagogical approaches which maximize the use of these spaces for formal learning.

Despite the critical role that community gardens play as centers of local activity, it seems community garden-based programs have been missing from the school curriculum and city development plans (Loopstra & Tarasuk, 2013). I’ve also lacked the community garden-based SEE during my urban life (i.e. during my undergraduate and graduate education in urban areas in my home country’s university in Bangladesh and during my master’s education while abroad in Norway and the USA). I reflect on my struggles in the Western formal classroom-based SEE during my urban education. Many of my students in high school and university stated that what they had learned in the school classrooms, particularly in SEE classes, had little applicability in their lives outside of their class. Classroom SEE does not serve community interests and needs. For example, in my recent study, participants noted that the current schools’ SEE curricula were not connected with community food security and other local issues (Datta, 2016). There are a number of studies being conducted in urban settings, with limited studies to-date having examined how a community gardening program affects our SEE in food security and learning in city populations (Kirkpatrick & Tarasuk, 2009; Loopstra & Tarasuk, 2013; Morón, 2006). In spite of the interest in exploring community garden-based SEE programs, the informal learning that takes place is still poorly understood (Fisher-Maltese, 2014).

As an environmental educator, I view teaching and learning SEE to our children through community gardening as an ongoing collaborative and informal learning experience. The question “If I as teacher create, what, if anything, will my students learn and teach,” has been the mantra that has guided my practice. I aimed to teach and learn from our community that we live in so that together we could benefit from our learning. Through my childhood experiences of community garden learning and professional practices, I have come to realized that the formal (i.e. Western classroom-based) SEE and informal (i.e. community garden-based) should be connected. I believe, it is highly useful if formal SEE is connected with local culture and needs. This paper is my auto-ethnography in which I humbly share my learning experiences and the value of community garden-based SEE through a focus on informal land-based learning environments. Following participatory action research (PAR) this study is grounded and situated, experiential, and contextual and the purpose of this study was to examine the impacts of a community garden-based SEE on both adult and children.
My aim through this paper is to create a bridge between formal and informal SEE through community garden-based (i.e. land-based) practices. For this reason, I have divided this paper into the following sections: Section 2, I will explore why we need community gardens in SEE; Section 3, I will provide a short breakdown of our community garden; Section 4, I will explain research methodology by focusing on my auto-ethnography. Section 5, I will share my five years of community garden experience by focusing on how and why we need community garden-based SEE. Section 6, I will discuss how community-based practices have the potential to enrich our formal SEE. I will conclude (Section 7) with my vision for community garden-based SEE.

2. Why community garden?
The community garden has countless benefits for a community. A number of studies have suggested that the community garden not only enriches our formal and informal SEE teaching and learning opportunities, it also provides a number of benefits to the community. The benefits are such things as access to fresh food, cultural or spiritual practices, financial gains, socialization and education (Guitart, Pickering, & Byrne, 2012; Kirkpatrick & Tarasuk, 2009). Community gardening requires promotion and support more than ever (Fisher-Maltese, 2014; Guitart et al., 2012). For this I have briefly explained the meanings of community gardens and how it creates alternative SEE learning, and food security.

2.1. Defining community garden
The term community garden generally refers to “open spaces which is managed and operated by members of the local community in which food or flowers are cultivated” (Guitart et al., 2012, p. 364). Guitart et al. (2012) also refer to community gardens as an urban agriculture or backyard garden which is privately managed by a family. However, Indigenous studies in North America and South Asian Indigenous communities show that the idea of community gardens as a land-based practice has long been successful in many Indigenous communities (Cajete, 2001; Datta, 2015; Roy, 2002) it was simply labeled differently. Other Indigenous studies (Barnhardt & Kawagley, 2005; Sobel, 2004) have discussed that community-based learning is simply known as land-based SEE. Sobel (2004) explained that community garden-based learning is significant as it connects us with our place. By defining the importance of place in SEE, Sobel explains place.

As the process of using the local community and environment as a starting point to teach concepts in language arts, mathematics, social studies, science and other subjects across the curriculum. Emphasizing hands-on, real-world learning experiences, this approach to education increases academic achievement, helps students develop stronger ties to their community, enhances students’ appreciation for the natural world, and creates a heightened commitment to serving as active, contributing citizens. Community vitality and environmental quality are improved through the active engagement of local citizens, community organizations, and environmental resources in the life of the school. (p. 7)

Thus, the term community garden within this paper is considered as a land-based practice, which provides multiple opportunities to explore the role of SEE in a larger social-ecological system. More importantly, I consider community gardens as a way to bridge between formal and informal SEE as an ongoing process.

2.2. Alternative learning
Community gardens can be a vibrant alternative learning opportunity for many city families and their children’s SEE. For example, 83% of the US, and 81% of the Canadian population live in metropolitan areas (Statistics Canada, 2011; U.S. Department of Agriculture, 2006). The community garden can offer alternative sustainable plans for a large number of city populations and developers. The Kearney (2009) study on the City of Holyoke and City of Springfield, MA, USA shows that community gardens enrich the visions of the city. By growing organic fruits and vegetables on formerly abandoned lots, community gardens teach local youth about practicing agriculture, environmental stewardship, and community development. In the last three years, the community garden has also begun to promote bicycle ridership in order to further their vision of urban agriculture and to include
principles of sustainable living. Likewise, another study, Nelson (1996) shows that if gardeners establish a vegetable garden, the food grown will likely be organic, which suggests the possibility of teaching youth and children how to compost and the benefits of composting. As a result, a community garden can help to reduce the amount of waste accumulated in a community. Youths and children also learn practicality, such as why we need to compost? Therefore, community residents can experience SEE as dynamically linked to their urban environment. By advocating for city community gardens, Nelson claims that the city’s community garden projects can help to restore the connection to natural processes that have been obscured by mechanization in city.

The community garden-based SEE has not been the normative standard of experience in the school’s SEE curriculum (Mergen, 2003). Television, video games, and organized sports have taken the place of land or community-based education (Moore, 1995). As childhood becomes more structured, the places where children can play, now have boundaries (as in football fields, playgrounds etc.) and lack the appeal of intimate spaces grounded in the natural environment (Francis, Lindsey, & Rice, 1994). For children, a community garden is an open, informal, and land-based learning space, full of things to see, discoveries to make, and achievements to celebrate. Community gardening is attractive to pupils and educators and doesn’t require a lot of space or funding (Desmond, Grieshop, & Subramaniam, 2004) in explaining community garden-based SEE, Desmond et al. (2002) suggests, “Can we take every child into the wilderness? Maybe, but only occasionally! Can we take every child into the garden? Most certainly and daily!” (p. 78).

2.3. Food security
Food security is one of the main issues throughout the world, including already developed counties. The United Nations World Summit on Social Development (2010) clearly defined that lack of proper diet can lead to depression, poor memory, low IQ, learning disabilities, dyslexia, and ADD (Ross, 2010). The United Nation’s definition of food security,

> means that food is available at all times; that all persons have means of access to it; that it is nutritionally adequate in terms of quantity, quality and variety; and that it is acceptable within the given culture. Only when all these conditions are in place can a population be considered food secure. (United Nations’ Food and Agriculture Organization)

Health Canada’s (2012) report also showed that in 2011-2012, 8.3% of households, or almost 1.1 million households experienced food insecurity in Canada. Of that amount, 5.8% was reported as moderate and 2.5% was reported as severe. Recognized as an important public health issue in Canada, household food insecurity has been associated with a range of poor physical developments, education inadequacies as well as mental health issues including multiple chronic conditions, distress, and depression (Ledrou & Gervais, 2005; Vozoris & Tarasuk, 2003). The city I currently reside in (i.e. Saskatoon) has one of the highest poverty, mental health, and food insecurity rates among Canadian cities (Statistics Canada, 2012). According to a Saskatoon Health Region (2014) report, the Saskatoon child poverty rate in Saskatoon during 2011 was 27%. With over one in four children in our community directly affected due to not having proper access to sufficient foods.

By focusing on community garden-based SEE, a number of studies (Fisher-Maltese, 2014; Kirkpatrick & Tarasuk, 2009) identified that the community garden is connected with local issues, as it is able to create community’s food security. The community gardens can mitigate these effects of poverty due to food insecurity, says Saskatoon CHEP Good Food (2015). Although the number of community gardens in Saskatoon has almost doubled since 2012 (in 2012 there were 19 community gardens, in 2013 there were 25, and currently there are 34), the demand is far outpacing supply, said Saskatoon’s community garden coordinator with Saskatoon CHEP Good Food Inc. Davies, Devereaux, Lennartsson, Schmutz, and Williams (2014) study with children and community also suggests that for a large number of people in our society—children and adults—who live with challenging physical, mental health and/or education problems, gardening and community food growing can be especially beneficial.
Thus, the community garden can be understood as a land-based ongoing practice, which is a bridging process among teaching, learning, and policy-makers in the field of SEE. Community gardening not only fosters outcomes for individuals, but also for the larger social-ecological system.

3. Background
Our community garden is known as a McEown Park Community Garden and it is situated at the University of Saskatchewan in Saskatoon, Saskatchewan, Canada. It provides gardening space to residents living in university-owned apartments on campus during the months of May to October. The individuals who enroll to be a part of the McEown Park Community Garden have created a very diverse membership, over 20 countries and cultures are represented by the members. Members were enrolled in undergraduate to postdoctorate programs, and single students, as well as families were represented. The community garden facility included up to 56 families with almost 200 people including 40 children. Another four sharing plots were created for the local food bank as well as students and neighborhood communities without garden space. For six months over each of the five years, the garden has operated more than 40 children have been involved in gardening activities. Many of these children are there daily, particularly during weekends and summer when schools are closed. My family with four members (two children, my spouse, and myself) have been involved with our community garden activities for the last five years. As an international student family, we have experienced the reality of the challenges faced with financial difficulty and the ability to purchase fresh or organic foods from local stores. Our community garden plot provides six months of fresh vegetables to our family.

In participating in a community garden, our target was not only to harvest food, but also a strong desire to learn SEE by making intercultural connections, teaching, and learning with others, as well as contributing to building a sustainable garden community. Besides growing and harvesting, our community garden provides a number of other activates for community children and adults alike. The activities include such things as art work, yoga, Aboriginal knowledge sharing, storytelling, music, dance, cross-cultural cooking, food sharing, and children’s birthday parties.

4. Method
This study is based on an auto-ethnographic study that has developed from collaborative understanding in my family’s roles as community gardeners and as a community garden coordinator. Since my family and I have been actively engaged with this community garden, I have seen this community garden as a continuous participatory learning opportunity for my family and myself. Therefore, I consider my auto-ethnography as PAR. It is here that I have used the PAR approach from a relational framework, which epistemologically challenges and deconstructs stereotypes, notions of unified voice, and authentic western fixed ways of understanding (Datta et al., 2014). I am not suggesting that there is only one way to interpret Indigenous relational meanings of life and relationships, but rather that a PAR approach embraces diverse ways of understanding and takes a serious position to avoid unconscious and uncritical imposition of Western authentic otherness. Indeed, PAR in this research, according to Wilson (2008), tried to understand participants’ relationships “rather than treating participants only as source of research data” (p. 177). Through this PAR, I am able to see myself as an active participant, participatory environmental educator, and researcher. I used the term “auto-ethnography” according to Hayano (1979) coined to describe ethnographic research done on one’s “own people” through an insider’s perspective (p. 99). Auto-ethnography in PAR includes personal stories, discussions, reflections, note-taking, emotional recall, and identification of categories and themes. Thus yielding a narrative that affords both the inside view of a research participant and the outside view of a researcher (Ellis, 1998; Ellis & Bochner, 2000). In following, I have explained why I chose auto-ethnography by focusing on freedom, relational, co-creative, and social well-being.

My auto-ethnography in my PAR provides a process of controlling opportunity in my stories regarding the knowledge I acquire and what I share. It “fluctually moves back and forth, first looking inward, then outward, then backward, and forward, until the distinctions between the individual and
social are blurred beyond recognition and the past, present, and future become continuous” (Ellis, 1997, pp. 132–133). As Ellis, Adams, and Bochner (2010) discuss, my auto-ethnography approach can also challenge “Canonical ways of doing research and representing others and treats research as a political, socially-just and socially-conscious act. A researcher uses tenets of autobiography and ethnography to do and write auto-ethnography” (p. 1). Through my auto-ethnography I have not only written about my experiences, but I had complete freedom and control of my personal stories. Thus, auto-ethnography for me, was a tool of self-empowerment, what Ellis et al. (2010) call both process and product.

Auto-ethnography considers “relationality” a crucial dimension of inquiry (Ellis, 2007, p. 25; Trahar, 2009) that must be kept uppermost in our minds throughout the research and writing process. My role as a gardener and garden coordinator were grounded in the tenets of PAR, which has the explicit agenda of pursuing research for building relationality. Relationality in auto-ethnography enriches not only collaborative learning, but it can also reshape the classroom-based SEE from the community garden-based activities. My auto-ethnography in PAR focuses on community’s interest and needs (Datta et al., 2014). It can challenge the classroom-based SEE tradition of dualistically separating objective and subjective, research and researched, researcher and participants, knower and known (Noffke, 1997). For example, throughout the last five years of my community garden activities I have learned that knowledge and the way in which knowledge is produced does not emerge only objectively, rather occurs within collaborate participation such as in cultural, relational, spiritual, economical, and environmental contexts (Ellis, 1997).

Auto-ethnographic in PAR can enhance participants’ well-being (Ellis, 1997). For example, my continuous participation in garden activities and garden rights movements is not only separate from my identity of “who I am?” or my culture “where am I coming from?” or from my education “what should I learn and why?” or from my spirituality “how should I build my relationships?” That is, if, as Titchen and Hobson (2005) states that auto-ethnography can lead in bringing participants’ well-being. I also believe that SEE learning does not come from somewhere else as it is situated within everyday relational practices. For instance, our community garden has been providing a sense of well-being through belongingness that we (as international students and my children) were missing during higher studies in our home country and abroad in our urban life. In our community garden, we had multiple forms of participants’ well-being, such as connection opportunities with the land, learning from land, and teaching our children. There was also a sense of belonging and the freedom to share and practice our culture.

My auto-ethnography is a continuous process of co-creative learning. Co-creative learning is a process of collective creation. This co-creative learning can challenge Western classroom-based SEE. For example, in Western classrooms the children used to define their ways of understating science by playing with soil, plants, and insects. This informal co-creative learning was connected with our everyday garden practice. Inspired by creative learning, I was not interested in researching the concept of SEE or teaching what people know about SEE, rather my focus was to understand how people co-create and understand SEE through everyday garden-based practices. For this, I have shared my personal stories with others, and others have shared their stories individually and in groups. I found that sharing personal stories in auto-ethnography can co-create many learning possibilities: such as (1) creating collaborative needs, learning, interests, and cooperation, (2) can co-create ongoing meanings of SEE and put it into practice, and (3) can situate our SEE learning and teaching with the land.

Thus, my auto-ethnography focus on the participatory process of teaching and learning what I call a participatory learning opportunity, highlighting what I have learned from freedom, informal, and relational learning.
5. Findings
Through my auto-ethnographic I wanted to learn and understand: How does community garden-based learning provide more than just harvest production? How can we co-create SEE from our garden practice? How do we control our SEE knowledge? During the five years of gardening experiences in various community gardens, I have learned that a community garden not only provides harvest but is able to create a relational and learning space for children, youth, and parents. Therefore, our community garden (for my family and I) has given us interconnected multi-learning opportunities such as: community gardens provides food security with nutrient-rich fruit and vegetables, which are lacking in our diet; it can provide an open informal learning space; build cross-cultural networks; inspire environmental activities; and breaks down artificial boundaries in gardening.

5.1. Food security
Community gardens provide a control on our food security and health. For example, our community-based garden extends nine months of food security for my family that we could not previously afford. As an international student family, we faced many difficulties in buying vegetables from the grocery store. Since we had a limited budget and our requirements to cover tuition fees and accommodation costs, we were forced to look for the most inexpensive vegetables in the grocery store. I can recall how these limitations prevented us from having vegetables in our daily meals for six days out of seven. For instance, we once traveled to the store to purchase vegetables and unfortunately arrived back home without any, as the cost of one tomato was more than one dollar which was too high a price for an international student family. This wasn’t an occasional occurrence; it was the reality during six years of undergraduate and graduate studies.

Currently, our community garden provides nine months of vegetables (i.e. organic). We also believe that a good diet is essential to our education. Learning how to grow good food not only improves our physical health, but also develops our mental health. Through community gardens, we can teach our children how to grow, prepare, and eat nutritionally. This learning process helps our children to understand what makes a healthy diet while educating children to like and enjoy nutritious homegrown food. Showing the link between what they grow, what they eat, and how they feel. For example, it was very difficult to explain to our children why we were unable to purchase fresh foods from the store because the expense was too high for our limited budget. Once we had community garden harvest, I observed my children sharing our harvesting story with their friends, teachers, and others. In our garden, we can choose what vegetables we want to harvest as well as the quantity of what we grow. We know how we are growing our vegetables, and where they are coming from, and in which way we are connected with harvesting.

5.2. Open learning space
Our community garden is an open learning space for our children as it provides space for play, art work, music, and study. In school classrooms, children have to follow many rules, but in a community garden, children are able to be free and enjoy fresh air and friendship with others. The community garden is a highly practical and direct form of education, where children can see the results of their decisions and actions. Our children have had the opportunity to play and study insects, build tables, measure rainfall, learn math, and define science. In community gardens, children are able to create their own knowledge through garden art, photos, drawings, and music. This learning space helps to build belongingness among children. For instance, children learned SEE in their own way. More than 40 children use our garden space to play, create knowledge, and to make connections with soil, plants, and insects. At the start of the garden period, children did their artwork at the garden, they drew different imaginary plants, insects, and named each plot. They defined their knowledge and made connections with classroom science.

Community gardens are used as an open learning space. Schools and university educators were invited to visit the garden, create a model garden and distribute seedlings. For example, like other children our children gave a presentation in their school’s classroom about science, they titled it “all about gardening.” In the “all about gardening” presentation they (our children) created garden art,
showcasing how they used to work, play, and do music almost every evening. They explained what foods they liked best and why.

5.3. Informal learning space
The SEE was an informal relational learning experience for our community garden children. For example, like other children in our garden community our children also investigated the characteristic of different types of soil in the garden by collecting, playing, and analyzing soil samples. They recorded their observations during a six-month gardening period. The children also demonstrated scientific thinking by playing in groups, group discussions, music, art work, harvesting, and participating in other related activities. Since many children have been actively engaged in garden activities, they were able to explore the relationships among various insects, bugs, plants, and soil.

I have seen how our garden children explore their SEE by protecting the space for bees. For example, our garden children wanted to retain two garden plots just for weeds, so that the bees were able to make use of these plots. We have since seen thousands of bees in these two plots. The children have also observed how bees flew from one weed to another, and witnessed the pollination of flowers. They understand why bees are important from classroom SEE. Through community gardens, our children are able to make connections between formal and informal knowledge.

Most of the informal learning occurs by playing in the community gardens. For example, children created friendships with ladybugs by caring for the ladybugs and going on to explain the importance of their experience to their friends. Children often played with mud and plants and had an opportunity to explore relationships with different types of soils and plants. They also identified why we need different types of soil for different types of plants and animals. I have also observed how the children's unique ideas through their garden art work has provided diverse water conservation strategies. Children have explored and reflected the meaning and the diverse characteristics of various plants. Moreover, they were effectively engaged in identifying the significance of native plants in our garden. For this, we dedicated an entire day to a Saskatchewan Aboriginal community garden tour and learned the significance of various plants in Saskatchewan Aboriginal SEE. I noticed that after our tour during the Aboriginal community garden, most of the children, including our children, discussed what they had learned and identified relationships with various plants and soil.

5.4. Cross-cultural learning space
The community garden is a living laboratory for cross-cultural SEE. In our community garden, the majority of garden members are from various cultures such as international, immigrants, Aboriginal, and domestic students’ families. The gardening is a simple opportunity for them to have access to land allowing them to grow their own food and to help them to connect to Saskatoon and their new home, in a way they had never experienced before (Follow link for a specific example on the intangible impact of this initiative). The community garden is important for the gardeners to develop a sense of ownership toward the space. Since gardeners are from cross-cultural backgrounds, they bring forth their cultural bridging opportunities. Through this learning process, the student gardeners not only include their spouses and children, in many cases, students bring their parents and in-laws with them as well.

In addition to cultural bridging, community gardens also enhance cross-cultural learning for children. For instance, I have witnessed that the children discuss their rights and responsibilities in Canada. They have compared how decisions were made in their communities and identified how leaders should be chosen through garden activities including the election processes. Children also explored why cross-cultural garden-based learning was important for city development.

5.5. Networking
Community garden-based learning provides an opportunity for a social network. For example, since our gardeners were mostly from international and immigrant students’ families, the immigration processes lead to the loss of essential social networks and had the potential of leaving migrant...
families feeling isolated (Bathum, 2007). This is especially true for many international and immigrant students’ spouses who had spent much of their time at home, often expressing feelings of isolation. One of the gardeners spouse said “I feel like I’m a farmer when I come here, it gives me so much belonging with mother earth, with this community, with this garden, with family and friends and everything.” For this spouse group, the community-based garden became an important factor for building networks and carrying the tradition of a family garden with them from their home country. This networking is not limited within community. Now we can share our garden food with friends, teachers, and local food banks. Through network community gardens, we can teach others how to share garden harvests. For example, we have four common plots for all students, and the purposes of these four plots are to share the harvest with the local community, students without garden plots as well as local food banks. This sharing process is not only limited to the harvest, but also helps us toward building our responsibility toward our community. Through the process of sharing, community gardeners increase their learning opportunities among each other. These types of learning opportunities with a significant number of immigrants, domestic and international students’ communities have a tremendous impact on the students’ communities. It has helped to increase caring among each other, exchanging child care, education sharing, and developing peer groups.

5.6. Environmental activities
Our community garden enhances environmental activities as part of SEE among children and adults. For example, like other children our children have not only learned methods on reducing water waste and how to produce more of their own harvests, but also in the satisfaction of sharing their success stories with their school, teachers, and friends. I have seen that our children have provided advice to their friends on how and why it is important not to abuse water. They have also made water protection projects in the garden through art and have presented those ideas in their class and on local community radio. There were other environmental activities I have seen among children, parents, and grandparents through various kinds of social activities at the garden such as cross-cultural cooking festivals, yoga, storytelling, and birthday parties.

5.7. Breaking boundaries
Our community garden can change socially constructed boundaries such as men and women, national and international, black or white, nature, and culture. For example, in our community garden, we have 60 plots with 20 different nationalities. As an example, we divided 56 garden plots among diverse groups of student such as Aboriginal, Caucasian, immigrant, and international students’ families with children and without children, single students, and students of the LGBT community. In our garden, we do not see age, gender, and nationality as barriers, rather we see we are in a common place where we can learn from each other and share our knowledge.

Therefore, for us, our community garden is a land-based relational learning and sharing space. This informal learning teaches us union and compression. It also teaches us the significance of enough, sufficient, and adequate. I feel the end of formal SEE is the joy of learning.

Based on our gardening experiences, I have seen that a community garden can build a diverse sense of community by changing classroom-based artificial learning boundaries, creating multiple ways of understanding, networking, and developing an informal SEE culture as part of collective sense of community. First, our community-based garden allows the time necessary to develop a successful relationship between academic partners and community members that are essential when a lack of trust initially exists. Secondly, our community garden-based learning can alleviate perceptions of potential racial discrimination, especially with regard to immigration status, which can be a barrier to successful collaboration. Thirdly, community garden-based learning combines the expertise offered in study design and evaluation from academic partners with important insights provided by community members. It creates unique synergies, that when successful, can result in important research collaborations. Finally, community members have special knowledge about the individuals that live in their communities and that is vital to choosing cross-cultural methodologies that will foster trust.
6. Discussion

Today, at a time of multiple crises in SEE intensified by globalization, we need to move away from the paradigm of Western formal learning as the only classroom-based learning. We need to move to a land-based (both formal and informal) paradigm, and for this, the best teacher is land herself.

This is the reason I began community gardens. I did this for community and for my children’s SEE. Therefore, this study shows the importance of the community garden as land-based understandings, learning, and practices (Massey, 2005; Tuck & McKenzie, 2015). My auto-ethnography has revealed that community garden-based learning values partake in multiple ways of understanding SEE from the community’s perceptive. As I have discussed, the Western academic discourse and the SEE concept are used in different ways within community participation (Atkinson, 1999). This difference may be illuminated along the following lines: the Western sense of SEE has been widely criticized as positing humans (particularly Western men) as a superior life form with an inherent right to use and control nature toward individualistic ends (Escobar, 2008; Vos, 2007). The community garden, in contrast, sees all practice and learning entities in a relational context, and stresses interdependence and justice for all life forms (Lauer & Aswan, 2009). My auto-ethnography has also revealed that SEE and practice were not separated issues in our community garden. Together we identified that the community's concept of SEE is about food security, agency, and relational learning.

It is increasingly recognized by individuals and health professionals alike, that gardening and food growing is beneficial for our health and well-being. A community garden can have positive impacts on a pupil's nutrition and attitudes toward healthy eating, specifically related to a willingness to try new foods and expand taste preferences (Draper & Freedman, 2010). Alaimo, Packnett, Miles, and Kruger (2008) reported that household members who participated in community gardening consumed 40% more fruits and vegetables per day than those who did not; they were 3.5 times more likely to consume the recommended five portions a day of fruits and vegetables. In a similar point, Orme et al. (2011) showed that following their participation in community garden programs, the proportion of primary school-age children eating five or more portions of fruit and vegetables increased by 28%. Our community garden also increased vegetables in our daily meals by 300% for six months. This increased amount of vegetables in our daily meal information can assist people to cope with the symptoms or treatment of serious mental and health problems (Zick, Smith, Kowaleski-Jones, Uno, & Merrill, 2013).

Community garden-based practices enhance our knowledge that our community garden has the ability to increase learning through our children. Throughout my last five years of community garden activities, I have learned that community garden-based practices adhere to particular forms of agency: embracing diversity, sharing power, and trust building as part of everyday learning (Amoamo & Thompson, 2010). In our garden community, soil, plants, insects, and people have agency to make us collective and promote environmental well-being. I also discovered from our children activities that each insect has an influence on the community’s harvest production, consumption, needs, time, surplus, and distribution. One of our fellow gardeners' mother (who is also a gardener) expressed that “each animal, plant and species has its own supporting power.” Another fellow gardener also expressed that “we used to practice participatory community gardening in our home country [outside of Canada], I am so happy to find we have a similar opportunity here. This garden provides significance and power for my family.” Therefore, the idea of a community garden has legitimacy to provide a welcoming space for community participants to build self-confidence, wellness, and personal skills (Fulford & Thompson, 2013). Therefore, I realized, through five years of community garden activities that we are much more active, happy, healthy, and untied.

Through the community garden, participatory practice honors the diversity of everyday life, which promotes relational learning (Fulford & Thompson, 2013). Such diverse relational aspects of participatory practices represent various agencies in building our community. Through relational learning, community gardens can teach us how to build trust among children. The sharing cross-cultural gardening experience (i.e. planting, cultivating, learning and spiritual celebrations) is considered a
social capital and trust-building process within the community. I noted that children in gardening activities experienced trust building as well as gaining valuable knowledge, such as how to recognize particular plants and insect behaviors and their purposes and how to build relationships and care for these plants and insects (Firth, Maye, & Pearson, 2011). Through relational learning, trust appears to be a determinant of success across generations in a diversity of learning processes: a requisite to building and sharing knowledge and fostering effective relationships (Berkes, 2009). For example, another fellow gardener stated to his children: “we consider our garden to be like our parents. They take care us, and our responsibilities are to take care them. Therefore, we cannot sell them or use them for profit.” Such relationality can offer scientific learning opportunities. For children, community gardening has scientific and ecological significance. We have discussed with our children that community gardens can offer multiple ecological and sociological solutions such as spiritual and relational. Garden activities can reduce species extraction and food crises. Traditional management knowledge can increase plant and insect species diversity, women’s decision-making powers and our children gain empowerment as well as knowledge in producing organic fertilizers.

Thus, community gardening as land-based SEE promotes participatory ways of discussing and practicing our ways of understanding. Such patterns of learning are helpful when connected with local culture, tradition, and needs (Jermé & Wakefield, 2013).

7. Conclusion
To analyze community gardens, this auto-ethnography began by casting a critical eye at the notion of SEE. Visions of community garden-based activities can be seen as a relational land-based learning in opposition to Western meanings of solely Western classroom-based SEE. I also understand that community gardeners now engage with many decentralized approaches to environmental education which offer opportunities of Western SEE to promote informal and cross-cultural diversity in learning.

Through land-oriented community gardens, gardeners call for a sincere attempt to recognize cross-cultural knowledge which promotes and protects its values and encourages diversity. From my experience, I would like to advocate participatory land-based SEE for urban policy-makers, school board science curricular as well as researchers. I also look forward to future evaluations of its general effectiveness in guiding practitioners and researchers of scientific and community knowledge integration in SEE. As an environmental educator, researcher, and community gardener, I would like to see the community garden-based learning and practices become recognized as equivalent to the western SEE. As a result, this auto-ethnographic study presents a compelling request to create the circumstances in which gardening and community food growing can thrive, for the benefit of everyone.

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Notes
1. I used term Western according Haraway. She argued that the western science education has perhaps been too simplistic, too projected, and too far from local practice.

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