CULTIVATING PARTNERSHIPS AND PUTTING DOWN ROOTS: FAMILY AND COMMUNITY INVOLVEMENT THROUGH VEGETABLE GARDENING

by

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(Under the Direction of David W. Wright)

ABSTRACT

Because of the limited understanding of learning in school gardens, a participatory action research study was conducted. A school enrichment cluster enabled a group of diverse students to explore their interests in vegetable gardening. Using a social constructionist framework, with sociocultural theory and funds of knowledge, I inquired into the process of learning and developing partnerships in school gardens. Qualitative data collection methods were utilized through observations, interviews, weekly family letters, and artifact collection. Through participatory action research, the students formed a community as they identified a problem, exchanged information to plan, and evaluated their actions. Teachers participated in their action plan and guided them in accessing funds of knowledge from family and community members. As they learned in the garden experientially, they learned about regionality, seasonality, and plant resources. They became collaborative action researchers and as they evaluated their garden accomplishments, they initiated social transformation in their community with their future aspirations of eating garden produce in the cafeteria. This study

also addresses the learning implications of school gardens, as well as the challenges that can arise when collaborating with families and community members. Future actions within the local community are also discussed regarding the function of school gardens as community spaces, as well as farm to school opportunities.

INDEX WORDS: Family Involvement, Participatory Action Research, Community Involvement, Vegetable Gardening

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To the world – please do not forget your place on this earth. Do not lose reverence for it, and try to appreciate what it gives you. If we do not continue to cultivate our appreciation, it may lose its ability to provide for us. My hope is small – make your garden grow!

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CHAPTER 1

INTRODUCTION

There are limited opportunities for young children to interact with the earth during school and make connections between their lives and the environment (Berkowitz, Ford, & Brewer, 2005; Peloso, 2007). However, there is currently a 'green movement' occurring that is promoting various methods in which people can actively participate in making the world a better place (Lo, Affolter, & Reeves, 2002). People in positions of power are advocating for change, and authors are bringing awareness to society about the importance of making that change (Pollan, 2007; Waters, 2006). Richard Louv (2005) addresses what he calls "nature deficit disorder" (p. 1) in children, and is advocating for children to experience the outdoors. Although there are varying intentions behind ideas of being green or experiencing nature, each advocate group is similar in its desire to provide opportunities for education in early childhood (Louv, 2005).

When young children enter elementary school, particularly in kindergarten, 1st and 2nd grade, instruction related to environmental education and sustainability directly related to the food they may or may not encounter on a daily basis is limited (Berkowitz, Ford, & Brewer, 2005). As initial inquiries do occur, children often do not know how or where food is grown (Liquori, Koch, Contento, & Castle, 1998). When attempts at environmental and agricultural teaching occur, students are often only told about the origination and lives of vegetables and animals, or they take field

trips to locations outside of their communities to visit large farms that are disconnected from their lives (Kahn, 2009). Rarely are there long term, in-depth explorations of the work and science behind a successful, sustainable farm or existing school garden (Nimmo & Hallett, 2008). If children do not have the opportunity to see what the earth can provide, in meaningful ways, then they will continue to lose appreciation for it and food (Kahn, 2009; Louv, 2005). School gardens are one way to do this, and can be successful, particularly when students actively choose to participate (Clarke, 2002; Subramanium, 2002).

In some classrooms, interest-based learning is facilitating children's learning by providing information about topics children want to learn about (Renzulli, 1978). As children become active learners, their families are encouraged to be a part of the learning process, giving them the opportunity to investigate and learn about something they may not have otherwise experienced alongside their children (Nimmo & Hallett, 2008; Subramanium, 2002). One topic that can be engaging for both children and families is food sustainability (Waters, 2006). Although this can be a complex issue, young children and their families are able to think about the benefits and disadvantages of both transporting and growing food (Hyun, 2005). In the world that we live in today, where green movements are taking hold, it is our moral responsibility to respond to inquiries that children and communities make, facilitating an awareness of the environment and our responsibility to care for it (Blair, 2009; Kahn, 2009; Nimmo & Hallett, 2008).

In elementary schools across the country, teachers and/or community organizations are increasingly introducing school gardens, albeit in varied and

individualistic ways (Malone & Tranter, 2003; Nimmo & Hallett, 2008). Some vegetable gardens are integrated into the curriculum, while others are used for after-school programs (Subramanium, 2002). Even still, some gardens literally occur organically as teachers fulfill children's requests to get their hands dirty (Clarke, 2002). By providing tangible and meaningful connections, students feel encouraged to think and express their thoughts to others (Laevers, 2000). In particular, as children go outdoors and watch in real-time as food is produced, their engagement in learning is increased (Malone & Tranter, 2003). Creating connections between what is growing outside of their classroom window and their community facilitates a greater understanding of their impact on the world and allows them to form relationships with each other, family members, their community, and the earth (Malone & Tranter, 2003).

As they share knowledge with one another in the classroom, both the student and the teacher are learners together. By allowing connections to be made, students see learning as something they can invest into their communities, which also fosters trusting relationships between families, communities, and schools (Blair, 2009; Nimmo & Hallett, 2008). If partnerships are developed, then the opportunity for learning grows (Waters, 2006). In addition, these relationships act as the foundation for the sustainability of the garden, allowing children to continue gaining not only food, but also knowledge (Malone & Tranter, 2003; Nimmo & Hallett, 2008).

In the early 90's, Alice Waters created The Edible Schoolyard Project that focused on eco-literacy by combining hands-on, experience-based opportunities in a working garden, as well as a movement from the farm to the table (Waters, 2006). A

main reason for the success of the Edible Schoolyard concerns the partnerships that were created between children, schools, and communities. By forming relationships, each community became a stakeholder in the Edible Schoolyard (Peloso, 2007; Waters, 2006).

Due to the push to take action and change the way we view the environment, there is an emerging focus on environmental education in early childhood (Blair, 2009; Clarke, 2002). Researchers are talking about the importance of it for children and some teachers are sharing work they have done with students in their classrooms (Mayer-Smith, Bartosh, & Petarat, 2007; Nimmo & Hallett, 2008). However, little research is done on the planning, implementation, and experience of learning about the environment. Most current research involves quantitative studies that examine how gardens influence or improve test scores and nutrition (Blair, 2009; Coyle, 2010). Although helpful, this research does not provide a specific view of garden experiences for teachers, children, and other involved members (Blair, 2009). In some cases, qualitative studies have tried to present experiences in the garden that are more nuanced and situated in particular communities, highlighting elements of place-based and eco-literacy opportunities that exist in school gardens (Blair, 2009; Cutter-Mackenzie & Smith, 2003).

School gardens can be beneficial for all children, but each garden serves a different purpose for the particular children and community involved (Blair, 2009). In low-income areas, community and/or school gardens can be used to provide food for the families involved (Ratcliffe, Merrigan, Rogers, & Goldberg, 2009). Resources may be limited for families, so gardens provide sustenance beyond the nutrient-less

food that is affordable (Casey, Szeto, Lensing, Bogle, & Weber, 2001). Gardens also allow children and families to work together, learning how to cultivate plants and harvest the fruits of their labor (Nimmo & Hallett, 2008). Opportunities to connect families to school and projects their children are involved in are discussed often in educational research (Davis & Yang, 2005; Swap, 1993; Vopat, 1994), as well as garden-based learning (Blair, 2009; Coyle, 2010). However, limited information exists related to how interest-based instruction helps facilitate these connections, particularly when schools strive to integrate families into their educational practice (Novella, 1999). The review of literature addresses the current state of educational opportunities related to the environment, opportunities for knowledge, and how different communities, such as families, environmental professionals, and educators can develop partnerships to enhance the opportunities for learning in the garden.

As the push for environmental education is being made, educators are responding (Blair, 2009; Nimmo & Hallett, 2008). Gardens are increasingly becoming a part of the schoolyard landscape, but the integration of them into the existing culture of learning is difficult (Gruenewald, 2003). Young children still have limited opportunities to engage in learning outside of the classroom (Peloso, 2007). If the process of learning experientially is made clearer, particularly with the help of community stakeholders, then the possibilities for growth in the garden are limitless (Wake, 2007).

CHAPTER 2

LITERATURE REVIEW

What are School Gardens & Why are they Important?

> Being responsible to one's self cannot be separated from being responsible to the planet. I know of no better way to get this lesson across than through a school curriculum in which food takes its place at the core level. From the garden, and the kitchen, and the table, you learn empathy–for each other and for all of creation; you learn compassion; and you learn patience and self-discipline. A curriculum that teaches these lessons gives children an orientation to the future– and it can give them hope. (Waters, 1997 as cited in Peloso, 2007, p. 5)

Gardens can represent a sense of wonder and enjoyment, particularly in childhood (Wake, 2007). Having the experiences in childhood can also influence the path that children will take and the awareness that they have of the world. As part of school garden experiences, a responsibility to be a citizen of the earth is often a conscious effort (Clarke, 2002; Peloso, 2007; Wake, 2007). Today, most gardens instill a sense of stewardship, focused on the idea that children are "interacting with the garden rather than gardening in it" (Wake, 2007, p. 32). By providing that experience, Wake (2007) believes that children can truly become invested in the garden and carry those ideas forward with them into their lives. She also proposed that children be able to make meaning through discoveries, experimentation,

interactions, and dialogue with peers (Wake, 2007). Using these principles of learning in the garden, children construct meaning and ownership of gardens, and provide further evidence for the use of exploratory, interest-based instruction in school gardens (Blair, 2009; Clarke, 2002; Ozer, 2007).

In addition, children should be involved in the garden from the very beginning (Clarke, 2002). Instead of walking into a ready-made garden environment, children should plan, construct, and cultivate, participating in every step of the process (Wake, 2007). In doing so, the sense of ownership is supported further because it is not a garden for children, but a garden by children, based on their interests (Clarke, 2002; Wake, 2007). As a garden is constructed, providing spaces that facilitate interaction is important as well, so children feel that they can get in the garden and play. This can be done with bean tee-pees, mazes, and other interactive features (Wake, 2007). However, it is imperative to include adults in the process as well (Nimmo & Hallett, 2008). Teachers, parents, and other community members provide invaluable knowledge and experience in gardens, even engaging children in conversation about what is happening, stimulating interest and development in simple to complex topics (Wake, 2007).

Although sometimes the space is initially barren, it can grow into wonderful gardens that provide laboratories for children to explore and experiment (Chatterjee, 2005; Gruenewald, 2003; Nimmo & Hallett, 2008). By supporting relationships between children and the earth, as well as others in the community, a sense of place and nurturing can occur (Green, 2007). When this happens, children

may be more invested in their communities, as well as develop understandings of what their community has to offer (Chatterjee, 2005; Green, 2007).

The use of gardens as pedagogical tools is increasing, but many teachers are still primarily remaining indoors to provide instruction (Green, 2007). Because of increased accountability from No Child Left Behind and standards-based initiatives, teachers can feel confined by time and tools at their disposal (Gruenewald, 2003, No Child, 2001). In many cases, when time is limited, time spent outdoors decreases as well, leaving children without the opportunity to bathe in the sunlight (Louv, 2005; Ozer, 2007).

As the world develops new technologies, children are increasingly playing indoors, losing the connection that once existed with the earth (Blair, 2009; Louv, 2005). In addition, 83% of the people in the United States live in cities, with limited exposure to nature (Blair, 2009; Malone & Tranter, 2003). However, some teachers are moving outdoors and utilizing the space that exists in the schoolyard (Green, 2007; Nimmo & Hallett, 2008; Malone & Tranter, 2003). In recent studies, teachers appear to perceive school gardens positively, particularly in regards to curriculum standards, as well as general life style habits (Ozer, 2007).

In an attempt to reconnect children to the dirt underneath them, place-based initiatives have been utilized, using gardens because they "are intensely local" (Blair, 2009, p. 17). As children experience gardens, they directly affect the potential growth because the "garden exists because of human interactions with plants" (Nimmo & Hallett, 2008, p. 4). In Oregon, the surrounding community is so important that the entire curriculum reflects issues related to environmental

conservancy in the area (Smith, 2002). By doing so, the students are learning about fundamental concepts while engaging in activities that are tangible and have immediate relevancy and importance to their lives (Green, 2007; Smith, 2002).

Learning Implications. As educators begin to use school gardens as educational tools while inside and in the school yard (Oxenham & King, 2010), it is important to understand how teachers are integrating garden activities into their classrooms during math, science, social studies, and reading, particularly in an era of standards-based education (Robinson-O'Brien, Story, & Heim, 2009). In some cases, educators are incorporating environmental and agricultural initiatives in their classrooms to address issues of eco-literacy and health and wellness (Heneman, Junge, Schneider, & Zidenberg-Cherr, 2008). Although the scope is limited in terms of existing literature available, the studies that have been done present information that is promising for the success of school gardens to enrich students' lives (Robinson-O'Brien, Story, & Heim, 2009). In the following review, the knowledge gained from gardening experiences in school, such as nutrition, ecological literacy, learning achievements in content areas, as well as life skills will be presented. Following that, the literature on educators, families, and community roles in gardening will be presented to show how important partnerships are for success in the schoolyard, and implications for future farm to school programs.

***Nutrition Awareness*.** Nutrition is an important part of children's development, and is a topic that is under scrutiny as rates of obesity and overweight are increasing among young children in the United States (Oxenham & King, 2010, Robinson-O'Brien, Story, & Heim, 2009). In some cases, the resources of families

may be limited to provide good quality, nutritionally dense food (Casey, Szeto, Lensing, Bogle, & Weber, 2001; Ebbeling, Pawlak, & Ludwig, 2002). In others, a lack of knowledge about the nutritional needs of children may be a factor (Oxenham & King, 2010). Regardless, there are movements to combat the increase of obesity and overweight and provide children and parents with the education to make informed decisions about what they consume (Ebbeling, Pawlak, & Ludwig, 2002).

In lower socioeconomic areas, there is an increased risk for overweight and obesity that is attracting interest for community garden groups (Burdette & Whitaker, 2004; Casey, Szeto, Lensing, Bogle, & Weber, 2001) These areas often have limited resources, and families participate in government assistance programs to supplement their food resources (Casey, Szeto, Lensing, Bogle, & Weber, 2001). In lower income areas, these programs are in place to provide food to children whose families cannot afford them (Food & Nutrition, 2010a; 2010b). However, the grocery items given to the children must be shelf-stable and are therefore processed foods from cans and bags (Finkelstein, Hill, & Whitaker, 2008). Children of families who participate in these types of programs are often not introduced to higher quality; fresh produce with higher nutrient values (Casey, Szeto, Lensing, Bogle, & Weber, 2001). To provide families and their children with opportunities to have access to fresh food, community and school gardens have been implemented that allow families in the community to be directly involved with the care of the garden, or the recipients of the food harvested (Heim, Stang, & Ireland, 2009; Nimmo & Hallett, 2008). In situations where families are given access to fresh foods, they self-

report an increased consumption in healthy foods and positive health results (Morland, Wing, & Roux, 2002).

In public school systems, the United States Department of Agriculture (USDA) provides nutritional guidelines that school food service personnel must follow (USDA, 2003; Joshi, Azuma, & Feenstra, 2008). The guidelines are cumbersome, restrictive, and can be limiting in offering nutritious food (Finkelstein, Hill, & Whitaker, 2008; Joshi, Azuma, & Feenstra, 2008). Because this issue is currently being debated across the nation, the USDA and other government officials are introducing programs to confront the issue. The Center for Disease Control has said that school environments should promote health initiatives, through physical activity and encouraging healthy eating habits (Oxenham & King, 2010). The methods that schools use depends on the resources and curricula, but some schools have chosen to integrate agriculture as a way to promote nutrition (Heneman, Junge, Schneider, & Zidenberg-Cherr, 2008; Subramanium, 2002).

Although limited research exists about how school gardens can influence obesity rates, anecdotal evidence is often provided as a justification for future research (Oxenham & King, 2010). In a study that looked at a nutrition education program's impact on 4th grade children's vegetable preference, those in the nutrition education group with gardening scored higher on a vegetable knowledge assessment and preferred more vegetables than those just in the nutrition education group alone (Morris & Zindenberg-Cherr, 2002). The same outcome was found in a study with second grade students (Parmer, Salisbury-Glennon, Shannon and Struempler, 2009).

To follow-up, the 4th graders were assessed again after 6 months, and the nutrition and garden group maintained knowledge and preference for most vegetables (Morris & Zindenberg-Cherr, 2002). Another similar study conducted with 6th grade children found comparable results, showing that school gardens can positively influence nutrition knowledge and consumption (McAleese & Rankin, 2007; Oxenham & King, 2010). In addition, longitudinal studies have been suggested to assess the long-term impacts of gardening in early childhood into the adult hood (Blair, 2009; Oxenham & King, 2010).

To examine the potential relationships between the community and nutrition, a study of 6th grade students, 67% of whom received free or reduced lunch was conducted (Ratcliffe, Merrigan, Rogers, & Goldberg, 2009). After 13 weeks of learning about garden related topics like science and nutrition, as well as planning, implementing, and caring for a garden, the students showed increased knowledge of vegetables. Students who actively participated in all 13 weeks also showed an increased interest in vegetables and were more likely to taste new vegetables, as well as request those they had grown to enjoy (Ratcliffe, Merrigan, Rogers, & Goldberg, 2009). It is important to consider the time span examined in this study. Time constraints can be an issue in schools, but it is possible to create change and invigorate children's interest in something they directly affect (Ratcliffe, Merrigan, Rogers, & Goldberg, 2009).

As part of a three part holistic approach to addressing children's health in schools, a pilot study was conducted to see how to implement a program that uses farming, food, and fitness to increase awareness of children in kindergarten, 4th and

5th grade (Heneman, Junge, Schneider, & Zidenberg-Cherr, 2008). The food aspect of the study involved creating a garden where the children could directly explore the link between food and nutrition (Heneman, Junge, Schneider, & Zidenberg-Cherr, 2008). With help from California Cooperative Extension and other community members, curriculum and extracurricular activities were created to invite family and community members to participate in aspects of the program (Heneman, Junge, Schneider, & Zidenberg-Cherr, 2008).

At the conclusion of the study, the parent surveys that assessed child nutrition provided information about the increased consumption of vegetables, decreased consumption of soft drinks, and a decrease in computer usage (Heneman, Junge, Schneider, & Zidenberg-Cherr, 2008). The post-test regarding plant knowledge showed increases in correct responses about parts of plants, plant nutrition, and an awareness of how to prepare more nutritious meals (Heneman, Junge, Schneider, & Zidenberg-Cherr, 2008). This study shows the importance of a collective effort to plan, implement, and sustain a program that addresses wellness using a holistic model. The researchers determined that although the program was effective, it would be difficult to sustain it without support or monetary support (Heneman, Junge, Schneider, & Zidenberg-Cherr, 2008).

As an example of how support at home can influence the effectiveness of garden-based programs, a pilot intervention study in a summer camp was conducted, where fourth to sixth grade students participated in weekly garden activities, as well as in-class activities such as taste tests and cooking activities (Heim, Stang, & Ireland, 2009). The purpose of the study was to increase knowledge

of fruit and vegetables, as well as increased preferences for both at school and home. To continue discussions, family newsletters were sent home. At the end of the 12-week period, the children's knowledge of fruit and vegetables had increased and they began asking for them at school and home. In addition, the garden activities appeared to have influenced the children's connection from "seed to table" (Heim, Stang, & Ireland, 2009, p. 1220), making them more aware of the origination of food.

If children are given the opportunity to experience garden-based learning, it is possible to increase their awareness of nutrition, especially as it relates to food that they are directly involved in cultivating and harvesting (Heneman, Junge, Schneider, & Zidenberg-Cherr, 2008; Oxenham & King, 2010). Because of possible restrictions due to standardized education, as well as government nutrition programs, it is important to consider how the integration of garden-based programs occur (Finkelstein, Hill, & Whitaker, 2008; Oxenham & King, 2010). Family involvement in school gardens is also important to understand to follow the connections that children make regarding nutrition from home to school (Heim, Stang, & Ireland, 2009). While children are learning about nutrition in the garden, they are also developing awareness and understanding of where food comes from, as well as the many ecological systems involved in making it possible to grow food. In this way, they are becoming literate individuals about their environment, also called ecological literacy (Cutter-Mackenzie & Smith, 2003).

Ecological Literacy. The overall topic of ecological literacy encompasses all aspects of the learning process, particularly about how people interpret and live in their worlds (Edwards & Cutter-Mackenzie, 2006; Subramanium, 2002). Literacy

has many definitions, most commonly referred to as the ability to read and write, but it is also about meaning making and awareness of the world around you (Nieto, 2002). Edwards and Cutter-Mackenzie (2006) describe eco-literacy as a way "to appropriately encapsulate (*measure)* both ecological literacy (complex knowledge) and environmental (*eco)* philosophy (belief) indicators" (p. 502).

Ecological, or environmental literacy, promotes the idea that children gain awareness of the world around them in ways that facilitate their literacy development. This encompasses how they translate what they learn into their reading, writing, and social interactions, as well as how the directly engage and interact with the world (Edwards & Cutter-Mackenzie, 2006; Lo, Affolter, & Reeves, 2002; Whitehurst & Lonigan, 1998). Specific to ecological literacy is the idea that children are exposed to nature and to ways of living in the world that address topics including gardening and environmental awareness (Edwards & Cutter-Mackenzie, 2006; Orr, 1992; Peloso, 2007). To further the idea, Berkowitz, Ford, and Brewer (2005) suggested using the term environmental citizenry to address the issue of literate citizens acting in ways to improve the world.

To assess characteristics present in ecological literacy, Skelly and Bradley (2007) conducted a study about the Florida School Garden Competition. Both 3rd grade teachers and students participated in the study that aimed to measure attitudes concerning the environment and science concepts using a Likert-type scale (Skelly & Bradley, 2007). In the schools, both vegetable and flower gardens were constructed for the children. Following analyses, the authors found that all children showed a high degree of responsibility in maintaining both gardens, but they

showed more interest in the vegetable garden, although the attitudes towards science were lowest in the vegetable garden (Skelly & Bradley, 2007). These findings suggest that children are interested in gardening and become invested in maintaining it once they begin to see results in the garden and can hold something tangible. Because the scores were high on responsibility, the authors suggested that teachers continue to integrate issues related to eco-literacy into the curriculum (Clarke, 2002; Skelly & Bradely, 2007; Subramanium, 2002). The teachers in this study primarily used the garden only for environmental education, which could be related to the high scores, but the gardens could be used to further other science attitudes that were lacking in the study (Skelly & Bradley, 2007).

In another study that explored aspects of eco-literacy, 10 to 14-year-olds participated in a 6 week gardening camp (Libman, 2007). Through interviews and focus groups, the children discussed how much they had learned over the time. It was also observed that the children began to consume vegetables in their raw form, versus requesting sauces and dips when they first arrived at camp (Libman, 2007). In addition, although the children discussed how hard it was to work in the garden, they all appreciated the effort that others take to ensure they have food to eat, gaining an awareness of the time, materials, and other resources required to sustain a garden (Libman, 2007).

These studies demonstrate how ecological literacy develops as children are exposed to garden-based learning. When children directly participate in the act of gardening, they form relationships with the earth and make connections between what they grow and eat (Libman, 2007). In addition, ecological literacy concerns the

way that children may use the knowledge they have, which has been shown regarding the sense of responsibility that is fostered in them through the gardening experiences (Cutter-Mackenzie & Smith, 2003; Subramanium, 2002). As ecological literacy develops in children, other learning achievements are made as well concerning content areas such as science. In addition, attitudes towards learning can be positively influenced as children learn important life skills associated with ecological literacy (Nimmo & Hallett, 2008; Robinson & Zajicek, 2005).

Learning Achievements & Life Skills. When children experience garden-based learning, there are many opportunities for learning (Blair, 2009). As children collaborate with peers, teachers, and family and community members, they make connections between what is happening in the garden and content areas required in school (Leakies & Sheavly, 2007; Children, 2009). In many cases, the learning that occurs in the garden is engaging and enables real-world experiences to translate to the classroom (Robinson & Zajicek, 2005).

Using the environment in education, such as school gardens or using the schoolyard as a classroom has proven benefits. In a nationwide study by the State Education Department, the Environment for Integrated Context for Learning (EIC) was evaluated. Using quantitative and qualitative research strategies, 40 schools' programs were examined who comprehensive inclusion of environmental concepts were linked to key content areas. In all schools, students were performed better on standardized exams, and had a greater interest in learning, as well as self-esteem about their ability to learn (Lieberman & Hoody, 1998). In schools that understand that "environmental education is not simply a strategy for educating young people

about environmental issues, but rather a system for using the environment as an organizing theme around which other content areas are organized." (Canadian Council, 2009, p. 3), were successful because many possibilities existed to learn. The experiential nature of the learning process allowed for higher order thinking skills and an awareness of their relationship to the earth (Canadian Council, 2009).

In a review of the benefits of gardening, The Children, Youth and Environments Center for Research and Design Center (2009) found that children developed higher learning skills, as well as positive attitudes towards content areas and learning. In one study, third, fourth and fifth grade students involved in gardening reported that they had more self-esteem and competence, as well as feelings of group membership due to the collaborative relationships they formed with their peers in the garden (Robinson & Zajicek, 2005). In an extension of this study, 3rd, 4th, and 5th grade teachers were trained on gardening specific curriculum (Klemmer, Waliczek, & Zajicek, 2005). Then, the students were placed into two groups, one where teachers only used the curriculum and the other where teachers used the curriculum in conjunction with experiences in the garden. Students who had hands-on experiences scored higher on tests that measured their understanding of science concepts and the environment (Klemmer, Waliczek, & Zajicek, 2005). These findings show the importance of providing hands-on experiences in the garden for children to take advantage of the opportunities for knowledge growth in the garden, and the association that hands-on, experiential learning opportunities have on higher order thinking skills (Blair, 2009; White Hutchinson , 2001).

Similar findings related to an increase in test scores were found in a study that looked at the Boston Schoolyard Initiative (Mauricio Gaston, 2008). In this study, an ecological model was used to determine whether the improvements in the schoolyard were related to test scores and physical characteristics, such as weight. The authors looked at 4th grade students and found that although test scores could not be directly associated with experiences in the schoolyard, physical characteristics could. Using public information, they found that activity increased and some children's weight decreased; suggesting that the schoolyard improvements could have facilitated more activity before, during, and after school (Mauricio Gaston, 2008).

In New York, Lekies and Sheavly (2007) studied what activities in the garden influence children's interests in gardening. The 9 and 10-year-olds were already a part of a larger study called Greener Voices, which was a three-year program to enable children and adults to collaborate in the garden (Lekies & Sheavly, 2007). The authors measured the children's garden activities, skills, and interests checklists and surveys. More than half of the children were involved in planting and maintenance tasks, as well as saying they were interested in gardening. Less than half of the children showed significant increases in gardening knowledge, such as plant differentiation (Lekies & Sheavly, 2007). They also found other influences such as health, attitudes about the environment, as well as social skills in regards to discussing their experiences and asking questions of other children and adults (Lekies & Sheavly, 2007).This study shows the different ways that children can be involved in gardening, as well as how interests in gardening may arise out of such

experiences. This study also shows that when children get to participate in hands-on activities, children can gain an awareness of the earth and what it can provide, particularly if they are given ample time in the garden (Coyle, 2010; Lekies & Sheavly, 2007).

In New Hampshire, a child development lab school created a gardening experience for children that enabled them to explore their immediate environment, and in addition, provided an avenue for children to connect directly to their local community (Nimmo & Hallett, 2008). Through a partnership with horticulturists at a local university, farmers, parents, and community members, the child development lab school was part of the "Growing a Green Generation project" (Nimmo & Hallett, 2008, p. 2) that sought to facilitate children's development of an awareness of the possibilities in their community. Infants to kindergartners experienced the garden, and their teachers' piloted curriculum centered on the garden as a learning tool. Focused on place-based instruction, the garden was a place where children could play and "create new worlds that use the sensory elements of the natural environment" (Nimmo & Hallett, 2008, p. 2).

By sharing not only the joy, but learning opportunities that a garden could provide for children and teachers, the project sought to instill excitement in teachers to use similar practices (Nimmo & Hallett, 2008). The authors found that teachers began to be optimistic for children's abilities to not only help in the garden, but also think critically about what they were learning. It was okay that the garden jobs were not exactly like the teachers wanted so risk taking was an important part of the garden, for both teachers and children. The garden was a safe place for

children to explore and for teachers to expand their views of what could be used as instructional tools and allow both spontaneous and planned activities to occur as both teachers and children saw fit (Nimmo & Hallett, 2008). For children, they learned it was okay if they needed help, which they could find due to the partnerships formed in the garden (Nimmo & Hallett, 2008).

An important finding involved the partnerships created as well, as children not only engaged with their teachers as partners, but also family and community members as well who had special expertise in different areas of the garden (Nimmo & Hallett, 2008). As the garden grew, the parents recognized how important their child was in the production. Families often came with their children to harvest produce from the garden to take home for meals (Nimmo & Hallett, 2008). Relationships among the children were also fostered as the 3-year-olds watched the 5 and 7-year-olds build a trellis for beans. As they observed, the 5 and 7-year-olds called them over to show them how to do it, helping them in the process (Nimmo & Hallett, 2008). The experiences that took place in this garden provided opportunities for children, teachers, and family and community members to learn and share with one another to grow vegetables.

The notion of collaborative gardening was also seen in Nebraska, where preschool and kindergarten children experienced an outdoor classroom that included an edible garden, greenhouse, and other interactive structures due to funds provided by The Dimensions Foundation (Miller, 2007). To explore how and what they learned through hands-on activities, teachers were co-researchers with the author and kept observational notes on every child as they interacted in and with

the garden. Parents and organic farmers were identified to provide knowledge for the children as they worked and learned in the garden (Miller, 2007). Through these experiences, the authors and teachers identified that the children shared what they learned about gardening with others and developed knowledge in content areas, such as reading, math, and science (Miller, 2007).

These studies show how hands-on experiences in the garden can influence children's learning, leading to knowledge that will help them be successful in school and in life (Lekies & Sheavly, 2007; Miller, 2007; Subramanium, 2002). In addition, partnerships also facilitated knowledge development in everyone, particularly as children feel comfortable collaborating and sharing their ideas (Nimmo & Hallett, 2008). When learning is organic and experiential, it is developed from children's interest, thereby enabling them to explore and learn in the garden (Blair, 2009).

How Does Learning Occur in the Garden?

In some cases, school gardens are utilized in the classroom from the teacher's perspective, and the activities in the garden can often represent what they know, not what children know or want to discover (Loughland, Reid, & Petocz, 2002). To understand ways that children understand the environment, an interdisciplinary group of stakeholders in environmental education examined children's perceptions of the environment. Children in grades 3 to 8 completed open-ended surveys. The authors found that the perceptions varied depending on grade level, as 3rd graders thought of the environment as place with living things and people, whereas older children discussed the environment in relation to people. In this way, a sense of responsibility for what happens to the environment was expressed (Loughland,

Reid, & Petocz, 2002). These findings show that perceptions of the environment are dependent upon children's experiences within it. To make experiences in the garden meaningful, it is important to let the children choose their path, enabling them to create their own experiences based on their perceptions instead of teachers leading down a path they not understand (Loughland, Reid, & Petocz, 2002).

When looking at school garden experiences for children then, it is important to understand how children view the experience; what are their perceptions of the garden (Hyun, 2005). Initially, gardens stimulate the senses, enabling children to explore experientially and perceive things in new, fresh ways (Clarke, 2002; Hyun, 2005; Kahn, 2009). In a qualitative inquiry to understand how children's perceptions of gardens differed from adults, Hyun (2005) found that children were much more expressive in the discourses they used. Adults often responded to experiences with basic observations, but children provided thoughtful, elaborated, and complex descriptions of what they saw and perceived (Hyun, 2005). For children, implications of this study include the importance of allowing them to have hands-on experiences that enable them to receive and react to stimuli in the environment with interacting in and with it.

Experiential Learning.

> I take it that the fundamental unity of the newer philosophy is found in the idea that there is an intimate and necessary relation between the processes of actual experience and education. (Dewey, 1938; 1998, p. 7)

In the first years of a child's life, experiences are the foundation of their development (Dewey, 1938; 1998). For children to have experiences that are

meaningful and relevant to their lives, it is important to listen to their cues and acknowledge their perceptions of the world (Hyun, 2005, Coyle, 2010). By listening and observing their actions, interactions, and reactions, teachers can better understand the needs of individual students. Therefore, providing learning experiences that are interest-based and apply to their lives facilitates connections to the world beyond the classroom and enables them to *experience* outdoor spaces (Subramanium, 2002).

Experiential learning is used to facilitate deeper level learning, as well as higher order thinking skills by considering each developmental domain and allow learning to occur as an organic process (Laevers, 2000). This type of learning is not content based, but context based because students are expected to make connections in and between contexts they experience (Blair, 2009). Students work within an open framework of ideas and are allowed to explore ways of thinking and doing (Laevers, 2000). Students are encouraged to apply their knowledge in new and different ways. As part of an experience-based classroom, interest should play a role (Renzulli, 1978). Students should have control over what they learn, as well as how they learn it (Hyun, 2005). This way, the students create their own experience while learning, engaging more directly in the experience and deepening their critical thinking skills.

Because standards are an integral part of most curricula, it is important to consider the impacts that school gardens have on them. In a study of classroom-based instruction versus hands-on, garden-based instruction, researchers found that students made and maintained lasting connections between vegetable

knowledge and nutrition when teachers used garden-based instruction in conjunction with standards curriculum (Graham & Zidenberg-Cherr, 2005). This study presents a need to ensure that teachers are receiving education and given resources to help them implementing school gardens that do align with standards in education (Joshi, Azuma, & Feenstra, 2008).

As another way to incorporate *experiences* into schools and curriculum, Joseph Renzulli (1978) suggested the use of enrichment clusters. The idea is that students' learning opportunities are enriched through meaningful instruction that is based on their interests, allowing them to engage in higher order thinking (Renzulli, 1978; Renzulli & Reis, 2008). Increasingly, schools are turning to enrichment clusters as way to navigate through standards-based methods by providing children experiences where they can flex their creativity (Renzulli, Gentry, & Reis, 2004).

Through school-wide enrichment models (SEM) that use enrichment clusters, "everyone has an important role to pay in societal improvement and everyone's role can be enhanced if educators provide all students with opportunities, resources, and encouragement to aspire to the highest level of talent development" (Renzulli & Reis, 1997, p. 1). In this way, children can become experts in something they are interested in, which can facilitate a greater investment in their learning (Renzulli & Reis, 1994; Wake, 2007). As enrichment models are implemented in schools, there is also an opportunity to develop curricula that are interdisciplinary to account for the many interests that children have, ensuring that the experiences they have are relevant, meaningful, and enriching (Renzulli & Reis,

1994). When this curriculum is in place, children actively learn, not only by listening, but also by doing as they learn collectively (Renzulli, 1978).

During enrichment clusters, teachers and collaborators act as guides in the classroom, allowing children to take the lead (Renzulli & Reis, 2008). Children learn naturally as they interact with each other identify, brainstorm, and solve a problem (Renzulli & Reis, 2008). The interactive nature of an enrichment cluster is crucial to maintain to encourage dialogue amongst children, teachers, and other contributors in the classroom (Renzulli & Reis, 2008). It is also possible to reverse the children's role in the classroom by empowering them to create change, acting not as learners, but as teachers and advocates (Renzulli, Gentry, & Reis, 2004).

School-wide enrichment models have been utilized and studied in many schools around the world and have been successful (Renzulli & Reis, 2008). In one school, the enrichment model was implemented to close an achievement gap in the wake of No Child Left Behind (Beecher & Sweeny, 2008; No Child, 2001). As administrators and teachers collected data, they realized that the "expansiveness of the enrichment initiatives extended students' knowledge, thinking, and view of the world" (Beecher & Sweeny, 2008, p. 527). By using similar methods in the classroom or schoolyard, children can gain an awareness of their world directly, through hands-on, experience, and interest-based learning methods (Blair, 2009).

In some cases, it may be difficult for teachers to facilitate experiential learning because the outcome is unscripted (Torkington, 1996). However, the most important aspect of experiential learning is that is constant and that it provides an outlet for "observations and reflections" (Subramanium, 2002, p. 3) to occur. The

practice should be integrated into classrooms, not sporadically utilized (Subramanium, 2002; Torkington, 1996). Most educational opportunities however are geared towards older children and adults (Lo, Affolter, & Reeves, 2002). Some environmental advocates are providing environmental education opportunities in early childhood that allow children to grow not only in the knowledge that they gain, but also developmentally while working in a garden growing food (Feinsinger, Margutti, Oviedo, 1997; Nimmo & Hallett, 2008). School gardens facilitate experiential learning because they provide a rich, natural learning environment where "teachers and students may encounter a ready-made laboratory available daily at no extra charge, stocked with a diverse array of plants…and human impacts that can be touched, measured, compared, and manipulated" (Feinsinger, Margutti, & Oviedo, 1997, p. 116).

In a study that evaluated 15 farm to school programs, areas related to learning opportunities were identified (Joshi, Azuma, & Feenstra, 2008). They included nutrition of students and families, as well as participation by teachers and family in school meals. In addition, behavioral changes of students were explored. In programs where all of the aforementioned effects were seen, a combination of education and hands-on instruction related to food was utilized (Joshi, Azuma, & Feenstra, 2008). In those classrooms, students were better able to understand concepts like seasonality and regionality of foods (Joshi, Azuma, & Feenstra, 2008).

In a qualitative study of 8 to 10-year-olds, Malone & Tranter (2003) used interviews with teachers and children, observations, and children's artwork to discover how children's daily experiences on their playgrounds affected their

knowledge of the environment. The authors discovered that the playground set-up affected how the children engaged with the outside world, and that the most environmental learning occurred when children were able to make connections between what they learned inside the walls of the school and outside on the playground (Malone & Tranter, 2003). This was important because many of the children did not have access to green spaces outside of the school, so the outside time and space provided by the school represented the children's opportunities to experience nature (Coyle, 2010). The findings suggest that children are more likely to learn about the environment from direct experiences they encountered in the playground, not from books they read about environmental encounters (Malone & Tranter, 2003; Subramanium, 2002). Understanding the limited access that low-income families might have to green spaces, it is increasingly important to provide children with opportunities to experience nature (Sallis & Glanz, 2006).

Another factor to consider is curriculum. When it relates directly to experiences the students have daily, instruction becomes integrated into the context of their lives (Subramanium, 2002). Lieberman and Hoody (1998) found that when this occurs, students learning outcomes are positive. A national study by the State Environmental Education Roundtable found that students were more engagement and retained reading and math using experiential learning (Lieberman & Hoody, 1998). Most profoundly, students demonstrated critical thinking skills as they observed, collected data, and asked questions about what they identified. This is in part due to increased student-teacher interactions because teachers were more

engaged in what they were teaching and therefore constructed an environment for learning that was positive for students (Lieberman & Hoody, 1998).

Children are innately curious beings, so using experience-based education works because they are not confined to one way of thinking, but instead can practice at thinking for themselves, learning about who they are in the process, as well as how they learn best (Laevers, 2000). In thinking openly, students think critically and learn how to organize thoughts and ideas (Coyle, 2010; Laevers, 2000). As a process-oriented method, experiential techniques focus on how students learn, not what the product will be at the end (Cutter-Mackenzie, 2009; Laevers, 2000). To understand the process of learning experientially, it is important to understand the context of the environment where learning occurs (Blair, 2009). Exploring the method of using children's interests in learning may help to explain not only how children are motivated to learn, but how they learn as well (Nimmo & Hallett, 2008).

Implementation Challenges

It takes money to establish a school garden, and other funds are required to maintain it. In some situations, schools create gardens and in others, teachers do. When teachers take on the responsibility of establishing, maintaining, and sustaining a garden, it can be stressful and isolating (Oxenham & King, 2010; Ozer, 2007). In addition, gardens take time. With the many responsibilities inside the school that educators have, the time required outdoors increases, which can also be challenging (Ozer, 2007). Having a collaborative team of garden planners and workers has shown that success is possible (Heneman, Junge, Schneider, & Zidenberg-Cherr, 2008; Ozer, 2007). When educators, nutritionists, agricultural

professionals, and other professional and community members share responsibility, the possibilities are endless (Blair, 2009; Oxenham & King, 2010; Subramanium, 2002). In many cases, the collaborative nature provides indirect and direct resources to the garden effort, particularly in terms of labor and funds, which are increasingly becoming available through local, state, and federal programs (Oxenham & King, 2010).

Another challenge teachers face in implementing school gardens concerns making the experience relevant for their students (Blair, 2009). Often, even opportunities in the schoolyard must adhere to standards, leading teachers to align their teaching with what is required (Robinson-O'Brien, Story, & Heim, 2009; Ross & Frey, 2002; Wake, 2007). This can result in learning activities that are less open-ended and leave less opportunity for them to explore the garden freely, in ways that relate to their lives (Wake, 2007). It is important for teachers to find a balance between requirements and following the children's lead, letting them determine how they need and want to use the space (Blair, 2009; Wake, 2007).

In the case of the Kansas elementary school garden, the parent and community advocates led to a garden, but it was unused for six months because teachers were unprepared to use it as an instructional tool (Kingery-Page, Hunt, & Teener, 2010). Although community members and university faculty contacted teachers to organize a training session to orient them on how they might use the garden, nothing was organized. As winter approached, the garden remained unused by students or teachers at the school. So, when the school board met to discuss opportunities for expansion, the decision to remove the garden was made. Although

there are plans to re-install the garden in a different area of the schoolyard, all money that was raised externally was lost, making it challenging to re-create the garden (Kingery-Page, Hunt, & Teener, 2010). An implication of this garden's story is that it is imperative to establish relationships with teachers who will use the garden at school. Although parent and community involvement and interest are important, the buy-in from the school is necessary for success (Kingery-Page, Hunt, & Teener, 2010). Teachers must be approached to have a hand in the garden planning process so that it meets everyone's needs. Additionally, teachers should be asked about their expectations and desires to make the garden sustainable in a school environment (Kingery-Page, Hunt, & Teener, 2010).

In some cases, educators do not have the agricultural background or knowledge to begin incorporating school gardens and instruction (Berkowitz, Ford, & Brewer, 2005; Trexler, Johnson, & Heinze, 2000). Therefore, as the number of gardens across the nation increases, it is important to consider the background knowledge that teachers do or do not have (Berkowitz, Ford, & Brewer, 2005). One study found that this was true when focus groups were conducted with 2nd to 8th grade teachers in Michigan (Trexler, Johnson, & Heinze, 2000). When asked, they said they had very little knowledge of where food comes from, but they desired to incorporate agriculture into the environment to address health and wellness concepts. They thought that partnerships with farmers and community members would be helpful and that family involvement might make more of an impact nutritionally. However, most teachers noted that they did not think that families had knowledge about how to make healthy food choices at home (Trexler, Johnson, & Heinze, 2000).

However, when gardens are used for science instruction, science teachers have an understanding of the specific aspects they are teaching (Blair, 2009). However, when gardens are used as a holistic tool in curricula, teachers may not have a background in agriculture or environmental issues (Berkowitz, Ford, & Brewer, 2005). Elementary school teachers were surveyed about their experiences with science and reported that they were hesitant to use a garden for instructional purposes because they did not feel comfortable teaching the subject and because the schoolyard was not appropriate for formal lessons (Berkowitz, Ford, & Brewer, 2005). In another study, primary grade teachers were interviewed and a majority said they had never received formal education concerning environmental topics (Cutter-Mckenzie & Smith, 2003). Teachers with limited ecological or agricultural knowledge have said that they would be open to using gardens as instructional tools if professionals in their community partnered with them to offer meaningful encounters in the garden (Berkowitz, Ford, & Brewer, 2005; Blair, 2009). In addition, teachers wanted intellectual and tangible resources to help implement and sustain gardening efforts, as well as a member committed to being in the classroom, or in the schoolyard (Berkowitz, Ford, & Brewer, 2005).

One way to combat the challenges that teachers face is to locate the funds of knowledge that exist both in and beyond the school environment (González, Moll, & Amanti, 2005). Funds of knowledge welcome and encourage the contributions of students and teachers, but of family and community members as well to provide an educational environment for children that directly relates to their world. In honoring the knowledge of others, everyone becomes a learner and the possibility

for partnerships through experience, interest-based gardening are promising (Nimmo & Hallett, 2008). It is important to understand how family and community funds of knowledge can provide beneficial and relevant contributions to school gardens.

Family and Community Partnerships

As young children make meaningful connections while they experience vegetable gardening, they communicate their excitement and knowledge to their families (Ozer, 2007). In previous studies, families have been involved in gardens through various modes of engagement whether they are involved indirectly by providing materials and funding or directly by physically coming to the school and working or sharing knowledge (Nimmo & Hallett, 2008). Through family involvement in school, educators recognize families as partners in their children's education, constructing a classroom where families may be more likely to be involved (Epstein, 1995). As involvement occurs, children perceive the positive relationships between school and their families and are more eager to learn, and to share their knowledge with them as well (Ozer, 2007; Vopat, 1994).

In this way, children perceive the investment that their families have and commit themselves further to their learning (Subramanium, 2002). For this model to be successful elsewhere, it is important that both schools and teachers create welcoming environments (Davis & Yang, 2005). Through the environment and teacher practices, parents "trust that the teacher knows and appreciates their child, they're much more likely to work collaboratively to support the child's education"

(Davis & Yang, 2005, p. 75). As collaboration occurs, children are also more likely to flourish in the classroom (Davis & Yang, 2005).

In a longitudinal study over a 2-year period, families were involved at home to examine changes related to nutrition (Hoffman, Franko, Thompson, Power, & Stallings, 2009). Children in four different public schools in kindergarten and first grade were placed into an experimental group that looked at their fruit and vegetable preferences, while monitoring their intake at lunch and collecting physical information, such as body mass index, height, and weight. These measures were already being taken due to the children's participation in a larger study. A reward system was implemented to provide stickers when children ate fruit and vegetables at lunch. In this study, families were involved as well. Each participating family was given interactive books to read at home. The books included cookbooks, both professionally published, as well as one written by teachers and students (Hoffman, Franko, Thompson, Power, & Stallings, 2009). By providing the family's homework, the researchers sought to provide a connection from school to the home and facilitate an opportunity for the children and families to communicate about the importance of nutrition. At the end of both year 1 and 2, the children who were in the group that included the reward system and family participation had more intake of fruits and vegetables than children who did not (Hoffman, Franko, Thompson, Power, & Stallings, 2009). This study provides findings to support that family involvement does impact the way information in education is used (Blair, 2009). The connection created from activities in school to home provided consistency across environments. By experiencing educational materials in both environments,

children not only increase the time spent on the subject, but they see how the information fits into their everyday lives (Subramanium, 2002).

To make the garden an experience that was culturally responsive, families in Oklahoma were directly involved in constructing and using plant materials to demonstrate traditional crafts from their heritage (Robinson-O'Brien, Story, & Heim, 2009). In that study, 3rd to 8th grade students constructed a traditional Native American garden as part of an after-school program to try to increase students' vegetable consumption (Robinson-O'Brien, Story, & Heim, 2009). During the course of the garden implementation, the students families assisted in maintaining and cultivating it, which was a noted strength mentioned by the authors (Robinson-O'Brien, Story, & Heim, 2009). In addition to involving parents at school, it is also possible to include them while at home, allowing learning and participation to occur in an environment that is relevant to each family (Heim, Stang, & Ireland, 2009).

In the Heim, Stang, and Ireland (2009) study, a key component was to involve the parents at home in changing eating habits by sending home newsletters with information about gardening and nutrition. Although parents did not directly participate in garden activities at home, they did complete activities with their children (Heim, Stang, & Ireland, 2009). Through the weekly newsletters families were encouraged to try new recipes with food from the garden. As the garden progressed, children brought vegetables from the garden home to share. The change in diet was associated with parental support, as well as the families' access to fresh fruits and vegetables on a regular basis (Heim, Stang, & Ireland, 2009). Through parent surveys, it was also reported that children make most of the food decisions in

the home; therefore an implication of this study concerns the impact that children's knowledge of the origins of food has on the types of food they request to eat at home (Heim, Stang, & Ireland, 2009).

Although addressed, the understanding of parent participation in farm to school and garden programs is limited. In an evaluation conducted by Joshi, Azuma, and Feenstra (2008), some programs did see a positive shift in support for families who were involved in educational components of instruction. In addition, parents reported altering their diet and grocery demands based on their child's participation, as well as their own (Joshi, Azuma, & Feenstra, 2008).

In Kansas, family and community were directly involved because parent advocates and community members pushed for the installation of a garden at their children's elementary school (Kingery-Page, Hunt, & Teener, 2010). As the authors document, the grassroots effort led to a garden installation with the help of university landscape architects and hours laboring in the school yard. Children worked on garden plans with architects and decided what plants to cultivate while learning about gardens in the classroom (Kingery-Page, Hunt, & Teener, 2010).

However, due to school expansion, the garden was removed entirely, covered by bricks and mortar (Kingery-Page, Hunt, & Teener, 2010). In this garden, the efforts to provide a green space for students to explore were cut short, only in place for six months before the garden was removed entirely and replaced with bricks and mortar. The advocates for the garden remain waiting for the re-installation to occur, fighting against a system that is less convinced of their efforts (Kingery-Page, Hunt, & Teener, 2010). That fact provides justification again for the buy-in and investment

that is necessary for school administrators to have if school gardens are going to be successful (Blair, 2009).

One component that also helps to create a sustainable, working garden is to form relationships with community members who have access to resources, both intellectual and tangible, that can help in the garden. Accessing the funds of knowledge that exist is important to ground the garden and any educational components in relevant places because families and community members are intellectual sources (González, Moll, & Amanti, 2005; Nimmo & Hallett, 2008). In this way, students learn about their community. Place-based initiatives can facilitate learning that is connected to a specific context and understand "the multitude of relationships that exist within the garden, both human and non-human and observe the ways in which these relationships are taught and learnt" (Green, 2007, p. 2). The observed relationships can be used to inform the curriculum used in schools to ensure that is relevant and meaningful for children's lives not only in school, but in their community as well (Blair, 2009; Green, 2007). Place-based initiatives also cultivate the idea of encouraging children to be stewards of the earth and social citizens who recognize and understand the plight of the environment (Cutter-Mackenzie & Smith, 2003; Peloso, 2007).

To introduce teachers to professionals, a series of ecological workshops can occur to orient teachers and professionals on school gardens specifically (Robinson & Zajicek, 2005). To provide further assistance to teachers, Feinsinger, Margutti, and Oviedo (1997) proposed that an inquiry model be used to engage teachers in ecological issues, thereby providing them with the background knowledge to take

advantage of a garden. In the Robinson and Zajicek (2005) study of 3rd, 4th, 5th grade students, the teachers were trained on agricultural and environmental topics that were then integrated into existing curriculum that was required in their schools. As teachers worked side-by-side with professionals who had background knowledge in the content area, they recognized that they are just as capable of doing the same things, instilling confidence in their abilities to teach it to their students (Feinsinger, Margutti, & Oviedo, 1997). According to the positive results regarding the students' self-esteem, it could be that the teachers modeled similar attitudes, modeling their own confidence for the students (Robinson & Zajicek, 2005). By providing experiences that require active inquiry on the teacher and professionals' parts, the workshops facilitate relationships that can be taken back to the schools (Feinsinger, Margutti, & Oviedo, 1997).

To understand how relationships can foster learning in the garden, Mayer-Smith, Bartosh, and Petarat (2007) studied a group of 5th, 6th and 7th grade students as they traveled to farms and worked with retired farmers. The students and farmers worked to plant, cultivate, harvest, and enjoy vegetables in the garden. Both farmers and students collected data and kept journals of the experience (Mayer-Smith, Bartosh, & Petarat, 2007). At the conclusion of the study, the students said that the relationship with the farmers enabled them to learn about gardening, as well as feel confident about their ability to do so. In addition, their journals documented growth in understanding their own relationship to the earth and the impact they have on it. Due to that growth, many students reported that they had a felt a responsibility to care for the earth (Mayer-Smith, Bartosh, & Petarat, 2007). In

addition, the farmers reported that they had a renewed sense of the earth as well; viewing the experience from the children's perspective gave them a fresh look at the implications for cultivating the earth (Mayer-Smith, Bartosh, & Petarat, 2007). This is important to consider because children often have an innocent view of the world, not yet muddled by their experiences (Cutter-Mackenzie, 2009). If researchers and educators can utilize children's perspectives more often, they might understand the significance of gardening experiences (Cutter-Mackenzie, 2009).

In Australia, the multicultural garden program was created to provide needed resources to elementary schools with little access, and usually in disadvantaged areas (Cutter-Mackenzie, 2009). To establish a garden that would be sustainable, a buddy system was implemented, requiring each student to collaborate with a family or community member. The intention behind the method was to create partnerships where buddies could not only learn from each other, but also provide support and instill responsibility for working in the garden (Cutter-Mackenzie, 2009). As part of the research project, children were researchers. They took photographs and recorded observations, thoughts, and experiences in journals as a way to view the garden from their eyes, not interpretations made by adults of their experience (Cutter-Mackenzie, 2009). Through the partnerships, information was shared by family and community members that provided enriching experiences in the garden, accessing funds of knowledge (Cutter-Mackenzie, 2009; González, Moll, & Amanti, 2005). This study shows the importance of understanding children's experiences through children's eyes, as well as the rich experiences that can stem from involving family and community members in the process.

In Wisconsin, a farm to school program relies on the relationships with farmers in the community so that children can see what farmers do to grow food (Kloppenburg, Wubben, & Grunes, 2008). To ensure consistency, each school in the district is paired with a farmer who invites the children to the farm (Kloppenburg, Wubben, & Grunes, 2008). Due to the relationships formed, the farmers also distribute their produce into the schools directly, increasing the access that the students have to fresh, locally grown produce (Kloppenburg, Wubben, & Grunes, 2008). The connection from farm to table is also an important aspect of school gardens that can occur through farm to school programs, which can provide an outlet for farmers and children to connect to the local environment (Blair, 2009).

Farm to School Implications

The idea of farm to school extends beyond the scope of this study. However, school gardens have been used as starting points for such programs, so it warrants discussion (The National Farm, 2004). Generally, farm to school is defined as a program that schools and farmers use to connect, enabling the farmer to distribute fresh produce in local schools (Joshi, Azuma, & Feenstra, 2008). As the number of farm to school programs increases, from 10 in the late 90's to over 1000 in 2007, the effectiveness should be evaluated (Joshi, Azuma, & Feenstra, 2008).

The National Farm to School Program (The National Farm, 2004) performed case studies of schools across the nation to assess the performance and outlook of programs already in place. In cases where limited resources are available, using the school garden as a teaching tool enabled the school, students, teachers, family, and community members to become invested in the food they eat. This investment

provided the groundwork for establishing active, supported, and successful farm to school programs (The National Farm, 2004). The success was attributed to the many stakeholders involved in the project, including parent organizations, farmers, nutritionists, and other professionals in the community (The National Farm, 2004).

In Iowa, a simple question was asked of the students, "do you know where you food comes from" (The National Farm, 2004, p. 16). After a program was implemented to address awareness of local produce, the students and their families and community members worked to provide locally produced goods in schools. Through relationships with food service directors, a few of the schools in the district began purchasing fresh food from local farmers (The National Farm, 2004).

Although success is possible, the challenges for farm to school programs are great (The National Farm, 2004). In the evaluation of a program in New Jersey, the establishment of relationships with agricultural and food purveyors was difficult due to time constraints, finances, seasonality, and distribution (The National Farm, 2004). Time constraints become problematic when the food coming through the school cafeteria is fresh, instead of processed. Additionally, issues concerning distribution occurred because smaller food purveyors have limited supplies compared to larger, public businesses (The National Farm, 2004). Another challenge was seasonality due to the shortage and lack of variety of vegetables and fruits grown during the school year (The National Farm, 2004). Although this was a challenge identified in the New Jersey evaluation, this is the case in most areas of the United States (Joshi, Azuma, & Feenstra, 2008).

Other issues concerning farm to school programs involve the restrictions placed on school systems by the federal government. The United States Department of Agriculture (USDA) oversees the Commodity Supplemental Food Distribution Program, in which it "purchases surplus domestic commodities and supplies them, in turn, to federally-funded feeding programs throughout the country" (The National Farm, 2004, p. 6). As a result, schools who have students participating in the National School Lunch Program receive meat and dairy products, as well as other shelf-stable items. Although the implementation of this program is meant to provide schools food at a reduced cost, as well as subsidize it for the producers, the quality is often low and not fresh (The National Farm, 2004).

In addition, the USDA places strict guidelines on schools, ensuring that all products served in schools meets federal standards (Joshi, Azuma, & Feenstra, 2008). Unfortunately, the standards often mean that the food children are served is highly processed and not nutritionally dense (The National Farm, 2004). There have been attempts to introduce higher quality, fresh produce into schools through federally funded grants. During the grant funding period, schools are given minimally processed (in some cases highly) fruits and vegetables to serve during snack time, only addressing certain parts of the day instead of lunch time, where more restrictions are still in place (USDA, 2003). The USDA currently administers the Department of Defense (DOD) Fresh Program in 12 states across the nation. This program encourages schools to buy from local food producers. However, relationships between all participating local, state, and federal agencies are required and the negotiation of relationships is difficult (The National Farm, 2006).

Although the USDA restrictions can be seen as a challenge, the administration is trying to improve its image by providing more funding opportunities for schools (USDA, 2010b). Tom Vilsack, the Secretary of Agriculture has launched a website and campaign called, *Know Your Farmer, Know Your Food*, in which he is advocating for local farmers and rural communities to be recognized and utilized (USDA, 2010a). Although not directly linked to school nutrition, the campaign is a start and provides the groundwork for extending awareness into school communities.

An implication of farm to school programs is the fact that 31 million children across the nation participate in the National School Lunch Program, some of whom received free or reduced lunches (Food & Nutrition Service, 2010a). In addition, another 11 million participate in the National School Breakfast Program (Food & Nutrition Service, 2010b) If farm to school programs are put into place, the access of more nutritionally dense foods are made possible and more children benefit (The National Farm, 2004).

Further, nutritional implications of farm to school programs include decreases in obesity rates, as well as other diet related illnesses (The National Farm, 2004; Joshi, Azuma, & Feenstra, 2008). As Michelle Obama's *Let's Move* campaign gains ground, healthy food initiatives are being introduced, including salad bars in schools and calling for parents and administrators to take charge in providing children with an education about the importance of nutrition (Let's Move, n.d.). Because most children eat more than half of the daily calorie allotment at school (Let's Move, n.d.), it is imperative to address the quality of food consumed in schools (Joshi, Azuma, & Feenstra, 2008).

In New Mexico, the *Cooking with Kids* program has seen great success by providing students with hands-on experiences with food (The National Farm, 2004). Because of federally mandated guidelines, a Santé Fe School District began their experiential program in 1996 and it has evolved to continue meeting the needs of its students. Currently, the program follows all guidelines related to standards in education (The National Farm, 2004). Through the evaluation of the program, the true success was attributed to the many individuals and groups working together for a common goal. School administrators, nutritionist experts, and community members realized that providing fresh, local produce was going to be difficult, but continued to persevere in the face of adversity, continuing to challenge the status quo and fight for what they believe (The National Farm, 2004). Their resolve led to changes in the state legislature to allow local farms to provide fresh produce for the school. This benefits the program by establishing and maintaining relationships with others who can provide the assistance and tools to ensure the program remains active and successful for students (The National Farm, 2004).

The network of people is fundamental in beginning and sustaining farm to school programs, which was also found in the *Food for People Program* in California (The National Farm, 2004). In their program, relationships with university extension agents and state public health employees made it a reality (The National Farm, 2004). An identified feature of relationships that was found in the California farm to school program was getting buy-in from the stakeholders, such as school board members and administrators (The National Farm, 2006). When information is just given to individuals, little progress is often made. However, if dialogue occurs,

then the stakeholders actually invest in the idea because their ideas and contributions are not only asked for, but also acknowledged and used to co-construct plans (Joshi, Azuma, & Feenstra, 2008). In addition, they also found that it was important to ensure that education was occurring in the classroom, so that children were reconnected to the earth to get the foundational knowledge of food growth to make connections to food production (The National Farm, 2004).

In perhaps one of the most successful farm to school programs, the members of the community addressed their needs by using a holistic model (The National Farm, 2004). Educational components in the classroom were based on standards, the cafeteria personnel were included in the education, and the community was involved by reconnecting them to the origin of food. The Vermont Food Education Every Day (VFEED) Program was also successful because many levels were affected; addressing the sustainability of such programs by ensuring that food awareness was embedded in the culture of the school and community (The National Farm, 2004). Any curriculum was integrated, not added on to teachers' loads, making the learning process meaningful and less stressful (The National Farm, 2004). In the curriculum implantation, the students were encouraged to explore their interests. This led to varying levels of education in each grade level, addressing dirt composition to harvesting to the history of farming in America (The National Farm, 2004).

Similarly, the little success that one program had was due to the lack of integration and education surrounding it (The National Farm, 2004). Although fresh, local produce was brought into the school, little to no connection was made in the school by students or administrators because education did not occur. In later years

of the program in Yolo County California, decisions were made to integrate educational opportunities into existing curricula as well as engage families and community members in the process (The National Farm, 2004). In Colorado, a program implemented a community-wide public relations campaign to engage the community and provide awareness of why the farm to school program was being implemented (Colorado, 2010). Through events like movie nights, dialogue between community members began and ignited interest in ensuring success for the program (Colorado, 2010).

Because of the increasing popularity and success of farm to school programs, the federal government is creating more opportunities for funding related to school gardens and farm to school programs (USDA, 2010b). The People's Garden Grant is a 1 million dollar grant that will fund learning opportunities in schools in a multi-state region. Among the potential benefits to the program are increases in environmental awareness and nutrition, which is ultimately aimed at decreasing rates of obesity (USDA, 2010b). Interesting to note is the fact that family and community members are *allowable*. This specification is not explicated and any other mention only includes the idea of partnerships with professionals (USDA, 2010b). The USDA has also produced resource materials for teachers to use at all grade levels, from pre-kindergarten through high school, such as *Grow it, Try it, Like it.* Through resources like this, teachers can introduce fruits and vegetables with hands-on activities that lead to the garden and through the process of growing food to eat (USDA, 2010c).

The implications of farm to school for school gardens are important to consider because some of the triumphs and challenges are the same (Joshi, Azuma,

& Feenstra, 2008). In addition, successful farm to school programs relied on relationships and collaborative partnerships with many communities (The National Farm, 2004). The fact that farm to school programs are increasing alongside the implementation of school gardens is inspiring, but more information is required if programs are going to be sustainable (Blair, 2009; The National Farm, 2004).

Conclusion

In the school garden literature, although the focus is on the children, projects are often led by teachers (Cutter-Mackenzie, 2009; Wake, 2007). Sometimes, adult initiatives cloud the potential for children's exploration in gardens with initiatives towards health and wellness, or another topic of the adults' choosing (McAleese & Rankin, 2007). Although experiences in the garden can still be beneficial for children when activities are lead by adults, there is very limited information about what happens when children take the lead, particularly as learning occurs in an enrichment cluster (Cutter-Mackenzie, 2009; Renzulli, 1978; Wake, 2007). Because children are innately curious, gardens can offer an array of experiences for children of all developmental ages, as well as experience levels (Dewey, 1956; Smith, 2002). As education, gardens provide a space for children to learn through direct, hands-on experiences with freedom (Cutter-Mackenzie, 2009; White Hutchinson, 2001).

Additionally, in the literature that discusses environmental education as a means of connecting children to their environment, the focus is on the engagement and interaction in the classroom or schoolyard (Clarke, 2002; Malone & Tranter, 2002; Nimmo & Hallett, 2008). Even so, little information exists regarding how gardens are constructed, as well as how they are maintained (Blair, 2009). What are the

possible political and community implications of creating working school gardens (Kingery-Page, Hunt, & Teener, 2010)? Although there are numerous studies that have looked at the benefits of school gardening, most include specificity regarding educational concepts, i.e. math, science, and environment (Klemmer, Waliczek, & Zajicek, 2005; Robinson & Zajicek, 2005).

There are fewer studies that have explored the garden experience from a qualitative perspective (Blair, 2009). Although school gardens are sprouting up across the nation, little is known about outcomes related to the experiences of everyone involved (Joshi, Azuma, & Feenstra, 2008). In addition, there is limited mention of how family and community participation can influence students' engagement (Casey, Szeto, Lensing, Bogle, & Weber, 2001; Trexler, Johnson, & Heinze,2000).

There is limited information about how school gardens and farm to school programs impact the community (Joshi, Azuma, & Feenstra, 2008). This is important to consider because stakeholders in the community can be powerful contributors to the program (The National Farm, 2004). When community members are involved, there is potential that they will invest in the future of the program, providing support indirectly and directly as needed (Joshi, Azuma, & Feenstra, 2008).

Focus of inquiry

In this study, I examined how kindergarten, 1st and 2nd grade students learned about vegetable gardening through an interest-based enrichment cluster that enabled them to explore the garden together. This addresses the limited research on how young children engage in interest-based, experiential

opportunities in a school garden. Because there is limited research on how family and community partnerships occur and what they contribute to the experience, I inquired about that process as family and community were invited to participate. To understand the process of learning in the garden for children, as well as how teachers, family, and community members influence learning opportunities, I provide a narrative of children's experiences in the garden as they became action researchers and asked:

1. As the children participated in the vegetable garden cluster…
    a. What did students learn?
    b. How did they learn?
2. As invited members….
    a. What information did family members share? How?
    b. What information did community members share? How?
    c. How did the involvement of family and community members in the vegetable garden cluster impact what and how the students learned?

I used these questions to frame a participatory action research project. Because this garden is part of an enrichment cluster model, it the students' interest and desire to learn about gardening is presented. As children took action in the garden, they determined the path we took as action researchers and directly informed potential future cluster activities.

CHAPTER 3

METHODS

Subjectivity Statement

Although my topic of interest has evolved throughout my graduate education, children have remained at the center of my focus. From my time in the area, I realized how many resources the city provides regarding opportunities to engage in agricultural experiences. Through experiences on farms and in gardens, I realized that I could combine my desire of working with children and families with my passion for local agriculture, hopefully introducing and encouraging participation in the community, not only as a member, but as an advocate.

As a researcher, I am interested in exploring the ways that children learn about their environment. As a human being, I am interested in sharing my philosophy of living consciously with young children. In the schoolyard, I am able to bridge my professional and personal motivations as decisions and work occur in the vegetable garden. In this study, the focus is on vegetable gardening and students' process of learning with each other, teachers, family, and community members. I hope that through the research, teachers, families, and community members can see the importance of connecting themselves to the environment, particularly while connecting to each other.

To understand the present, and possibly the future, I do need to look back. What were the experiences that I have had that have colored, influenced, and

affected my ability to be a researcher trying to understand the learning processes and influences that can occur in a classroom as children actively engage with one another and their families? I must "reach back to become present" (Williams & Fromberg, 1992, p. 38), allowing my interpretations to be grounded in the participants' experiences. Reaching back might open up doors to having conversations with children and allow me to think back to my experiences in school and make the connection to their experience. I can build upon knowledge that is based on past and present experiences while inquiring into to what the future may hold. I hope that this sustains meaning making in a relevant way, so I can further prove that learning truly is built upon a foundation of many individuals and experiences, not just within us.

In developing a participatory action research study, I believe that it must be collaborative, and most importantly, I must acknowledge the many contributors and communities that do take action. In research, the process can often be isolating, but in practice, it truly does incorporate many members, whether in the academic, professional, or participant communities. It is important to utilize the funds of knowledge within the communities that are directly or indirectly affected by a study taking place right it their backyard. As an emerging action researcher, I "recognize the existence of a plurality of knowledges" (Kindon, Pain, & Kesby, 2007, p. 9), which often reflects the world. As the world changes, so should the research. In that sense, it is unrealistic to think that my expertise will continue to produce knowledge the world wants to see, or is relevant. For me, it is also important to seek expertise

beyond the university walls and into the real world, where professionals are already working in the trenches, creating changes in their communities.

I must recognize and reflect on my thoughts because they often "grow up unconsciously. They are picked up—we know not how. From obscure sources and by unnoticed channels they insinuate themselves into the mind and become unconsciously a part of our mental furniture" (Dewey, 1933, p. 7). This is an important thing to acknowledge because I was challenged by things I observed, heard, and experienced, whether it was in the garden, classroom, community, or in family's homes. It is crucial that I maintain constant reflection throughout the research process so that I authentically represent those I was inquiring with, remaining true to who they are instead of projecting my perceptions onto them.

The best kind of thinking is reflective thinking: "the kind of thinking that consists in turning a subject over in the mind and giving it serious and consecutive consideration" (Dewey, 1933, p. 3). This definition of reflective thinking is indicative of action research as well in that the thought must be inquired about in terms of taking action, then once action is taken, the evaluation portion allows for reflection in thinking about how that process worked or did not work.

Epistemological Framework

> Every living creature, while it is awake, is in constant interaction with its surroundings. It is engaged in a process of give and take, of doing something to objects around it and receiving back something from them—impressions, stimuli. (Dewey, 1933, p. 36)

The definition of research is important to define using my theoretical frame. Basic research is defined as a researcher conducting a study on participants. Inquiry however is a more flexible term that encompasses ideas of researching with the participants (Goswami, Lewis, Rutherford, & Waff, 2009). This idea, originally introduced by Emig (1970 as cited in Goswami, Lewis, Rutherford, & Waff, 2009), is concerned with connecting context and issues. For this study, I am not *doing* research, but I am inquiring into the processes of collaborative learning in a classroom with students, teachers, families, and possibly community members. Using the term research implies that I am leading the charge (Vygotsky, 1978). In reality, I am merely guiding the participants as they engage in research, which is framed by my epistemological stance.

This study is embedded within many communities and relies on the social nature of learning and experience to explore how theory informs practice in a situated context (Manzo & Brightbill, 2007). To understand how individuals within those communities operate as a group for change, participatory action research was used as the methodological framework (Stringer, 2007). As a participatory study, it was important to observe how social interactions within the communities studied occurred. This is particularly true because ontologically, individuals exist in social, cultural, and historical contexts, which not only influence, but also create and inform reality (Patton, 2002). Epistemologically, I believe that individuals know what they know through interactions with various contexts, both people and environments. Social constructionism is based on the idea that knowledge is socially constructed by a "discourse about the world…as an artifact of communal interchange" (Gergen,

1985, p. 266). This provides a framework for posing questions to understand realistic action and choices that communities make (Gergen, 2001). As such, social constructionism structures my method of understanding how participants make sense of the communities they experience, and how they interact within them to take action.

The historical foundations of social constructionism are based in the sociology of knowledge first introduced by Max Scheler (Berger & Luckmann, 1966), which interrogated ideas of what reality is and how individuals construct knowledge about it. Berger and Luckmann (1966) adapted Scheler's thoughts for the Western world through a sociological lens and stated that reality is a "quality appertaining to phenomena that we recognize as having a being independent of our own volition" (p. 1). Therefore, individuals construct knowledge when they recognize that the phenomena are in fact real through their experiences. Berger and Luckmann (1966) give these simplistic definitions to demonstrate the social nature of reality and knowing by focusing on the notion that people in different contexts have different ideas of both reality and knowledge. This discourse recognized that it is the individual, in situated contexts with other individuals, that determines what knowledge and reality are, focusing more on what knowledge means to those constructing it, as well as how it is maintained (Berger & Luckmann, 1966).

Therefore, "the sociology of knowledge is concerned with the relationship between human thought and the social context within which it arises" (Berger & Luckmann, 1966, p. 5), a thought that laid the modern groundwork for social constructionism. Using the sociology of knowledge as a framework, the knowledge

individuals construct about realities leads to habituated actions. Each person has a specific role, particularly in the context of societies and communities (Berger & Luckmann, 1966). In this way, it is important to understand the limits that the social, cultural, and historical nature of society put on knowledge construction.

As individuals interact with the environment, communities, and others, meaning making occurs (Raskin, 2002; Vygotsky, 1978). Constructivist perspectives view the individual as central to the meaning making and knowledge construction process (Edwards, 2005; Raskin, 2002). For a constructionist, the intrapersonal process does not occur in isolation, nor can it be separated from the social, cultural, or historical contexts (Raskin, 2002; Vygotsky, 1978). As interpersonal development occurs, the cultural tools that are part of an individual's repertoire are deeply rooted in social, cultural, and historical contexts (Rogoff, 2003; Vygotsky, 1978). Therefore, individuals construct meaning through an iterative cycle in which internal and external forces interact (Gergen, 1985). As individuals interact, knowledge is constructed, and the individual has experiences based in the social world that enable them to make meaning and connections as they engage with others (Rogoff, 2003; Vygotsky, 1978).

To understand this idea, postmodern and social psychology perspectives were used to understand that individuals live different realities, in which they expose different identities based on the individuals and/or environments (Gergen, 1985). Because there are multiple realities and identities, knowledge is "local and fleeting" (Raskin, 2002, p. 9) and heavily influenced by the discourses used to

communicate the nuances of reality. As discourses are used, learning occurs through cooperation (Raskin, 2002; Shotter, 1993).

Critics of social constructionism are cautious to move too far away from the internal processes used to create meaning. The notion that reality is always changing and that multiple identities are possible may be too subjective for those who search for more objective evidence about reality and knowledge (Raskin, 2002). However, the constructivist perspective that is often misleadingly pitted against *constructionism* shares the goal of meaning making (Raskin, 2002).

In early childhood education, Piaget is a constructivist that has influenced the way children are understood (Edwards, 2005). As postmodernists and social constructionists entered the conversation, Piaget's ideas were deconstructed to view children as independent in the active cognitive process of constructing meaning (Edwards, 2005). From this perspective, children actively construct new meaning based on experiences. This differs from social constructionism because meaning is constructed through interactions that then continue to be sustained by social processes, not within the individual (Young & Collin, 2003).

Although often misunderstood, or not acknowledged, Piaget did recognize that individuals do not exist isolated from the world. He understood that external forces do influence meaning making (Edwards, 2005; Piaget, 1999). For social constructivists, internal cognitive processes do generate meaning, but are influenced by social and cultural contexts (Edwards, 2005; Vygotsky, 1978). In the literature, Vygotsky is regarded by both social constructivists and social constructionists as a contributor, and they recognize that his dualist view of

meaning making creates divergence within both philosophies. He recognized "that influences on individual construction are derived from and preceded by social relationships" (Young & Collin, 2003, p. 376). However, the dualism of individual and society is often disregarded (Young & Collin, 2003). Even Vygotsky (1978) shifted from an individualist view of explaining societal influences by focusing on the social processes themselves as he interrogated the constructivist perspective.

The exploration of knowledge generation in the garden will rest on the idea that "all claims to knowledge, truth, objectivity or insight are founded within communities of meaning making" (Gergen, 2001, p. 2). Reality and knowledge were constructed through social interactions. I observed the collective communities that formed and understood them using sociocultural theory and funds of knowledge. These theoretical frameworks allow me to extend the broad philosophical notions of social constructionism and apply them in a situated way to communities taking action in the garden.

Theoretical Framework

My theoretical framework is framed by social constructionism and informed by sociocultural theory and funds of knowledge. Each of these perspectives is interrelated and forms the foundation for how I viewed this participatory action research study. Social constructionism addresses the social nature of meaning making (Raskin, 2002). Sociocultural theory takes the social, cultural, and historical nature of society or the environment into account to understand how knowledge is known, and then constructed through interactions (Rogoff, 2003). Funds of knowledge address how knowledge is known and practiced so that it is possible to

understand not only the practices that individuals, families, and communities have, but also how they view and use those practices to create, construct, and communicate knowledge (González, Moll, & Amanti, 2005).

Sociocultural Theory. Sociocultural perspectives look at how individuals develop through interactions with others, not necessarily how individuals are influenced by interactions (Young & Collin, 2003). In this view, the "transformation of participation perspective" (Rogoff, 2003, p. 52) is key because it recognizes that the development of individuals is dynamic due to the interrelated nature of sociocultural factors and individuals' experiences (Rogoff, 2003). To understand development using this view, I must discover everyday experiences that occur within relevant sociocultural contexts. The cultural tools that individuals have been socialized to use are revealed, particularly in terms of how individuals use them in communities (Vygotsky, 1978). As individuals interact with one another, cultural tools are shared and transformed as new meanings and discoveries are made (Rogoff, 2003). To understand how transformation occurs, the connection between the individual and cultural processes must be examined (Rogoff, 2003).

Vygotsky believed that cultural processes provided individuals with tools to reconcile how they thought about and constructed meaning about experiences. These tools stem from socialization practices that families engage in from birth. From the beginning, children exist in communities with specific discourses and practices that are informed by the social, cultural, and historical contexts from the past, as well as present and future experiences. Therefore, individuals' intrapersonal interactions take place within the context of interpersonal experiences (Vygotsky,

1978). This means that the individual cognitive process works in conjunction with social practice.

In this way, individuals' tools are constantly shaped by their experiences, are then used to construct and reconcile new meanings (González, Moll, & Amanti, 2005; Vygotsky, 1978). The primary tool that Vygotsky emphasized was the act of speaking as a tool that individuals can utilize to share and construct meanings together as they interact with one another and the environment (Vygotsky, 1978). The egocentric or private speech that individuals use is an intrapersonal tool because it is within the individual, but can be used interpersonally to interact and relate to others (Vygotsky, 1978).

Interactions are important, as Vygotsky believed that individuals develop in the "social, cultural, and historical context" (Rogoff, 2003, p. 50) that they experience. He argued that an individual's actions could not be separated from the contexts in which they exist and participate. Each influence provides the framework for the cultural processes that individuals experience and confront on a daily basis, and those, which they use to think about their role in society (Vygotsky, 1997). As individuals develop in sociocultural and historical contexts, they are socialized and given cultural tools that may be symbolic or material. The socialization process that occurs enables individuals to learn how to use their cultural tools in specific ways, for specific things (Rogoff, 2003).

Individuals learn to use these tools through interactions with others and refine them through concepts like zone of proximal development. Using this process, Vygotsky believed educative experiences could enable individuals to reach their

potential (Vygotsky, 1978). To do so, it is not imperative to create developmentally appropriate opportunities to prevent potential from being stifled (Vygotsky, 1978). To compensate, an actual developmental level and a completed developmental level were proposed. Because learning is constructed through interaction, Vygotsky believed that the process of working with another to reach potential was much more representative of an individual's ability rather than what they could do independently (Vygotsky, 1978). Over time, individuals are able to think intra- and interpersonally, and transform the cultural tools they have been given into tools they use to learn. It is important to recognize that this process is dynamic. Vygotsky emphasized the spiraling nature of development in that individuals learn by internalizing the information they received externally many times, particularly as they interact with others (Vygotsky, 1978).

Vygotsky framed the zone of proximal development towards interactions in classrooms. He believed that learning was created out of experiences that were not only influenced, but also determined by the environment constructed by the teacher who should act as a guide in the learning process (Vygotsky, 1997). In this way, Vygotsky (1997) stated that "the student is active, the teacher is active, and the environment created between them is an active one" p. 54). In this negotiation of learning, praxis is also important and why the process of learning is active and dynamic. In this study, the theory of how to solve a problem were practiced and turned into an action. This is important because knowledge should be rooted in direct experiences that are not abstract, but emphatically practical to elicit meaningful learning (Dewey, 1938; 1998; Vygotsky, 1997).

Rogoff (2003) criticized the limited scope of the classroom because it does not take into account the other environments where engaged interactions can occur. To address the dilemma, she proposed guided participation, which looks at the varied ways individuals learn as they participate in activities that are valued in their community. The participatory nature of learning through interactions is relevant for the present study because it involves mutuality related to influence of ideas and creating shared meanings (Rogoff, 2003). Additionally, I believe it is possible to reconcile Rogoff's criticism of learning in the classroom by recognizing that Vygotsky did discuss the importance of specialized abilities in the learning process. Although he did not specify that specialized abilities could be obtained outside of the classroom, he did integrate the sociocultural nature of the tools individuals use to learn. In this way, the tools individuals bring into the classroom are therefore deeply rooted in the external world, not only in the classroom (Vygotsky, 1978).

On a basic level, individuals do think intra- and interpersonally. However, they do not do so in isolation, and as stated, they cannot be separated from contextual influences such as cultural tools or other individuals (Rogoff, 2003; Vygotsky, 1978). Therefore, meaning making is also a process that happens amongst and within a community as individuals come to understand their world and experiences through interactions with others (Rogoff, 2003). Defining community is important to frame my theoretical perspective, and therefore the study as well. This is a concept that I interrogated as a researcher, and a definition I must constantly question. My participants were asked to define community for them, creating a shared sense of community in the process.

As Rogoff (2003) describes it, communities are "groups of people who have some common and continuing organization, values, understanding, history, and practices" (Rogoff, 2003, p. 80). Important to this definition is the sense of continuity and commonality, and the idea that communities are created over generations and long periods to allow history and common practices to be formed. However, I believe that it is possible to create a community that is not generational or extensive, particularly based on my experiences in the garden with students. To have a community, commonality through communication is possible and can occur in shorter periods of time as individuals construct meanings together based on their shared practices (Dewey, 1916 as cited in Rogoff, 2003), particularly when practices are recognized and utilized as a transformative process within a community. For this to occur, funds of knowledge need to be understood in the context of everyday life both inside and outside of the classroom community.

Funds of knowledge. In trying to understand the everyday experiences that provide the background for meaning making that individuals construct as they interact with others, it is essential to recognize that each individual's experiences are based in social, cultural, and historical contexts (González, Moll, & Amanti, 2005). In *Funds of Knowledge*, González, Moll, and Amanti (2005) discuss their avoidance of the term "culture" due to the "loaded expectations of group norms and often-static ideas of how people view the world and behave in it" (p. 10). Instead, they focus on the practices used by households and how those practices are viewed. With this view, the practices of individuals within a family become their funds of knowledge, or knowledge and resource collection. The authors also emphasize the

fact that individuals and the world they experience every day are not mutually exclusive (González, Moll, & Amanti, 2005).

Through this study, I wanted to understand the learning process that took place when individuals drew upon their funds of knowledge to further understandings of experiences working in a vegetable garden. Funds of knowledge are a generative process to pass on practices. This aligns with social constructionism because knowledge is constructed through interactions in both. It is also consistent with my sociocultural lens because it takes the social and cultural context of the home, or community into account.

In facilitating this participatory action research study, also saw how socially constructed knowledge is shared amongst a new community of learners with individual sets of funds of knowledge. A focus of the study was to gain consensus on a plan of action, which I identified as overall group well-being. The idea of well-being is an integral aspect of funds of knowledge because families have cultural resources that are "an essential tool kit that households need to maintain (mediate) their well-being" (González, Moll, & Amanti, 2005, p. 19). As the individuals in the classroom created a new community within that context, new or adapted funds of knowledge were created. As participants shared and collaboratively formed ideas and plans of action, funds of knowledge were "modified, discarded, or produced" (González, Moll, & Amanti, 2005, p. 26).

Using funds of knowledge as my definition for culture in this study enabled me to look deeper and observe how the active negotiation between participants' competing or aligning perspectives takes place in the classroom. In particular, I

observed how families passed on funds of knowledge through experiences at home. I observed students' words and actions in the classroom as they actively engaged with one another to solve a problem. I used that data in comparison to the data from weekly letters and family interviews. In this way, I discovered the knowledge transmission that occurred implicitly in everyday experiences.

As the participatory action process occurred, the recognition of each other's funds of knowledge validated the many perspectives in the classroom because negotiation occurred to reach consensus about solving the problem (González, Moll, & Amanti, 2005). It is important to use the process to inform practice because it was a participatory action study. The actions that occurred in the classroom represented the organic changes as knowledge was socially constructed (González, Moll, & Amanti, 2005). As participants collaboratively diagnosed a problem and thought about how to solve it, whether they realized it or not, they are "theorizing practices, learning, and developing as researchers" (González, Moll, & Amanti, 2005, p. 117).

In the classroom, the goal was for the students to learn about gardening, but it was also about connecting them to the earth as socially responsible citizens who understand how they can acknowledge the present to take action for the future (Berkowitz, Ford & Brewer, 2005). To do so, it was important to understand the factors that influenced learning. Society is structured in terms of how individual experiences occur within the contexts of society, imbued and influenced by experiences inherent in living in particular communities (Rogoff, 2003). The social practices that occurred outside of the classroom, for teachers and students, were influenced by their environments and social practices, or funds of knowledge

(González, Moll, & Amanti, 2005). Although teachers can control the practices in the classroom, the students took control in situations where environmental supports facilitated it, such as an enrichment cluster where they were encouraged to do so (Renzulli, 1978). Looking at these structures and influences from a social constructionist perspective, with sociocultural and funds of knowledge, I can identify the importance that not only the individual has on society, but how society influences the individual in a reciprocal relationship that is continuous, dynamic, and intertwined (Williams & Fromberg, 1992).

Methodological Framework

Action Research. The theoretical framework that I employed enabled me to understand the processes of learning about vegetable gardening in the classroom, as well as how the family and community members influenced that process. To get at the funds of knowledge that address the process of inquiry and the nature of the culture (practices) that participants live every day (McTaggart, 1997), I used participatory action research. This methodology connects theory to practice (McIntyre, 2007). In using a social constructionist, sociocultural lens that employs funds of knowledge, I uncovered how the central idea of collectively constructing meanings based on experiences relates to learning about vegetable gardening. Then, I used the meaning making experiences and knowledge to inform how future learning opportunities involving the garden occurred.

Action research in education is often defined as any "systematic inquiry conducted by teachers, administrators, counselors, or others with a vested interest in the teaching and learning process or environment for the purpose of gathering

information" (Mertler, 2009, p. 4; McTaggart, 1997) and improving it. In this case, I am classified as the other. I am not a teacher, but I do have a vested interest in the learning process that occurs in relation to the vegetable garden. After a year of working collaboratively with a teacher to use an enrichment cluster as a tool for engaging students in learning about vegetable gardening, I am invested.

Because of my previous experiences in the school garden, I was interested understanding the process of learning that occurred when students, teachers, families, and possibly community members engaged in learning together. What are the shared funds of knowledge, and how does the collaborative learning experience influence exactly how and what students learn about vegetable gardening? Using action research is not enough because I am not only evaluating my research practice, but the process of community learning. I can explain how all participants, mainly the students, took action as well. In PAR, the participants are fully involved from beginning to end in determining what the problem is, how it was addressed, and whether or not it worked (McTaggart, 1997).

The context of this learning community was specific to the individuals and experiences within in it, but their process of learning provides insight for others into the types of experiences that are possible. In addition, the insights gained from this study were framed in such a way that they feed back into the next vegetable garden cluster so that the knowledge gained from the participants' work will inform potential problems posed to the next group of action researchers.

Participatory action research. In participatory action research, the focus is on the process, but it must be included in the context of "the social structures and

processes" (Whyte, 1991, p. 97). Participatory action research is really just a "participatory approach to action-oriented research" (Kindon, Pain, & Kesby, 2007, p. 1). It is also about social transformation (Kindon, Pain, & Kesby, 2007). In this project, my intention was to create a context for participants to engage with one another, which to me, addresses social transformation since students, teachers, and family members, along with possible community members will collaboratively plan and engage in an inquiry-based research project.

Participatory action research includes consensus to investigate a problem, reflection amongst all participants, collective decision making, and relationships between the researcher, or worker, and the participants. It is important to note that this process is not static, but dynamic and evolving (McIntyre, 2007). To follow these steps effectively, the participants and I engaged in this process many times during the research study and is why Lewin (1946 as cited in McTaggart, 1997) emphasized the spiraling nature of the process, much like Vygotsky (1978) described learning and development.

Theoretically, participatory action research is based in the idea that people learn socially through experience and action (Kindon, Pain, & Kesby, 2007). Therefore, the purpose "is to build collaboratively constructed descriptions and interpretations of events that enable groups of people to formulate mutually acceptable solutions to their problems" (Stringer, 2007, p. 189-190). This can be viewed as an idealistic way of engaging in research, but, the process is cyclical, so multiple plans and solutions were possible.

Sometimes, the path that the participants took did not work out. Although they ultimately made that decision, and revisited their ideas, Nora and I helped them discover whether their path was leading them in the direction they wanted to go. As a worker, not a researcher per se, my role was to facilitate the process and help them examine their plans and solutions. Additionally, another purpose of participatory action research is to generate new meanings about an experience (McNiff, Lomax, & Whitehead, 2003) that is unique, so it was messy.

Who are the stakeholders? Participatory action research is context specific and "based on localized studies that focus on the need to understand *how* things are happening, rather than merely on *what* is happening" (Stringer, 2007, p. 19). To get at the how, I focused on the process of what occurred in and out of the classroom. By using this method, I facilitated the process of inquiry during the study by the stakeholders involved in the vegetable garden.

Stakeholders were defined as individuals who have a stake in the garden, and agree with the problem of: We have a vegetable garden, now what? As stakeholders, family members worked with their children to "perceive, interpret, and respond to events related to the issue being investigated" (Stringer, 2007, p. 19). As each stakeholder sought to find a solution to the problem of what to do with the garden, they participated in the action component of the study. These stakeholders were my participants, and I sought to understand how they "initially clarify the issue investigated and to reveal the way participants describe their actual experience of that issue—how things happen and how it [affected] them" (Stringer, 2007, p. 19).

Within the classroom, the students were the primary stakeholders because it was their garden. Because the enrichment cluster was interest-based and student-centered, it was the students' responsibility, with guidance from teachers when needed, to delve into their own inquiry-based investigation about what the steps should be to fulfill their plan for the garden. Both in and out of the classroom, family members were also stakeholders in the garden. Family members were invited to participate in the garden directly through workdays or other cluster meeting times they wanted to attend, as well as indirectly through knowledge and information shared with their children or me through the weekly letters. Teachers were also stakeholders because it the project took place in their classroom. The teacher and student teacher were all-important participants and actively engaged in the project to provide additional funds of knowledge.

It is also important to note that participatory action research is based in the community, the context in which it is taking place (Stringer, 2007). For this study, various communities were identified to help solve the problem. Because the classroom was the primary location of inquiry, the community therefore was defined by the students in the classroom. Geographically, the walls extend beyond the school and into the garden. Within the walls, the students were encouraged to work together as a learning community, with teachers, family, and community members as resources to draw from. To get at funds of knowledge, or the practices used inside the classroom, I looked at how stakeholders within the classroom viewed those practices. As discussed, this is my definition of culture and was

pertinent to the study to understand more about how stakeholders "perceive, interpret, and respond" (Stringer, 2007, p. 19) to the garden inquiry.

Beyond even the garden, the community extends into the family members homes. As part of the study, I visited the homes of some of the families to interview them. I wanted to visit the homes because it provided further context to understand what their funds of knowledge were and where they stem from. I was able to provide an account of the community that I perceived and identified, but it was up to the families to share their own definitions. Even further extended, the community members, were initially invited to share their knowledge about vegetable gardening based upon what the students wanted to do, but they did not visit the garden more than once, if ever.

How did it look? The basic components of a participatory action research project follow three main phases. In the first phase, the participants were given the broad problem, and they were asked to personally "define and describe" (Stringer, 2007, p. 40) what it is and how they want to investigate it. In this stage, they students gathered information and formed a plan (Mertler, 2009). Secondly, they "analyze and interpret" (Stringer, 2007, p. 40) their plan of action to develop an understanding of the problem. Once this transpired, the third phase began because the participants put their plan into action. The part of action research that is exciting (and messy) is that many influences can come into play. Students had different definitions and plans, so the plans they chose to act on were constantly evolving throughout the entire process.

To begin this participatory action research study, Nora and I identified a broad problem or issue: We have a vegetable garden, now what? This question arose as a way to broadly define an issue that did not constrain the students', family members', or teachers' process of inquiry to plan and implement ways of addressing the issue. This was the basis for this study, and the various stakeholders will lead the inquiry into how the problem should be solved.

In the first phase, I needed to understand how the participants perceived the problem, which directed the rest of the project (Stringer, 2007). By observing the process in the classroom and conducting interviews with families, I got "additional data that can complement, clarify, and extend understanding of the events and other phenomena associated with the issue at hand" (Stringer, 2007, p. 83). Not only do these data collection techniques provide more data, but they also enabled participants to discuss what they were thinking and guided their garden inquiries. These phases are graphically represented through Stringers' (2007) Action Research Interacting Spiral, in which participants "look, think, and act" (p. 8) during each stage of inquiry. During and after acting, they must go back to the beginning and use their reaction to the action by looking and thinking again (Vygotsky, 1978).

Using this as a guide, participants reflected on the experience to understand where they went and where they were going (Kindon, Pain, & Kesby, 2007). Through reflection, they became "active participants in the classroom as well as active observers of the learning process" (Mertler, 2009, p. 12). Part of the process was to ask the participants to reflect on the experience so they interpret and evaluate the experience (McNiff, Lomax, & Whitehead, 2003). Because I focused on

the collaborative effort, special attention was paid to how the participants and the community were influenced. In learning experientially as part of a community engaged together, the participants felt ownership over the process and the knowledge gained (McTaggart, 1997).

I had to formally interpret the participants' experiences, but I was able to inform my interpretations through their own. As a researcher, the formal dissemination of their action plan appears in the findings section of the study. I made careful observations in the classroom while the planning process was taking place to see how students, families, and teachers expressed their funds of knowledge, particularly when community members were invited. It was important to understand and get at their funds of knowledge because they played a role in the classroom when actions were occurring (González, Moll, & Amanti, 2005).

Why did I use it? Because this participatory action research project was also experiential, it was important to make the connection to Dewey because he discussed experiential learning in a manner that is consistent with the foundations of participatory action research. Dewey (1938; 1998) described the need for an experience that is flexible, without a specific product, as well as one that allows critical thinking in regards to conflict or dilemmas. In addition, a hypothesis is needed so that a plan of action can be carried out. At the end of the experience, Dewey calls for learners to look back at the situation and assess the experience (Dewey, 1938; 1998; McTaggart, 1997). This logic of inquiry is directly aligned with the process of participatory action research and is therefore further justification for using this methodology with an experiential based vegetable garden inquiry.

As an inquiry-based project, the goal is not to come to an explicit, objective truth (because there is not one), but to understand the working realities of the participants. How did they use their funds of knowledge to solve a problem? How did they use their funds of knowledge to collaborate and come to a consensus? I intended for classroom, where most of the action occurred, to be a place for students and other stakeholders to discuss their perceptions and ideas. In doing so, they were able to "share experiences [and] they gain greater understanding of the realities of the situation and the potentials of constructing solutions to the problem that take these realities into consideration" (Stringer, 2007, p. 66). In addition, by discussing together, a collaborative effort occurred, that might at least lead to them to a place of consensus, a place they felt comfortable and supported in going.

Because participatory action research requires that action be planned, taken, and evaluated, social constructionism is aligned epistemologically because it too requires that the process of knowledge be looked at from multiple points in time. Current knowledge and discourses must be examined as "forms of understanding as they now exist, as they have existed in prior historical periods, and as they might exist should creative attention be so directed" (Gergen, 1985, p. 266). History informs the present, and so on to the future, but it does so actively between individuals in a relationship (Gergen, 1985). As the students took action in the garden, they used the knowledge of past cluster experiences, as well as shared knowledge from teachers, family, and community members to help them create change currently, as well as plans for the future.

Role of Researchers

Because this is a participatory action research project, there are many researchers (Stringer, 2007). To prepare for the project, I used my experiences with the teacher and paraprofessional in the cluster classroom. I also consulted with them to design a study that would authentically represent the students, families, and community members. As such, they are co-researchers with me.

My role. As a researcher, I am both an outsider and insider (Patton, 2002). From an emic perspective, I can feel and observe what it is like in the classroom because I have been there for a year and a half. However, I am not the primary teacher in the classroom, nor a teacher in an elementary school. As such, I also have an etic perspective that will enable me to sit far enough outside to see nuances and identify differences and similarities within and across students. Using both perspectives, I can gain a holistic view of the garden experience that is evolving and emergent as the students lead me on their journey.

Above, I discussed my role as a facilitator. In this participatory action research study, I did not *do* research on participants. Rather, I participated in the students' action research study. I told the students, ""I'm doing an important research project in this classroom. Is that okay?" As they said yes, I continued. "I just want to look, observe and listen and see how you learn about vegetable gardening. To what you say and what you do."

As a passive observer, I would not be able to understand the dynamic interactions taking place between students, teachers, and the environment (Whyte, 1991). I acted as a resource, collaborating with the teacher in the classroom to guide

the participants as they lead their investigation. Initially, my role was to act "as a catalyst to assist stakeholders in defining their problems clearly and to support them as they work toward effective solutions to the issues that concern them" (Stringer, 2007, p. 24). This is why the question (or problem) posed to them during the first cluster was broad and generalized. Nora and I tried to honor the students and not lead them in a direction that we wanted to pursue, not one they may choose. However, Nora and I recognize that we had an idea of what could happen based on previous cluster experiences. At times, questions we posed were leading because we knew that asking, "What does a plant need" could initiate the discussion of plant resources. Because we had our own agenda, we did not just ask them questions. Even though we imposed some of our ideas, we felt it was sometimes necessary to stimulate their critical thinking and help them see what they already knew.

Sometimes we struggled with what we knew could happen and what they desired, so we continuously re-negotiated a shared learning space to maintain a balance. We intended to motivate them to take action. Stringer (2007) discusses the "grassroots orientation" (p. 25) of the researcher's role in the process of participatory action research. He provides guidelines for researchers to follow, that include motivating stakeholders to take action based on what they know *now*, or what concerns them. In doing so, the participants think critically and decide on a plan of action that begins at the beginning (so to speak), not at the point from which I think they should be. In Stringer's (2007) presentation of these guidelines, one fits perfectly with the garden project: "plan how to keep what they want, and change

what they do not like" (p. 25). Because the identified problem is broad, the participants investigated what aspects of the garden they want to keep or change.

During this process of discovering, I was there to help them analyze where they are and help them "examine several courses of action and the probable results of consequences of each option" (Stringer, 2007, p. 25). In his words, I am a worker. As a worker, it is my duty to motivate, enable, help, and focus. Whatever the participants decide to do about the problem is their decision and their process of inquiry. The success of their resolution lies in their hands, not mine.

As a worker my role was to manage or facilitate the project in such a way that stakeholders and participating members of the research community came to a consensus about a problem. To do this, I had to be aware of lived realities and the funds of knowledge they had at their disposal. Because action research is specific to certain contexts, my role was to also "develop a context in which individuals and groups with divergent perceptions and interpretations can formulate a construction of their situation that makes sense to them all—a joint construction" (Stringer, 2007, p. 41). In creating this context, new meanings, created together, emerged as they engaged in their inquiry. Whyte (1991) calls these "creative surprises" (p. 97) and they embodied the focus on participants as researchers and learners in the process. This does not mean that I did not assist in decision making, but in doing so, I was aware of what the participants wanted to do and the direction they were moving (McIntyre, 2007).

To introduce the idea of including families in the project, I told the students, "I gave you all forms and talk about with your mom and dad and you can talk about

it and see if that's what you want to do." Nora also told them, "and show your family because some of you have gardens at home, and they may want to tell us about gardening; they could tell us what they know."

To understand the participants and what they knew, I visited their homes. In all cases I was an outsider, but I felt more disconnected when I was not able to communicate with them. Through my participation in the school and awareness of school demographics, I anticipated that some of my participants would speak Spanish. To effectively communicate with them through letters and interviews, I sought help. Instantly, I thought of Salvador.

Salvador's role. When the school first opened, he was a paraprofessional in Nora's classroom. Fortunately, he was experienced in agriculture. I consulted with Salvador, who played an essential role in this project, and we discussed his responsibilities. Because of his experience working directly in the cluster, and the fact that Spanish was his native language, I had asked him if he would be willing to help me with the project long before it was fully formulated. From the very beginning, he was involved. "It's a great project because they learn so much. The most important thing is that they have some association between what they learn in the classroom and then what to do. It is important that they can practice."

Initially, Salvador's observations of students helped everyone realize that families had funds of knowledge that could help us all learn. He explained further, "People coming from Central America have a close relationship between plants and life. My culture is about plants, we live about plants, and the plants are excellent friends with us. We respect plants and feel love for them. In some places, there are

no supermarkets, so you have to produce in your home." His passion for plants inspired me.

As I worked diligently to write consent forms that would accurately portray the students, as well as their families' roles in the project, he translated each and every word. It is not only his translating assistance, but his relationships with families that are important. "I think it's a good relationship because I try to help them, solve some problems. When they have problems, I help them. My wife, she is a chaplain, and we visit them. Sometimes, we have something, like, material things, and we help them. When we found out that Arturo's bicycle was stolen during our interview, he acted. "I bought the bike for him, he was so sad. I just wanted to help."

Without Salvador's willingness to help, this project would not have happened. In the beginning, he called families after all of the consent forms went home. He reassured families and explained the project to them. In some cases, I know that they agreed because of him. Because of everything he contributed to the project, he is a co-researcher. He explained the forms to families, particularly because some families were hesitant to sign anything. He explained the university rules and they often laughed that in their cultures, "My word is good enough."

Originally, Salvador is from Honduras but moved to the United States because of tense social situations that put his family in jeopardy. Although a professor in Honduras, his experience was not easily transferred to his new home. He loves educating people, so he decided to seek work in the school system. He has worked for two schools in the district as a paraprofessional, but is now a Spanish instruction teacher in the school.

When I asked him to explain his experiences in agriculture and teaching, he felt shy, “I don’t want to brag,” he said. I encouraged him, and he told me was “working at an agricultural school about ecology and entomology.” He explained that, “he missed that part, but it’s okay, now I have an opportunity.” “I’ve taught for 33 years,” he explained; “I love teaching.”

I asked him about his experience with the project, particularly with families. The families were okay, but sometimes they were shy because the barrier is the language, so they feel uncomfortable. But the enjoyed it, you could tell in the interview. They were reading the letters. Some of them didn’t come here, but they were involved in some way. They felt shy with you because…I felt the same way. How do I explain some things, express myself in another language?” He put them at ease, and “Sometimes when we visited them, they were talking about their lives, or they want to tell me something that wasn’t about gardening. Something was happening in their lives, and they feel okay to talk to me. They gave me confidential information because they feel comfortable.”

Because of everything he did, I asked him how I could possibly show him how appreciative I was. He refused to accept anything that could benefit him, but he did say, “It’s good to give people something, but…sometimes,…they are receiving and receiving. But teaching people how to plant and make your own food, this is the best way. The best way to help people is to teach them.” As we continued to talk about the families, he mentioned the garden located in the community where the families lived. “I think it’s important to involve more people in that area,” he explained. “Maybe you can do that, help them.”

Because it was her classroom, I consider Nora a co-researcher as well. If she had not welcomed my collaboration 2 years ago, I would not have conceptualized this project. Her passion for teaching and sharing learning experience with her students has always inspired me. As with Salvador, this project would not have occurred without her opening up her classroom to me.

Nora's role. Nora began as a kindergarten teacher at the school, "but I have all of the same kids in my classroom who looped up with me." Because she initiated the vegetable garden cluster, she explained why; "it was for sure my dad. He was a farmer…he was going to teach himself and learn from other people." She remembered that he gave her a book about "why being stewards of the earth is not indicative of taking over the earth, but of working with the earth and taking care of the earth." When "the seed was planted" by her dad, she began to make connections in her own life and realized that a lot of young children "have no idea that [their food] came from a farm originally." She also noticed that it could affect students. "I had one kid last year who…struggled academically." They planted beans in the classroom and he "would make a beeline for his cup every single morning…he asked me if it was going to grow." One day, when the plant sprouted, he said, "thank you for helping me grow a plant." At that point, she had "an inkling of how fulfilling something like [gardening] could be".

When I asked about the vegetable cluster, she explained that, "we're starting to see in clusters some of the same kids coming back, which is definitely different. Thinking about their needs and what they need to get out of clusters, and they're background knowledge is different because they've had experience with vegetables

and planting." To meet their needs, she promotes community in the classroom. "I am very community oriented and I try really hard to build up a family." She also spoke about her teaching philosophy, "it's called democracy and respect and listening to each other…we take each situation as it comes and try to be kind to each other and what that looks like and sounds like." She explained that it could be difficult during cluster meetings because students come from other classrooms and may not be used to her method. "I'm just weird; it's not normal to think that way I guess," she explained. I embraced her self-proclaimed weird methods and began recruiting.

Recruitment of Participants

In *Qualitative Research and Evaluation Methods*, Patton (2002) discusses sampling strategies. I used purposeful sampling because I was looking for participants who represented information-rich cases. As I sent information home about the project, 10 families gave parental permission for their child, and six of those families agreed to participate.

In the first week of clusters, I scrambled to find participants. The final list of students was sent on Monday of the first cluster week, and then a freak snowstorm the next day closed schools for the entire week. The following week, clusters were to begin as scheduled. I thought to myself, okay, I have plenty of time to send home letters. Then the realization struck that Monday was a holiday and the school would be closed again. I panicked and wondered how I was going to possibly get the information to students in time; I essentially only had 2 days.

Because of my role as a researcher and non-employee status, I did not have access to student records. Thus, I had to wait for families to send the parental

permission forms (See Appendix C), allowing their children to participate, back to school. By Thursday, I had a few permission forms and verbal consent from families saying they would also participate. Before the next cluster, I miraculously had eight student permission forms returned, and five families committed to the project. As I scheduled family interviews for the first weeks of clusters, everything fell so perfectly into place.

As I scrambled to send the information home with the students, I asked their classroom teachers whether their families would need Spanish or English (See Appendix A). It was suggested that any information I wished to share with families was sent home in the students' Thursday folder because that was the school's normal method of communication. This realization did not occur until the first day of clusters, when some teachers told me that the consent forms had been sent home.

Once parental permission forms were returned to the school, Salvador called each family that had received a Spanish permission form to explain the study, as well as the expectations regarding their participation. If the families gave him verbal consent, he scheduled an interview. Because of our previous experience working together, as well as the fact that he translated all documents pertaining to the study, he was acutely aware of me and the parameters of the project.

I followed the same procedure when English permission forms were returned to the school (See Appendix B). In addition, most families received a family consent form (See Appendix D) in their child's folder, but some families requested that the form be given to them at the time of the interview. As the first and second clusters past before family interviews were conducted, I could already see the

potential of this group to lead us in an exciting direction. During the first cluster, they were already sharing experiences with us concerning irrigation and planting strategies. I knew that family interviews would yield meaningful information that would help explain the knowledge the students were already sharing.

Nora Carnes was identified because she and I began the vegetable garden cluster one year ago, and she had agreed to participate (See Appendix F). The student teacher was also asked to participate before the cluster began (See Appendix F). Participating community members were groups or individuals who the children identified or who have public interest in vegetable gardening (See Appendix G). Before the cluster began, I wrote a grant for garden support from the local chapter of Keep America Beautiful, so they are included as participants. While making plans for the garden, the students recognized that they needed additional help and wrote letters requesting it from community members. After giving the teachers permission to contact communities that could help us, I spoke to the individuals who had funds of knowledge (González, Moll, & Amanti, 2005) that could help the students grow a garden. As I showed them the student letters, they excitedly agreed to participate.

Participants & Site. In this study, I examined how kindergarten, first, and second grade students learned about vegetable gardening during an enrichment cluster in a school located in a low-income area. As part of a School wide Enrichment Model (SEM), the school provided one hour each week for students across the building to collaborate with a teacher on a specific area of shared interest (Renzulli,

1978). I used participatory action research to remain true to the student-centered philosophy of a cluster, which were led by students (Renzulli, 1978; Stringer, 2007).

The garden is located in a school where 99% of the students receive free and reduced lunch. The population of students and their families is diverse socioeconomically, linguistically, and culturally. Of the student population, 67% are Latino/a and 27% are African American. Of the 510 students who attend this elementary school, 99% receive free and reduced lunch, and 150 students (29%) are English Language Learners receiving ESOL classes.

The school is also an elementary charter and professional development school that combine methods of traditional learning with a school-wide enrichment model that provides additional opportunities to individualize instruction. Vegetable gardening is the topic of an enrichment cluster and throughout the school semester, students explored that topic and addressed issues of regionality, seasonality, and plant resources.. The students' families, as well as some community members were invited to participate in activities and knowledge sharing opportunities, such as weekly letters. The background of all participants, teachers, families, students, and community members is presented, and I used pseudonyms for all participants to protect the identification of the school and other students not participating.

The vegetable garden cluster is guided by Nora Carnes, a first-grade teacher in the elementary school. This local elementary school was selected due to my past and current participation as a co-teacher during the enrichment cluster for kindergarten, first and second grade students. I collaborated with Nora and co-

taught the cluster meetings with her. The student teacher also participated in taking action in the garden because she was also a stakeholder (Stringer, 2007). It was important for me to gain her experiences and observations of how learning occurred in the garden (Patton, 2002).

Haley Welch. Haley is a senior, "early childhood education major" in her student teaching semester at the school. Because she was placed in the classroom for the garden cluster, I wanted to know about her interests and experiences gardening (See Appendix K). She spoke about her past, "my great grandfather, when I was growing up, he would, he had a huge garden. He had like corn and tomatoes and peas and…,he would just pick it and go give it to people." She remembered, "My grandmother would go to a farmer that lived nearby and she would get snap peas or something, and we would sit there and snap them and prepare them to be cooked." We talked about how those memories influenced her. "I've always wanted to grow tomatoes on my own, but I never really knew how. But I've never had the space to either, so that's one thing I'm looking forward to after I hopefully get my own space." I also asked, "Do you know anything about school gardens in Athens?" She said, "No, besides this one, I don't think I've heard of another one." Because she did not have prior experience in other school gardens, she was open to all of the possibilities in ours. "I mean having a student and a parent doing the same thing and having this experience, of course that's going to go home and transfer to their lives and communicate to the child that it is an important aspect of their lives."

Families and students. The garden cluster had 13 students from kindergarten, 1st and 2nd grade. Of the 13 students in the cluster, five were in

kindergarten, five in 1st grade, and three in 2nd grade. Each student chose to participate in the garden cluster, except for one student who reported that his teacher chose the topic for him. The students led our meetings and invited families and community members to participate, in addition to the letters that I sent home weekly. As various community members participated in activities and knowledge sharing opportunities, I looked at how knowledge shared by family and community members influenced learning about vegetable gardening and subsequently related topics.

To understand how learning was impacted by families, I needed to understand the funds of knowledge that was being accessed and utilized during clusters (González, Moll, & Amanti, 2005). To understand the practices families used, as well as how they spoke about them, I constructed family narratives based on our interviews, which represent the second step of my analysis process, the fine grained phase (Butler-Kisber, 2010). The families participated in the writing of their narratives because their words were used directly, although my lens was used to interpret it. In addition, each family was given their story to provide feedback and ensure that I represented them appropriately.

During and after the composition, I saw relationships between codes across families, and I noticed the nuances specific to each family (Charmaz, 2010). These nuances represent the thick description that I sought to provide (Geertz, 1973). Thick description is important to this study because each families' funds of knowledge are their practices and are unique to the way experiences are shared and then translated in school (González, Moll, & Amanti, 2005).

At the beginning of the project, five families agreed to participate. In the middle of the project, a sixth, Rose's family, decided that they wanted to participate. Three of the families were originally from Mexico, and preferred to converse in Spanish. The other three families were originally from Georgia and preferred language was English. To understand who they were and what their funds of knowledge might be, I asked them to tell me about themselves. To describe the participants, I present a small window into their past experiences, present lives, and potential future goals.

James, Maggie, and Finn. I eagerly awaited my meeting with Finn's family, especially after receiving phone calls from them, making sure that they would receive the interview guide that I would use. Their enthusiasm for participating in the project was energizing, so I was excited to speak with them. As I entered their home one late morning, I was greeted by James and Maggie, along with 2 interested and playful children. It was evident that their "3 beautiful kids" meant the world to them and played an important role in their family life. "Well, I'm just staying with the kids. As far as job wise, I sit at home and take care of my children. When I do work, I do mechanic work, I did 9 years of it. Other than that, there aint a whole lot to me." Besides the fact that he enjoys "playing pool, fishing. I love to fish," his family was the focus. Family was also important in their daily lives because Maggie "works at a gas station" and "runs the night shift for [her] dad."

As I learned about who they are today, I asked about their past. Originally from Ireland, James moved to Georgia when he was 3, eventually moving to the Athens area and meeting Maggie. He described his memories of planting seeds with

his family, detailing how to "make sure you till the dirt up, run some potting soil through it to keep the nutrients into it. Plant your seeds an inch, inch and half down, pack it loosely, not too tight. Constantly watering, pulling up dead leaves or anything to keep it growing properly." As a young boy, he spent time on his grandfather's property and learned "how to properly knowing the fruits and vegetables, just by touch, feel, and texture." As he continued to discuss his grandfather, a smile appeared on his face, particularly as he told us about his favorite thing to do. "He'd take me out to the garden, and he would walk through it and he'd show me how to pick out a nice, ripe tomato, and we'd go sit on the porch, and I'd sit on his lap, cut a slip in it, put in some salt, and he'd say "here, eat it". And that's what I did. And onions, but I never was an onion eater. Now my father on the other hand, that's where he got that from. He'd walk around with an onion in his hand and just eat." The ability to grow your own food and not rely on a grocery store "to buy vegetables" was a connection that James made, and one that seemed important to teach his family.

Similarly, Maggie "grew up on a farm, but I didn't do the gardening part. I grew up raising cows and chickens, pigs, feeding horses. That's what I grew up doing, but I didn't do any vegetables." After they met, James worked on Maggie's family's farm, working in the chicken house. "Well, I didn't know anything about chicken farming until I met her family, and then 2 weeks later, I got put to work."

When I asked about what they expected Finn to learn from clusters, James thought "it's good for kids to learn stuff outside of school, actually life. Yeah, you learn stuff in school and yeah, you're going to use some of that stuff, but the way I

was raised, you know, you go out, you learned, hands-on, you know. I did the school thing, I wasn't into it, I did it to where I could get by, but you know, I was always hands-on, that's how I had to learn. I had problems reading and comprehending. Over time, it got a little better and I fear that that might be Finn's, my kid's situation because she is the same way, or used to be the same way." The practical life experience of learning to grow vegetables was a humbling moment for me, and I was impact by his statement, realizing how important gardens could be for families. The fact that he felt that clusters would "broaden his mind and make his life better" was something that stayed with me and a contribution to the experience that Finn's family provided.

Sharon & Chloe. After hours, I entered the school and searched for Chloe's mom, Sharon, in the empty hallways and vacant classrooms. As I made my way to Mrs. Carnes's classroom, I could hear Sharon's voice wafting through the corridor. I approached the classroom and found her talking to Mrs. Carnes. I hesitated to interrupt, but was quickly noticed and invited into the on-going conversation. The past experiences that we all shared during the first cluster experience instantly created a sense of comfort in the room, that continued to emanate from both us during our 'interview' that truly felt like checking in with an old acquaintance.

As Sharon and I sat across from each other at the classroom table, I asked her to tell me about herself. Instantly, the importance of motherhood in her life was apparent to me, as she went on to explain that she "works at a gas station and pretty much I'm a mom of 2. Pretty much all my time consists of is working and being a mom." Although she began to discuss challenges in her life, that included a divorce,

and a recent and complicated pregnancy, Sharon maintained a sense of calm and joyfulness, choosing instead to focus her attention on the happy moments in life. “Cause, I don’t like wasting my time, my energy over something unless I know for a fact that I’m gonna be happy with the result. I mean, truly, heartfelt happy, not just momentarily happy.”

This sentiment that she shared encapsulates her attitude and is also evident in her daughter’s zest for learning about gardening during clusters. As we discussed her background in agriculture, she explained that she “used to plant flowers out in my front yard, just for the fun of it. And, pretty much all I really know is you dig the dirt, you put the seeds in or the flower buds, whichever you have, and cover it back up and I used to pine straw around it to keep the moisture in and put water on it.” Her laughter filled the room various times throughout our conversation, and was infectious, often enabling us to take the conversation in different directions, going with the flow. Ultimately, Sharon described how important her role as a mother has evolved into her involvement in the school, putting herself out there for the students. “You know, it makes me feel like I’ve done something to help their little lives, and maybe they’ll go on to be better people, and so I feel like that’s gotta be my greatest triumphant thing that I’ve done here.” Her comment was in response to a question regarding triumphant experiences in the school, and Sharon’s response reiterates her commitment to doing anything she can.

We parted ways that afternoon, excited to see what happened next in clusters, and excited to see what Chloe would take away from the experience. Sharon mentioned her admiration for Chloe’s interest in making the world a better

place to live by eliminating pollution through conservation and recycling, but she continued to bring balance back to the equation. Although supportive of Chloe's interests, she worried that she was too idealistic and needed to be realistic in ways she approached problems.

As we said goodbye, we focused on the positive and the upcoming experience of clusters. Unfortunately, I was only able to talk to Sharon twice during and after clusters. The balance of school involvement and life was compromised with the busyness of her work schedule, combined with severe pregnancy complications that prevented her from completing weekly letters, as well as a final interview.

Francis & Mason. I walked into Francis's classroom and sat down at a students' desk near the front of the classroom. As I waited for her to return from walking the students to lunch, I took in my surroundings, observing the student's work on the walls of the room. As Francis walked in, she sighed and smiled. A newly announced pregnancy had her feeling tired and sick, so she was thankful to have her lunch break to re-energize.

I discovered that Francis was a local Athenian and lived in the area most of her life, except for a short stint in Atlanta before returning to her roots to work as a teacher. Speaking of roots, she began telling me about her experiences with gardens. Although she admitted she didn't have much, she did admit that "I mean, I did have a garden when I was little. I don't know, maybe I got it from my grandmother because she was a very outside person. And I did one when I was older, probably like my first year in college when I came back home. I planted a small garden, like on the other side of the house, but nothing large or big." As a young girl, and when she

returned home and began a garden, she said that her "dad did most of the work. But he actually showed me how to hold the hoe and dig up the dirt and stuff, and how to put the seeds in and cover them back up."

As I probed to discover where the interest in gardening stemmed from, she thought that it was "sort of just a family thing that people were interested in doing." When I asked about any interest her son had shown, besides deciding to participate in the garden cluster, she laughed and threw her head back. She described him as someone who loves learning about new things, and "if it's interesting to him, he's going to ask more questions about it. So part of being introduced to gardening, he's probably going to want to plant one. I actually saw him through a window during clusters, and I could just tell that he was like "wow" about certain things he was listening to."

Karolina & Arturo. Before visiting this family, I felt like I knew them because of everything I had Nora and Salvador told me about them. The family was highly respected and was characterized as incredibly loving and warm. As our meeting was approaching with the family, Salvador seemed excited to see them, as he had met Arturo's father before at school. Because Salvador called to arrange the meeting in advance, Arturo knew we were coming to visit, and each time I saw him, he asked me if we were coming to his home soon. His excitement towards our visit was infectious, and so I anticipated our visit eagerly.

The day arrived, and Salvador and I set out to visit Arturo's family. As we hurried from the car to avoid the rain, the door opened for us. Arturo and his older brother sat on the couch, while his little sister sat with his mom next to them.

Salvador and I sat opposite them and we began the much anticipated conversation. Just to orient ourselves, Karolina told us that they were from "Michoacán, Mexico," but have lived in Athens for "12 years." On the day we arrived, Arturo's dad was working and Karolina explained that she doesn't "have work" because she lost her job and now stays at home with her daughter and cares for her niece. "But the bad thing is that only my husband works, and we don't have enough money." This part of their family story has such implications for the relationship that they have with Salvador, as well as for how they treat others around them. Although they experience challenges, their hearts are open for others.

Karolina explained that although she did not have much gardening experience, her husband did. When we arrived for the second meeting, we walked up to the door, the smell of grilled food inundated my nose, and I knew that he was cooking something delicious in the backyard. Along the sidewalk that led up to their house, there was a small garden bed that they said would be prepared soon for seeds. As we walked into the house, the entire family joined us in the living room, while his dad moved back and forth between the grill and the home, tending to the food. Because his dad wasn't there for our first meeting, we asked him what his background was in agriculture during our second meeting. He explained, "When I was in my country I planted corn, I planted peanuts and Jamaica (hibiscus flower) and beans, squash too." Salvador and Arturo's parents then began discussing putting the hibiscus into water for a refreshing drink, as well as using it to make wine.

*Iris & Mari*a. Iris greeted Salvador and I into her home and welcomed us into the living room, motioning for us to sit on the couch while we talked. Iris was

surrounded with her twin girls, who stayed by her side during most of our discussion, playing with toys and each other. After the meeting was underway, a tug on the front door led to Maria's arrival at home from school. With her was her older sister, as well as a friend from clusters. As the girls excitedly shuffled into the home, Maria smiled at Salvador and I, a little unsure of what to think about us being in her home. Then, they quickly disappeared into the back room to play.

Salvador's presence in the home left everyone at ease and appeared to help Iris feel comfortable while she told us about her life, past and present. After leaving "Michoacán, Mexico" 13 years ago, Iris and her husband settled in Athens and began adding to the growing family of 5 girls. Iris explained that she currently "is working at home" to care for her children.

When I asked about her experiences with gardening, she said that while she lived in Mexico, she was working on her families' land "planting squash, beans and corn." They also "planted green tomato, red tomato, and chile peppers." As we talked about her experience planting, I wondered about any ideas that she might have to make our garden successful. "No, I don't have much experience in that. What I remember was we would plant seeds, put dirt on it. Once it grew, we would remove the small plants and the weeds that grew around it. And we would put something on it to make it" grow.

I asked if she shared those experiences with the children, but she said that Maria did not have experience "in planting plants." She said that "it is possible that Maria visited the garden over here by the library because she goes down there with the tutors." The tutor trailer is located near the library and in close proximity to the

community garden located in front of the library. We asked if they had any plants at home to care for together. Iris explained that they did not, and she decided that a rosemary plant would be her choice. Salvador and I came back a few days later to deliver the plant and no one was at home, so we left the plant perched on the railing of the porch. When we came back for the second interview, we learned that "one of the girls knocked it down and we didn't notice. And…when we noticed, it had already dried out with this sun."

Cruz, Hilda, & Rose. Before we visited her home, Rose asked me when I was going to visit her home, smiling brightly as usual. When Salvador and arrived at her home, the entire family was there. Cruz and Hilda, Rose's mom and dad, greeted us with handshakes, smiles, and hellos. Before we walked inside, Rose proudly showed me her home. Once inside, everyone gathered in the living room to talk. Because of Salvador's previous relationship with the family, he spoke in English initially, with a little bit of Spanish thrown in. He explained, "This is a family that's really united." As Rose introduced me to her sister, her dad corrected her English, "this is my sister you say, this is my sister." As I described the project to them, Salvador made sure they understood, "you guys understand what she's saying?" "Yes…over the garden" Cruz replied. This exchange led to most of the conversation occurring in English, with a little bit of Spanish every now and again for support, particularly for Rose's mom who seemed less confident in her English speaking abilities.

Cruz and Hilda are both originally from Mexico. Hilda is from Michoacán and although he was born in Michoacán, he grew up in Mexico City. Upon moving to Athens 16 years ago, he primarily worked in construction "building schools." After

10 years of hard labor, “I start my own business. I sell produce at the flea market.” I knew that the family had access to produce grown locally because they explained that in response to one of the letters. Now it was becoming clear where they got it from, their business. He explained again that they have produce “from South Carolina and Florida” when it gets warmer, but “most of the produce comes from Mexico.” He explained that it “some vegetables don’t grow in the United States. They have to come from other countries.”

I was surprised when Rose’s dad said they did not have much experience with gardening because Rose showed me their garden when we arrived. “Oh yeah” her dad said, while her mom explained that it is “just plants that I like to plant.” Cruz continued, “We don’t have much experience. We just like to plant, to grow some. Sometimes we grow squash, cantaloupe, flowers, cucumbers.” He reminisced, telling us that, “I was a butcher all of my life, and when I lived with my father, we grew corn, squash, and a lot of things, but we don’t use nothing there like irrigation or something, only when the water comes with rain.”

We began talking about the “real organic” way to farm, as Salvador described it. “That’s what we do over there. We don’t use no chemicals, but the land was good you know? The corn grows big. And I don’t know much about irrigation, what kind of chemicals to use to kill the, how do you say, insects.” I asked about Rose’s participation in the home garden, and Hilda told that “she don’t like it much.”

I was shocked. I thought her excitement about the garden in school would surely translate to home, but no. “I ask her to help me and she say no” her mom explained. Cruz added, “maybe but I don’t know. She don’t like I don’t see much

interest in to practice you know the things like she already learned. I don't think she come and try to practice much." I was curious to see if this would change.

Regardless of where the families originated, what language they spoke, or what they did with their time, it was evident that each family had experiences in their lives that could help us in the classroom. In terms of background experiences, families shared memories with me about their childhood spent under peach trees, planting vegetables and flowers, discovering the difference between weeds and plants, and living on a farm. Throughout each of their stories, all mentioned time spent with grandparents and parents, showing them the way to cultivate the land and plants. In most cases, the memories were of walking through gardens with family members, picking vegetables, and then eating it. As each reminisced, their voices became excited and their eyes lit up, and some families explained that they had almost forgotten those memories, so grateful to be reminded.

Community Members. Because of my involvement with these community members outside of the school, I had existing relationships with them as we worked passionately and tirelessly to help cultivate community support for gardens. One organization, the local chapter of Keep America Beautiful, provided monetary support for the school garden through a grant they offered for green schools, a designation given to schools committed to environmental education.

They also do their part in the community. Debbie, the director of organization explained that they "organize a lot of community service for "beautification, so we do conservation education, we do litter pick-ups, and trying to get people to understand the consequences of littering, and trying to get them to

stop littering. And then…deal a lot with planting and also outdoor education, and I think how I feel that it relates to, it's not just planting, but ownership of your space…you pick up litter on your school yard, and that's caring about your space and taking care of it." All participants spoke about helping their community feel and take ownership over their spaces.

For Josie, an employee of the local KAB chapter, she is involved in environmental education opportunities as a parent of elementary-age children. As a member of the PTO, she has built raised beds at her neighborhood school and written grants to expand the abilities that parent organizations have to provide opportunities for their children in school. Josie was also appointed the head of the school grounds committee as was able to work on "restoring the habitat, which was the native plants and trees…and worked with the community tree council, [making them] a trees for tomorrow school."

Angie, the local agricultural extension agent, was invited because she knew about worms. To help care for her community, she is involved as an "ex-oficio member on the board (of a local farmers market); I help out with educational events at the market, and we have a master gardener booth at the market. We're trying to implement children's educational activities at the market this year and scheduling a weekly cooking demo, so it's pretty time consuming." As an extension agent, Angie has a particular skill set that she can provide to many different organizations, so she is currently involved in implemented educational in various places around the local community. "We're just trying to have little gardening activities, whether it's making seed tape, I know someone wants to make the seed balls, making newspaper pots

and planting seeds into them." Because she is a board member on a local non-profit and the farmers market, she is combining the likeminded interests of the groups and advertising the activities as a co-production of both groups, gaining wider audiences. The goal of most activities is to bring awareness to issues in environmental education through fun, hands-on activities that are targeted towards children, but also so "parents can see how easy it is." This way, the work that occurs in school can also find its way into homes, creating consistency.

A local non-profit agency that provides housing to low-income families, as well as conservation efforts within the community became a community supporter of the garden when I shared student letters and discussed our issues with water. Margie visited the garden with Claire, a water conservationist who helped address our water issues in the garden. The garden coordinator, Amy is a landscape architect who is passionate about revitalizing unutilized land. The agency also employs Margie, a horticulture expert who "could be out in the gardens and work directly with people…a little bit like an extension agent."Amy and Margie were hired because of a grant from The National Institute of Food and Agriculture that enables them to install or maintain community gardens. Through this initiative, they hope to bring together community members across the city and provide them with the necessary tools to have successful garden experiences.

Outside of their professional responsibilities, each community participant was involved in some way in their own designated community. The importance of community involvement for each community participant was important to their

personal lives, but the line between personal and professional was often blurred due to their passion for fostering a sense of ownership and citizenship for the earth.

Procedures

When developing a research project, it is important to approach the research participants to understand what they want to know, discover, or understand about a lived experience or situation (Allen & Shockley, 1996). In the development of my research, the children, teachers, families, and community in past classroom experiences helped me understand what was needed in regards to a research topic that would be meaningful and hopefully beneficial for all involved.

Participatory action research enabled me to encounter the world with my participants, living in and through the narratives they created about the experience together in the garden and classroom (Patton, 2002; Stringer, 2007). My field notes consisted of personal and social accounts of interactions, artifacts produced in and out of the classroom and homes, as well as interviews. I also explicitly took note of my experiences to question my assumptions and reflected on what I sensed in the environment (Butler-Kisber, 2010). In this way, I contributed my own narratives, particularly through weekly letters that concluded each cluster.

I utilized qualitative, ethnographic data collection methods that included observations, artifact collection, audio, and a reflective journal that included field notes. I conducted observations at the school using audio equipment. This information allowed me to understand the "actions and communications that reflect meaning [that] recur throughout the course of life" in the classroom, both for the teachers and the children (Heath & Street, 2008, pg. 11).

Observations. I spent time in the classroom collecting observational and interview data so that I could conduct an analysis of the discourses, both spoken and textual, that influence the everyday workings of the classroom (Heath, Street, & Mills, 2008). This included how they discussed and wrote or illustrated the topic, as well as how they interacted with each other, teachers, and other participants in the classroom. This information allowed me to understand the "actions and communications that reflect meaning [that] recur throughout the course of life" in the classroom, both for the teachers and the children (Heath, Street, & Mills, 2008, pg. 11), and also to observe how the students and teachers were participating as action researchers (Kindon, Pain, & Kesby, 2007).

My observations in the classroom provided a view of the broad landscape (Charmaz, 2010). The students' artifacts, family, community, and teacher interviews enabled me to narrow the focus, looking towards the elements of the project that were more explicit to provide more nuanced details (Charmaz, 2010). I collected the students' work as they created it. Because the nature of the garden cluster is to be student-led, the type of questions/topics in the letters, as well as the type of collected artifacts depended upon how the students chose to proceed during cluster meetings. Although there are aspects of qualitative research that can be more structured, the flexibility that it offered as a methodology allowed me to discover new data emerging from people or places not initially anticipated (Patton, 2002).

As the classroom community took action together, meaning was constructed (Kindon, Pain, & Kesby, 2007). Because it was difficult to identify specifically how meaning is constructed cognitively, I sought to try and tell their stories through

observations of my own and from others, such as teachers (Williams & Fromberg, 1992). To understand what and how children are thinking "consciously and expressly; with the situations in which they find themselves" (Dewey, 1933 as cited in Williams & Fromberg, 1992, p. 263), I looked at the narratives they expressed through scripted and spontaneous words.

When children immerse themselves in an experience, it is likely because they are interested, intrigued, and potentially enamored by it (Dewey, 1956). When this is the case, they are curious and it gives them the impetus to take initiative to learn more, facilitating the learning process as one that is "total and growing" (Dewey, 1956, p. 23.). Dewey (1956) emphasizes continuity in experiences, connecting the experience to education. In the garden, continuity was attempted through the weekly letters, allowing families to respond and contribute to classroom practice by providing their own scripts, or narratives. Also, the students experienced growth in the garden at school, and their experiences continued at home as they shared in the responsibility of discussing and providing for the herb plant.

The continuity in experience from home to school did more than connect the gardening experience to education, but also connected families with the experience and education. In this way as well, the experience became social (Dewey, 1956), where the child was "a social individual, one who is related, connected, and contextualized" (Williams & Fromberg, 1992, p. 77). From the community aspect, memberships within new groups formed through the organizational process of participatory action research. By engaging with students, teachers, and families

about gardening, each individual within various communities were invited to contribute and create a new narrative.

As Reissman (2008) described, narratives occur when "a speaker connects events into a sequence that is consequential for later action and for the meanings that the speaker wants listeners to take away from the story" (p. 3). In this study, narratives of the students, teachers, and families played an integral role in my understandings of how and what was learned. To understand the narrative of the garden experience, I needed to understand the narratives of the families who shared experiences and other stories with the children who were helping to shape the narrative in the classroom. Each story was nested within other stories. As Nora and I collaborated, we interpreted the students' stories. When we bring the stories back to the students, everyone is engaging in a new or continued narrative to work out the meaning of the experience (Reissman, 2008).

Interviews. Through interviews, I developed relationships with families (Charmaz, 2010). Because of my role in the project, as well as in the community, I represented families carefully. I recognize that issues of power may have existed, and I was cognizant of participants' perceptions of me throughout the research process (Charmaz, 2010). Most of the families opened their homes to me, welcoming into the life they experience every day. In some cases, the family's situation was not what I expected. In these cases, I negotiated the interviews carefully and constantly reflected on the assumptions I was making based on observations and interactions (Patton, 2002). Families were directly involved in the narrative that represents their experiences in various ways, reflecting their role in the participatory action project.

Initially, the families' narratives began with their response to my inquiry of involving their child and family in the research project. Their narratives continued during the interview process, as we engaged with one another in a conversation about their lives, their expectations for their children's experiences, as well as their knowledge contributions to the project (See Appendix H). Over the 9-week period of the garden cluster, some families directly contributed their own written narratives about the ongoing experiences of their children during cluster meetings, while some refrained for various reasons that I will address later. At the conclusion of the cluster, the families once again engaged in conversations with me regarding their overall experience and knowledge given and gained (See Appendix I). In these ways, families contributed to their narrative, both through silence and conversation.

I conducted semi-structured, conversational interviews to better co-construct a view and narrative of the world with my participants and involve them as much as possible as participants in the action project (Patton; 2002; Stringer, 2007). In some interviews, English was not the primary spoken language for families. For those situations, I received assistance from a translator, who I chose because of an existing relationship, both that I had with him and that he had with families. During those interviews, I asked questions in English that Salvador then posed in Spanish. In all instances, families responded in Spanish, which he then translated back to me. In each case, a "trialogue" (Riessman, 2008, p. 48) occurred because myself, the family, and Salvador all participated in the interview, where although I formed the foundation of questions, Salvador was the one who set the stage and directed the path the interview took (Riessman, 2008).

I conducted semi-structured interviews with community members who participate in the garden cluster, allowing me to collect data on who they were, what they did, and reasons behind their participation in the cluster (Patton, 2002)(See Appendix L). I used semi-structured interviews with the teacher and student teacher to understand why the vegetable cluster was started and information pertaining to how they perceived the students' learning experience, as well as to understand contextual information about the classroom, children, and their observations of the experience (Patton, 2002)(See Appendices J & K).

Weekly Letters. I used weekly letters "to create a climate of warmth and safety by building trusting relationships among teacher and students" (Davis & Yang, 2005, p. 34). I hoped that parents could work with their children in the garden at home and at school (Vopat, 1994). But, if they did not know what we talked about, then why would they? The weekly letters allowed me to create a link between the classroom experience and their homes (See Appendix M). I sent home the letters every Thursday with the students and provided a brief summary of what occurred in the cluster meeting the previous week. I asked questions related to the topic that the students discussed and challenged families to provide their opinions, experiences, and other relevant information that may help us in the garden and be participants in the action plan (Kindon, Pain, & Kesby, 2007; Stringer, 2007).

I gave the participating families an herb plant to cultivate with their children. Each was given a potted herb plant that produced quickly so the families were able to see it grow during the 2.5 month period. At the request of families, the plants

were potted to account for space in the families' home. As the plants grew, I used the weekly letters as an outlet for families and students to share the plant's progress.

I used letters to show the possibilities of forming reciprocal relationships between the families and me (González, Moll, & Amanti, 2005). These potential relationships demonstrate the importance of interdependence and the fact that I did not gain knowledge in isolation. In addition, knowledge exchanges occur over time, it can become a catalyst for families to become active participants in their children's inquiry about vegetable gardening (González, Moll, & Amanti, 2005).

By exploring how communities took action, I was able to learn about the funds of knowledge that each of those communities had to share González, Moll, & Amanti, 2005). Through the participatory action component, this research project was a way to involve and collaborate with all the communities in the inquiry process (Goswami, Lewis, Rutherford, & Waff, 2009). An intersection of knowledge occurred as I collaborated with individuals who had knowledge or perspectives different to mine. Particularly in the classroom, Nora brought pedagogical knowledge, while I brought theoretical and practical knowledge about environmental education and vegetable gardening. In addition, what knowledge we did not have, we gained from accessing students' ideas, family ideas, and professional members of the community.

The narrative structure, with beginning, middle, and end is much like the participatory action research structure, in that we have to start somewhere, let our inquiry lead us in a direction, and then eventually to the initial conclusion, thereby leading us back to somewhere near the middle to begin again (Riessman, 2008). For that to happen, reflection will occur in the classroom. When children think about

gardening, their thought processes are jointed, and eventually brought together by thorough discussion of what action should occur. For Nora and I, the act of dialogue was intentional because each of the students' experiences colors the ideas and imaginative thoughts, which they have and then string together with others in a "kaleidoscopic flights of fancy and considerations deliberately employed to establish a conclusion" (Dewey, 1933, p. 5). Because the community was reflective, we could take deliberate action and a commitment to dialogue and participation in the classroom, making the implicit thoughts explicitly spoken language (Dewey, 1933). This was important because it was necessary to muddle through various problem-solving ideas to reach the solution that makes sense in our world.

Analytic Methods

As I used a social constructionist perspective, I interpreted the data. I framed my interpretations by the actions and words of my participants, but it remained subjective (Patton, 2002). Although much more open-ended than quantitative methods might allow, qualitative methods can be more structured to include a "systematic process systematically followed" (Patton, 2002, p. 546). I will maintain dependability by using this structure. As I stated, my interpretation of the data is subjective and my experiences and biases significantly affected the way I chose to represent my participants and present the data. As such, I was consistently reflexive throughout the research process to identify and recognize those biases and explicitly state them (Bentz & Shapiro, 1998; Patton, 2002).

In the analysis phase of this project (which did not occur in isolation), I did not "*find* narratives but instead participate[d] in their creation" (Riessman, 2008, p.

21). Even as an audience reads this, they create their own narrative of the world, perhaps even co-constructing meaning (Riessman, 2008). It is important to look at the details of the narratives in terms of "how and why a particular event is storied, perhaps, or what a narrator accomplishes by developing the story *that* way, and effects on the reader or listener." (Riessman, 2008, p. 13). By focusing on the nuances of stories, I strove to produce thick descriptions (Geertz, 1973).

Due to the participatory nature of this project, as well as the importance of all involved communities, I conferred with participants concerning my interpretations, so they directly informed the research reported by taking part in the writing (McNiff, Lomax, & Whitehead, 2003; Stringer, 2007). I tried to integrate their words verbatim as much as possible. Nora contributed in writing portions of classroom work that took place because we constantly discussed their actions to ensure we stayed on the same page (Mills, 2000). Sometimes we challenged each other to make sense of the data. In this way, various communities continued long after the project itself was completed (Stringer, 2007). As participants, they were a critical community (McNiff, Lomax, & Whitehead, 2003).

I used the constant comparative method to analyze the garden data in an interpretive nature because it enabled me to represent the participants' voices authentically without imposing my own meanings (Charmaz, 2010). Although the process is not absent of my interpretations, I practiced reflexivity in regards to epistemology, methodology, and data collection methods as I tried to make sense of the data (Butler-Kisber, 2010; Charmaz, 2010). I thought about how I looked for interactions through observations and listened for collaborations during interviews.

I recognized this to ensure that my experiences and personal biases did not cloud the types of codes that I identified, particularly to avoid letting my voice become louder than the participant's (Charmaz, 2010). To lessen my influence, I looked for data that also showed non-collaborative instances.

The purpose of using the constant comparative analytic method was to compare within and across data constantly as analysis occurred throughout the course of the project (Butler-Kisber, 2010; Charmaz, 2010). During this process, I engaged with data sources (text, visual, etc.), which enabled me to interact not only with the actual data sources, but also with the participants being inquired about (Charmaz, 2010). I wrote memos to reflect on the codes and themes I recognized, as well as make connections between codes or between data sources (Charmaz, 2010). The memo and constant comparative method helped me develop a descriptive categorizing system based on specific descriptions that eventually became a part of broader conceptual understandings (Butler-Kisber, 2010).

Initially, I examined and explored each data source multiple times to get at what Butler-Kisber (2010) calls the "course-grained phase" (p. 30). This phase of the process also involves using analytic methods such as memos, reflective dialogue, and exploring the data by trying out themes. I began by selecting text or images that stood out to me while reading. I kept a record of the important text and image content so that as I identified codes, I used memos to write about what I was thinking during the process (Butler-Kisber, 2010). As Butler-Kisber (2010) described, this process can be somewhat flexible and provides a framework for understanding the data (Butler-Kisber, 2010).

After initially wading through the data, I entered the "fine grained phase" (Butler-Kisber, 2010, p. 31) to delve deeper, organizing the broad ideas made in the course phase into more specific and nuanced categories. At this point, I began to see relationships that enabled me to make grounded interpretations about the gardening phenomena I was inquiring about (Butler-Kisber, 2010).

This process was reciprocal because my ideas and theme generation were intertwined and informed the other (Charmaz, 2010). Additionally, any iteration of ideas or coding will inform the way I look at the data in the future. I applied the method of constant comparison as I analyze my field notes, interviews, and transcriptions. I compared interactions between participants and utilized this method of analysis to discover the connections between participants so that relationships were as clear as possible in terms of making substantiations based on what I interpreted from them. This process also included thematic analysis.

Thematic Analysis. As I analyzed, I engaged in memo-writing to process the data to further explore what was transpiring among the participants (Butler-Kisber, 2010), and think through the process of analyzing data. This process allowed me to be more transparent because I responded through memos about categories or themes that I saw emerging from the data. Interestingly, memo-writing enabled me to have dialogic encounters internally (reflexive in nature) or with the participants' words (through existing data) to constantly trouble themes or question the assumptions being made (Butler-Kisber, 2010; Charmaz, 2010). The transparent nature addresses issues of voice in research, giving me an identity in the process, which is important to presenting my assumptions and position, or role in the

research (Butler-Kisber, 2010). This gives me control of the analytic process and "increase the analytic power of [my] work" (Charmaz, 2010, p. 6).

I kept memos regularly so I could have a reflexive record of musings throughout the entire analytic process (Butler-Kisber, 2010). This is important because it made me more accountable and aware of my data, and pushed me to confront my thoughts, assumptions, and questions (Charmaz, 2010). Instead of just thinking about those issues, I took the time to write it down, see it, and had the opportunity to go back and look at it continuously.

In the beginning, the memos addressed analytic issues regarding codes within or across data sets, which facilitated my process of thinking about the data, either directly or other sources of inspiration that informed the way I interpreted the data. Through memo-writing, I also further interrogated what the codes, categories, or emerging themes meant (Charmaz, 2010). Because I could question how and what I was interpreting, memo-writing also informed data gathering and analysis that occurred after initial passes at the data.

Through the analytic process, I utilized thick description (Geertz, 1973). In research, thick description is often misconstrued to mean rich detail. However, the thick description that Geertz (1973) described is much more about recognizing the internal and external influences that both affect and are affected by the participants (Agee, 2002). Using this analytic concept, I was able to "break down the generic classifications" (Agee, 2002, p. 582) of the setting or participants and uncover the underlying context to reveal "the symbolic structures and dynamics" (Agee, 2002, p.

569) that facilitated transparency in the setting during the analytic process to ensure that what is represented is not generic, but explicitly unique.

It is important to reveal and understand the culture of environments and people, which encompasses all of "the webs of significance" (Geertz, 1973, p. 5) that branch off in different directions, for different reasons in a setting or person's life. In thick description, the nuances that exist that are important. These are the things that are not apparent at first glance. It takes time and multiple perspectives to differentiate and understand them (Geertz, 1973). Thick description gets under the surface to describe not only what took place, but what it means and how it relates to the phenomenon being studied (Geertz, 1973).

In the classroom, a generic image comes to mind (for readers, researchers, and teachers). The nuances of the environment, and how those involved in it construct that environment, are deeply influenced by what goes on in the classroom. To get at the context it needs to be "thickly described" (Geertz, 1973, p. 14). The "overt structures and artifacts" (Agee, 2002, p. 572) are still surface level aspects of an environment, so Agee (2002) proposed six levels of analysis that enable the researcher to see beyond the bounded walls of the setting, and look to other factors that such as the permeability, movement, variability, histories, cultural representations, and cultural ecology (Agee, 2002).

Hamner (1998) emphasizes the importance of thick description to answer the why questions, not just what. This places the importance on interpreting the setting and behaviors of participants to inform the phenomenon, as well as bringing assumptions to the surface (Agee, 2002; Geertz, 1973). In doing so, I can address

issues of trustworthiness, lending a sense of authenticity to the data and participants' voices (Goldstein, 2007). As I engaged in analysis, I addressed the "*betweeness* where knowledge, analysis, and action emerge between co-researchers and participants" (Kindon, Pain, & Kesby, 2007, p. 29).

Trustworthiness

Rigor is important in qualitative research, and in participatory action research especially to ensure that the research truly does not do research on participants, but instead engages with them as a facilitator (Guba, 1981; Mertler, 2009). For this research study to reach the multiple audiences that might find it useful (administrators, teachers, families, community members, etc.), I committed to addressing rigor in my methods. I also attempted to be transparent as possible in my methods and analysis, and I fundamentally constructed a study that is coherent, both in theory and in practice (Butler-Kisber, 2010).

I did not want to do research because I wanted to tell people what I think, or what I found. I wanted to do research because I wanted to share the voices and experiences of participants within a community (Cochran-Smith & Lytle, 1993; McNiff, Lomax, & Whitehead, 2003). It is important to note that I do not think I can give voice because I am merely inquiring into what participants say. However, I listened, acknowledged, and confirmed my interpretation of their narratives as a way to share their stories with others (Butler-Kisber, 2010). Of course, I used my interpretive lens to organize the knowledge that I gained from participants, but I tried to remain true to their perspectives and voices by using multiple methods of

collecting data, as well as analyzing data using methods that let the meanings emerge from the data (Butler-Kisber, 2010; Guba, 1981)

Issues of trustworthiness were addressed by using credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1986), as well as the above-mentioned tools. Because I spent a semester in the classroom, I was able to provide an in-depth account of the children's experiences with the garden, which will address credibility. Transferability refers to rich data samples, which coincided with the in-depth data collection. To maintain dependability, I constantly compared the data sources, and interviews served as a way to confirm my interpretations of observation data. Along with being reflexive, confirmability was addressed by constantly checking in with my own perceptions and biases to remain as objective in my interpretations as possible (Lincoln & Guba,1986; Patton, 2002).

Credibility. To address credibility in the study, I followed Guba's (1981) suggestions that involve an extended period in the contexts included in the study (Mills, 2000). In doing so, I was able to see and uncover the complexities of the learning process in the classroom. The study occurred over a 9-week period, for one hour a week. Although this was not an extensive period of time in regards to the school year, it is the time frame that I worked with, and I used other methods of data collection to ensure many types were gathered to find and understand the many perspectives represented. I have participated in past garden cluster experiences prior to beginning this study, so I have become an active member of that community. In addition, I visited families numerous times during the study, called them and sent weekly letters.

Through data collection triangulation, I also compared insights across types, which included audio files, artifacts, and interviews (Guba, 1981; Patton, 2002). These data provided additional insight into the funds of knowledge represented by each participant. Due to the nature of the study, member checks were crucial since the participants are really the researchers in the project (Guba, 1981). As I analyze the data, I conferred with the participants to ensure that my interpretations of their actions, words, and work are representative of their experience (Mills, 2000). I used the second interviews with family and teachers as a way to member check the information that occurred in letters, or in the classroom. By reviewing the information with them after the project, I ensured they felt authentically represented (Glesne, 1999).

I also engaged in "peer debriefing" (Mills, 2000, p. 73) with the Nora and research colleagues to share my insights about the emerging meanings from the data. Nora and I constantly dialogued about the garden cluster experience. We discussed our perceptions of the students' learning, as well as how the process of involving family and community members would take place. Before, during, and after the project began, Nora was directly involved in the planning, implementation, and evaluation of my research process. I also met with my advisor consistently to discuss my interpretations. As he combed through the data and we spoke, we made important analytic and thematic decisions (Mills, 2000).

Transferability. This relates to the issue of generalizability (Guba, 1981). Some argue that generalizability is an important part of research. In this case, action research is so context specific, that I would be doing a disservice to the work the

participants did if I tried to generalize their findings (Stringer, 2007). I can provide insight into the process of how they engaged in collaborative learning to seek an active solution to a problem, but I will not seek to broadly generalize that learning process (González, Moll, & Amanti, 2005).

As discussed, I do not seek to generalize the findings from this study because it is context specific. However, I did collect detailed data that provided me with thick description of the experiences the participants had during the study (Guba, 1981). Data triangulation also aids this process because each data type represented a different perspective and context of the study. I cannot say cause and effect, but I can provide insight into the process, particularly in relation to collaborative relationships (McNiff, Lomax, & Whitehead, 2003).

Alternatively, I can provide particularizability (Butler-Kisber, 2010; Patton, 2002; Riessman, 2008), which involves how a study effects the participants and researcher. Particularity also concerns the authentic representation of unique experiences, which leads to deeper understandings (Patton, 2002). In this way, thick description is used to share details and nuances of people, contextual influences, and environments (Butler-Kisber, 2010).

Dependability. This refers to how stable my data were as situations changed and evolved over time (Guba, 1981). I addressed this with the multiple data collection methods as well. While interviewing families, I observed their homes. This action enabled me to develop a better understanding of family funds of knowledge, as well as how they might relate to the classroom. In the classroom, I observed the students, but I also had opportunities to engage with them one-on-one if necessary.

To address this issue, I tried to engage in note taking during and after each cluster, and data gathering experience (Guba, 1981). During the experience, I used the weekly letter to lessen the opportunities to forget how I felt, what I saw, or what happened during any experience.

Confirmability . This refers to the objective nature of the data, or ensuring that what I say about the data is representative of the data and not entirely based in my subjectivities (Guba, 1981). Of course, I will never be able to remove my biases from the process, but I was reflexive to constantly "reveal underlying assumptions or biases" (Mills, 2000, p. 75) that may influence how I interpreted and analyze the data. It is important to note that reflection will never result in neutrality, or the absence of my bias however (Kindon, Pain, & Kesby, 2007). I can also address this through data triangulation to try and ensure that multiple types of data from participants (interviews and observations) are revealing similar things. Additionally, as I wrote, I analyzed (St. Pierre, 1997). I pushed through the data that engulfed me, and I made important realizations about the questions I initially posed. Although I based those questions on my experiences in previous vegetable garden clusters, I never explored the students and families' experiences. To represent the data, I had to make adjustments and show what actually happened.

Ethical Considerations

In qualitative research, there are issues of ethics that I needed to address, particularly due to the amount of detail usually required in accessing participants (Patton, 2002). Because the project took place in a public school setting, I sought and gained permission from the school district's research office, in conjunction with

the Institutional Review Board. To maximize benefits and minimize potential harm, parent permission forms were sent home with all students who signed up to participate in the vegetable garden enrichment cluster.

In this study, the students were vulnerable, and careful attention was paid to ensure that their participation was not harmful. For the students whose parents gave parental permission, I simply described the study and gave an assent form for their signature (See Appendix E). Additionally, because the project is about participatory action, all students in the classroom, regardless of parental permission, were involved in the discussion of their role in the classroom. This included the importance of listening and acknowledging the many voices and ideas to come to a consensus and decide what action needed to occur in the garden.

The participatory action component also enabled the participants to be active in the planning, collection, and analysis of data because they made the decisions (Stringer, 2007). In this way, participants had more freedom and power in deciding what they took part in, and what they did not. Additionally, the fact that I am inquiring into the research process that they experienced to take action, all information is informed by and agreed upon by each participant, ensuring that action was stopped if desired. The project was also conceived with co-researchers and participants, as well as the knowledge gained, so everything is co-constructed (Kindon, Pain, & Kesby, 2007).

CHAPTER 4

FINDINGS

In participatory action research, the process is important (Whyte, 1991). Due to the dynamic nature of the project, this document represents the evolving process of children working together in a school vegetable garden. As the researcher, my role is to share the narrative that occurred in and outside of the classroom as different communities of stakeholders worked together to investigate, make discoveries, and solve problems collectively (Stringer, 2007). One aspect of participatory action research that is important to address is reflexivity. The students and participants did this multiple times, either through direct involvement in the classroom or interviews. In this document, I can thoughtfully and carefully reflect on the experience and provide data driven suggestions for future stakeholder groups who might explore learning opportunities in the garden.

I am using funds of knowledge (González, Moll, & Amanti, 2005) as a way to represent the knowledge and experiences that teachers, students, families, and community members absorb, engage with, and share with others. In other words, what do they do every day that impacts who they are and how they interact with others? Sometimes, the sharing process can be discrete because we unconsciously exhibit our knowledge that comes from years of living our lives. At other times, the source of knowledge is explicit and occurs through interactions with others, particularly knowledge that is co-constructed through dialogue (Rogoff, 2003).

As I sifted through the data and searched for meaning within the multiple texts and participative experiences, I dialogued with the data and myself to question my ideas (Butler-Kisber, 2010; Charmaz, 2010). I interacted with the participants through the data, used my theoretical framework as a guide, and initially looked broadly as part of the course-grained phase (Butler-Kisber, 2010). How did the participatory action research unfold in the classroom, at home, and within the community as a dynamic, engaging, and interactive experience? And what funds of knowledge were sourced, discovered, or used as the students navigated their own learning experience in the classroom? I asked these questions to understand how an interactive experience in school occurred, particularly through the historical, social, and cultural influences in and out of the classroom.

Interacting with data allowed me to realize that it was messy and dynamic (Charmaz, 2010). However, the messiness of the process reflects the students' process in the classroom, as well as the family and community members' involvement. The students and participants often wrestled with ideas, stepped back, and thought about what was happening. During the analysis phase of the project, I mirrored their process. As I began the fine-grained phase, I looked for nuances and my initial questions of how and why became intertwined (Butler-Kisber, 2010). Although presented separately, there are elements of each in all representations of the data. As the audience reads, they interact with data as well and make interpretations based on their own experiences (Denzin & Lincoln, 2000). When the audience encounters the messy data, they experience the project authentically and understand the unpredictable nature of the learning that occurred to grow a garden.

“So let’s think back”

Before explaining the details of the learning process that occurred during the vegetable garden cluster, I share a narrative that provides a window into the school garden. The window provides access into the inner-workings of the garden, the students who made it their mission to grow food, the teachers who guided them, and the communities that provided valuable resources. The time set aside for the vegetable garden cluster was small. In reality, the students only had 9 hours together to take action. As part of their action plan, they had limited amounts of time to identify problems and select the ones they would tackle. Then, they had to plan how to solve them, evaluate their plan, and execute the one most suitable for reaching their goals. Throughout the action process, evaluation was a key component. They had to evaluate their own ideas, as well as those of their classmates, and in doing so, they formed a community that was collectively learning how to grow a garden.

At the end of the learning process, the school provided an outlet for the students to share not only what they had done, but also continue to provide ways food could be grown. At the conclusion of each round of cluster periods, a cluster fair is held and students, families, and community stakeholders can explore what each group has accomplished. Mrs. Carnes explained this to the students, “we’re going to spend some time thinking about what we want to tell our families about what we’ve done in clusters.” The students nodded and she continued, “Some of you are going to check on the garden…, some of you will help Ms. Welch wheel the greenhouse down the hallway…, and some of you are going to stay with me and

draw pictures…to show what we've done." "Can we put *our* names so people know?" Manuel asked, emphasizing the need for everyone's name to be present. This request was met with a "yes," so we continued planning.

"So let's think back to the beginning. What was our problem, what did we want to do?" After the question was posed, the students thought silently for a moment. Then, Chloe replied, "We had a bunch of problems…we were doing the garden to help." Manuel continued, "we needed the worms, the greenhouse, and the soil…oh, the water and plants, and planting seeds." Mrs. Carnes recorded each of their responses on the poster, "and here is a place for future solutions." "Irrigation," Chloe said. "Fencing," Manuel provided. To bring it full circle, Chloe said, "And share the food with whole school, not just the lunch ladies."

During a previous cluster, students from the local university helped the students build a scarecrow. Unfortunately, the students noticed immediately that his head was loose, his hat was missing, and his clothes were tattered. As they discussed how to repair him, Chloe randomly asked, "How are we going to keep the birds out of there?" Without missing a beat, she answered her own question, "the scarecrow!" This posed a question, "is the scarecrow working?" "No," they replied. After weeks of repair, the scarecrow continued to show signs of distress, and the final straw was when his head fell completely off and disappeared. "Do we have to make it work," I continued. "No," they replied. "Is it okay to take it away for now, we'll keep his clothes inside, and we can put it on the future ideas so other students can work on it later?" "Yes!" they all exclaimed. Their work on the scarecrow is one representation of how they planned, took action, evaluated, and decided to alter their plan.

When we mentioned that we had seedlings left, the students took different stances about what to do with them. “Do you want to give those away to people tonight?” Students said yes and no, so we conducted a vote. With their eyes closed, they raised their hands to show support for giving them away versus another option. “There were 6 people that said they wanted to give them away and 5 said they wanted to do something else. What were some of your ideas?” Mason replied, “I was going to put them in the store for people to buy them. We could get some money for charity.” Ms. Welch challenged him, “don’t you think it would be cool to give it to them because it would help them out?” He nodded and agreed that he was changing his vote. “We could plant them in the garden,” Chloe suggested, while Rose “was thinking we can keep them in and we can let them grow.”

Curious, I asked, “Do you want to plant them in the garden because we just have a few beds with plants?” “Yes,” they replied. “Do you think we could add a future solution to get more seeds to plant more?” Thoughtfully, Chloe said, “I was thinking we could fill it in with those so the garden would look pretty for the next cluster.” Understanding the fact that it was not only their garden, Manuel said, “Maybe they won’t think like we did.” This connection represents the students’ transition from “I” to “we” in the classroom, truly forming a community.

Thinking of a way to remain true to the students’ ideas, Mrs. Carnes offered a compromise. “Would it be okay to take that flat of vegetables, and the group with Mrs. Melissa plants some in the garden, and the rest of them go to the cluster fair to be given away?” As all the students said yes, we jumped into action. Ms. Welch helped a group of students haul the greenhouse and pots down the hallway. They

also decided to display the worm bin, as well as the flier and poster they had worked so hard on to show all they had done. They carefully placed the remaining seedlings into zip top bags so cluster fair participants could easily take them home to plant in their own gardens.

My group went outside to plant our remaining seedlings, and they carefully planned which seedlings should be planted in certain garden beds, to fulfill Chloe's wish to make the garden look pretty. As we planted, we all peered down at a growing broccoli plant, and I explained, "Right here, this is where the broccoli will form." As we worked in the garden, another group worked together on our poster, filling it in with pictures that represented the words Mrs. Carnes recorded. "I'm going to build the city, like where the community is. I'll put a mailbox next to the letters we got." They talked to each other about their buildings, whether it would be tall, and with how many windows.

As we made our final goodbyes, Mrs. Carnes said, "This tells me that tonight at cluster fair, I don't need to be there." Listening to the students share all they had done made it clear that they could share the information without any assistance from us. She continued, "It's very obvious to us why we did this." Mrs. Carnes asked, "Who did we want to talk to at first about this healthy food?" "The principal," Mason said. Manuel continued, "The community." "The principal is in our community," Mrs. Carnes noted. The others spoke up, "our teachers" "everyone, mom, dad, family." "Right," Mrs. Carnes said, "share with family and community." Not to be forgotten, one student said, "our friends." "There's going to be a lot of people," Manuel stated. "You're right," Mrs. Carnes said, "it's a good place to share."

During cluster fair, Mason remained at the table with Ms. Welch and me, and made sure that all the people who passed by received a flier, as well as invitation to view the worms and the garden. As people peered into the worm bin, Mason explained, “we planted worms…they help the soil.” With a grin across his face, he asked them, “You want to go outside and see the plants?” As he paraded people outside, he showed them the various garden elements. “This is broccoli, it grows big.” He continued through the garden, pointing out the herbs. “That’s our compost bin.” He turned towards the opposite wall, “we made this in kindergarten, and it had beans on it. This was all beans,” pointing to the bean tee-pee. Although Mason did not participate in the cluster group that built the tee-pee, Arturo told him stories and he saw it outside his classroom window. As we made our way back into the school, he stopped to encourage them to smell the herbs, and once inside, he made sure they took a plant from the table. His excitement was infectious, and no one turned down a tour from him as they passed by the table. As Rose walked up to the table, he even offered to take her and her family. “Mom,” she asked, “You want to see the garden?” As her mother nodded, Rose and Mason both pushed open the door to begin the tour, working as a team to share the garden with her family.

The students learned a lot in the classroom from each other, teachers, and community members. The sharing process facilitated in the classroom enabled them to listen, ask questions, and use that information to make informed action plans and decisions. In the narrative above, many aspects of the learning process are represented. In the following sections, I will show how and what learning occurred in the classroom.

Figure 1. Cluster Fair Poster

How did Learning Occur? *"It has been an adventure for sure."*

To understand what the students learned, it is important to begin with how because it frames the experience. In the very beginning, before we met with each other, the students chose to participate in the cluster because they were interested in the topic. As we met week after week, they formed a community with mutual interests, allowing them to take action together to grow a garden.

Interest-based. - *"I want to make vegetables grow."* This participatory action project took place within the context of an enrichment cluster that enabled students to choose a topic to participate in based on their interests (Renzulli, 1978). As we met each week, Nora and I decided "to be explicit in what the purpose of the cluster was, a child-centered, student driven" project. Before the first cluster meeting, I perused the list of students who selected the vegetable garden cluster, and I noticed

familiar names due to their participation in past vegetable garden clusters. Chloe, an exuberant and strong-willed girl, was involved in the first vegetable garden cluster, so she helped make the initial preparations and first plantings. The other familiar name was Arturo, a quiet and knowledgeable boy who had participated in every vegetable garden cluster for the past 2 years. He often talked about his experiences at home in the garden, and caring for plants was something he always vocalized. I did not recognize the other names on the list, and I eagerly anticipated our first cluster meeting so I could get to know them.

On the first day of our cluster, I waited on the carpet in the front of the room while Mrs. Carnes stood at the entrance to the classroom, greeting the students as they hopped in from the hallway. As they joined me at the circle one-by-one, each sat down quietly, curiously looking around at the new people around them. Ms. Welch, the student teacher also joined us at the carpet after delivering her students to their various cluster classrooms. Once all of the students had arrived, Mrs. Carnes excitedly sat with us, filling in the last gap in the circle. To orient ourselves and welcome new participants, she suggested, "We don't all know each other's name, so we're going to say our name and why we picked this cluster…,so your friends and teachers will learn who you are."

Before going further, it is important to note that Mrs. Carnes's classroom is community oriented and she intentionally chooses her words to reinforce that. The use of *friends* and the fact that it was important to know about everyone was important to the atmosphere of togetherness that would continue to be cultivated. She continued, "My name is Mrs. Carnes and I chose to do this cluster because I'm

not good at gardening, but I want to learn. And I love to grow food and then go out and pick it." The students nodded, smiling. One-by-one, they told us about who they were. "My name is Rose, and I always liked gardening." "My name is Arturo and I picked this cluster because it is fun." Mason, who was in Mrs. Carnes classroom with Arturo, said that he "liked it." As we continued, Dylan said that his "teacher picked it" for him because he could not decide. Even though he did not talk about his interest in gardening, he quickly embraced the idea, perhaps due to the excitement surrounding him as he heard more about why people wanted to be involved. Lupe told her friends that she "likes vegetables," and Maria said, "I like to get the stuff I plant." Finn agreed, "I want to make vegetables grow."

As I listened to their reasons, I became excited. Within the first 5 minutes of meeting, students were already talking about growing and eating vegetables. Because of the way the introduction was posed, "say your name and why you chose the garden cluster,"I expected to hear the word *I* as they each described individually why they chose the vegetable garden. However, as we moved around the circle, that changed. Chloe said, "I like gardening, and I love the teachers." When I spoke to Sharon following the first meeting, she described how excited Chloe was to be in Mrs. Carnes' cluster again, another driving force to maintain her interest. Chloe also told her friends that, "my mom was telling me about her family. She's been to a farm before, and I've planted vegetables." Already, she was making connections between what she had done with her family and what could happen at school. Manuel continued, "I like gardening with my mom, brother, and dad." Mrs. Carnes asked, "so your family gardens?" As Manuel nodded his head with a huge smile spread across

his face, I knew that there were great things ahead for the garden, and Mrs. Carnes agreed, “I think this is going to be the best cluster ever, you’re so excited!”

As a community. *“I to We” Every* Thursday began the same way in the cluster classroom. Mrs. Carnes greeted excited students at the door, and I calmed them at the carpet. Then, to continue our conversations from the previous week, we reminded our friends of our name and said a fruit or a vegetable that we had eaten. Initially, Mrs. Carnes used this technique to focus students on the work we were doing with plants, helping the students make the connection between our cluster and something they had eaten. Each week, the students listened as their friends talked about eating watermelon, tomatoes, broccoli, squash, blueberries, and many others. Sometimes, they reacted by saying, “those are my favorites” or “yummy.”

As part of our time, the students planned together. Each student listened to the other and helped extend their ideas further. As we planned our garden, Finn said he wanted “to make the vegetables grow with the rain.” We had not yet utilized the rain barrels that had taken up space in the garden for the past year, but Chloe noticed them. “When you said the barrels, you can catch the rain and put a hole in the bottom with a tube, so when it’s filled, one tube can go to one plant, and the other tube can go to another plant.” As Finn shared his desire to provide water for the plants, it triggered a thought for Chloe that represents the process that the students went through each cluster.

When I interviewed Ms. Welch at the end of the project, she agreed that each time we met, ”it truly was a discussion based kind of environment.” This reflects the participatory nature of action research. As the problem of water was identified and

they talked about how to resolve it, more students contributed ideas, and they had to reflect and decide on a course of action. To continue the discussion, Manuel said, "put a little room on top, but have holes on top so it can get water." Shaking her head, Chloe said, "No, that is different." Mrs. Carnes took the opportunity to emphasize respect in the classroom. "We have different ideas," she replied. Understanding that there are different methods of doing things was an important realization, and one the students made together. Independent action did not occur, and we always helped each other accomplish our goals and learn.

From to time-to-time, the students had time to write or draw about their ideas for the garden. Often, they helped each other. "I need help," Finn said, frustrated. "I can help you, I can help him," Rose said. While learning how to stir compost, Chloe exclaimed, "teamwork, it's the best" as she and Lupe worked together to turn it over. Throughout our time, Mrs. Carnes reinforced how important they were to each other. "If you're not helping your friends learn by listening and by doing your best, then you wouldn't get to go the garden." "We want the vegetables to grow," Finn said. "Who's going to plant them?" Mrs. Carnes looked at the students, and they all replied, "We are." From that point on, they took their jobs very seriously, listening to their classroom community. They also noticed when friends were missing. "Chloe isn't here…she must have gone home," a student said. Mason lifted his head and put his finger under his chin, "I was just going to ask that."

As our time together progressed and we reached the last cluster meeting, their introductions had changed. Mrs. Carnes said, "When we first started clusters, a lot of you didn't know each other and you would say, I did this, I did that, I ate this,

but I just noticed that all of you just said we, we built the greenhouse, we planted. Because you're not just one person doing this, you had to work together as a team, that's really cool that you've become that kind of team." The language they used had shifted. It was no longer "I," but "we" that they used to describe their accomplishments. This simple language change reflects the relationships that they formed while taking action in the garden to make the garden grow and share good food with people, people they included in their community.

During the final interview, Ms. Welch thought about their community, and said, "from the beginning, they didn't really have a goal, but as we started working, we were checking things off our list and building this garden, and they had a purpose, and I think that's what created their sense of community." By doing this together she explained, "they had a common goal…they were ready to listen and talk more because they saw that the end result was to make the garden."

As the students changed the way they spoke about the garden, they also addressed one of their goals of sharing good food with people. "The other thing you said you wanted do was make fliers that we could have printed up and hand out at cluster fair so they know about our garden. What do you want to share about the garden?" Around the circle we went, "how much water they need," said Manuel. "The sun," Rose offered. As if to say wait, Manuel said, "can we take a picture of the garden because they're not going to know what it is." "What a great idea," Mrs. Carnes said, while the other students nodded in agreement. "Why is it important," Mrs. Carnes pondered. After a moment, "our garden will grow food."

This set off a flurry of ideas from Manuel about farmers and seeds. “So in the flier, you could say something about seed saving so they could use the seeds from the garden and not buy seeds next year.” The idea of connecting our garden to others in the community was an important one for Manuel, and showed his growth. Additionally, as they flipped through local magazines for ideas, it was evident they were making connections between what we were doing in our garden, and what others were working on in the surrounding areas. They selected images of things they enjoyed and wanted to share.

As they worked on the fliers, Mrs. Carnes said, “the one we like the best, we’ll print it out and hand it out at cluster fair.” However, once their individual work was completed, they could not decide on the best one. To compromise, they decided that they would piece their work together like a puzzle to share the garden with people. (See Appendix N) This idea represents the community that formed in the classroom, with thoughtful students who cared about each other and their ideas. One day as we were planning, Finn exclaimed, “we plant vegetables.” “So you’re saying,” said Mrs. Carnes, “we take action, we actually do something.”And we listen to each other, friends, and teachers.” In unison, the students nodded their heads as they acknowledged how important listening to each other was, especially when taking action in the garden.

Experientially. *“The second they walk in the door, I feel like the action starts”* The enrichment cluster model is not only meant to provide students interest-based opportunities, but also opportunities to learn through experiences (Renzulli, 1978). I conceptualized the experience in the classroom through a participatory action

model (Stringer, 2007). In our vegetable garden cluster, the goal was for the students to make all of the decisions and proceed as they saw necessary. If they needed guidance, teachers were there to provide support, but the students still worked together to find a resolution. As Nora explained during an interview, "I think the action does start with them planning, thinking, coloring the pictures, taking their clipboards in to the garden and writing down the work that needs to be done. Then us taking those ideas and honing them, going forward from that point."

During the first cluster meeting, we talked about how they were my researchers. "I'm just learning what you learn about…,but the most important part is that you guys do what you want to do, right?" When they all said "yeah," I was even more excited because that was their first step in understanding that it was their garden. To make sure they knew, we read our cluster fuzzy. "We have a garden and we need your help. For the garden to keep growing, let's go look at our garden and see what can be done." This fuzzy, or identified problem, presented a broad scenario to the students, which enabled them to take the next step in deciding what they could do. Mrs. Carnes explained, "We have markers and clipboards for every person. You're writing down what you think needs to happen in the garden. If you think we need vegetables or a scarecrow, then write that down. If you think of something else, then do that. We're going to put all of your ideas together and solve the problem of the garden not growing right now." As the students held their clipboards, they ventured out into the garden.

As soon as we arrived, Mason said, "we need help with the garden, it needs to be cleaned." Each student began taking notes of what they thought could be done,

when we were all startled by Mrs. Carnes excited screaming. “Oh my gosh, look!” As we all surrounded her, students began shouting too, “we have vegetables!” Chloe said, “We can let it grow and then eat it!” The vegetables were very exciting because the previous week, everything had been covered in snow. They became our miracle plants that the students thought about how to nurture. When we returned to the room, Manuel immediately shared his thoughts, “we could put one of those things with plastic and you cover them, and you put this little thing that warms the plants up.” As Manuel spoke, everyone listened, and Mrs. Carnes explained that we had tried that once before very unsuccessfully. He was designated as “our greenhouse expert.”

Chloe heard greenhouse and knew that “we need to make sure the sun comes everyday and keep the plants warm.” Making the connection between their ideas, Mrs. Carnes asked the students to expand what they were thinking. Then, Manuel entered the conversation, “like a house that has holes on top.” As she recorded their ideas on the board, Mrs. Carnes explained, “I’m putting yours next to Manuel’s because he’s talking about a greenhouse too, he just didn’t use that word.” Student after student began voicing their ideas and Chloe noticed that they could learn from each other. “Like I did one, and he piggy backed off mine, so I piggy backed off of his.” The idea that learning was occurring collectively represents not only the community that was forming in the classroom, but also the importance of listening and acknowledging the many ideas each student contributed.

Planning the garden was an important part of the students’ action, and the first visit allowed them to explore it first-hand, using their fingers to sift through the

dirt that didn't "look like the darker stuff." Chloe realized that "maybe we can call someone to help us." This was one of many times that the students declared their desire to include other people in their garden. And, they also said how much they wanted vegetables to be a part of their garden. As we asked them what else they wanted to do, Mason said, "I'm thinking we need to plant a garden," and Manuel added, "With more vegetables." The garden was already theirs.

The planning process continued throughout our time together. "What are some of the things that the garden doesn't have that you want?" In turn, each student requested something. "I want to plant something," Mason declared and Rose suggested "blueberries." "Do blueberries grow right now?" Mrs. Carnes asked. We were about to find out. Through these types of hands-on experiences, Ms. Welch explained, "I think they were genuinely excited that we were doing this and every week it wasn't just like, we're going to talk about this vegetable today, or something, we actually did it." In addition, Nora felt that "leads to a lot of their action, I think what leads to that are those moments of disequilibrium where they find themselves kind of arguing with us almost." By providing a safe space for them to challenge each other's ideas, they were able to move forward with a plan that included everyone.

The initial interest the students had in gardening instantly created connections between them in the classroom. Although they had different reasons for choosing the vegetable garden cluster, the common goal of growing food was present. Through the experiences they had in the garden and in the classroom with each other, a community was formed. As they interacted, they challenged each other to expand their ideas and work together. The experience of this, as well as the

hands-on experiences in the garden reinforced the sense of community and enabled them to teach and learn from one another.

What did the students learn?

Regionality. School gardens are used in many ways and can represent many different opportunities for students (Malone & Tranter, 2003; Nimmo & Hallett, 2008). The regional location of the garden is important because it defines the parameters for what can be grown, as well as how. The location of the community can also influence the availability of produce. Whether a community is rural, urban, rich, or poor is an important aspect as well. All of these factors impact the types of produce available from both local and big-box stores.

To introduce the concept of region specific produce to the students, we decided to let them conduct a taste test. Ms. Welch pulled up Google Earth on the smart board, while Mrs. Carnes asked, "What is this picture of?" "The world!" they exclaimed. "We're going to fly ourselves from way out to where we live. Ms. Welch, can you type in our city? Now watch what's going to happen." As the plane flew to our city, Chloe said, "wow." "We live somewhere around here; where do you think most of your vegetables and fruits come from?"

The students did not take much time. Immediately, Manuel said, "the farm." Her brows turned up, Mrs. Carnes followed up, "from farms here, in our city?" "Yeah," he replied. Suddenly, Finn chimed in, "blueberries come way far away." "Yeah," Mrs. Carnes agreed, "it's too cold for blueberries to grow right now, but we can still get them in the grocery stores, and they were driven here in a truck. Is that where vegetables grow?" All of the students shook their heads no, so we continued.

"Mrs. Melissa, where do blueberries grow right now?" I looked down at the package of blueberries I purchased from the store. "Chile," I said. "Chile! Where is that?" All of the students looked to the map. "It's a country called Chile, watch." Their heads went from one side of the map to the other as they watched the plane flying from Chile to the Southeastern portion of the United States. "That's a *long* truck drive," Chloe said. Everyone smiled, and I thought about the complexity of her statement.

She continued to think about it when Mrs. Carnes posed a question; "If you were to predict, which would taste better, from here or from Chile?" Chloe quickly said, "Here." "Why?" Mrs. Carnes asked. "Because it's not a long truck drive and you don't have to go through them to see what's good and bad. From here, it's a short drive, but from Chile it's really long," Chloe fervently explained. To the students, it was logical that if items traveled shorter distances, they should taste better. Some were still stuck on the truck. Manuel said, "They're inside the truck for a long time. They don't have water." Suddenly, other students thought about the other missing resources, like light, fresh air, and "soil, it helps the plant grow," Dylan finished.

It was now important that they get to experience first-hand what they had just discussed. "Maybe we can test our theory that it tastes better here. Ms. Melissa has brought in blueberries, lettuce, tomatoes, lettuce, and carrots. So we're going to try some from here and some from far away. You tell us what you like best and we'll put tally marks. Slowly, the students tried each of the items, encouraging each other, "it's good, try it." Not only was this a way to talk about where food is grown, but it introduced some items, like purple lettuce to students who had not tried it before. Although the lettuce was overwhelmingly spit out, the other food items were

devoured, particularly the blueberries that Chloe deemed as “pure gold.” And even though Mason did not enjoy the raw spinach, he thought that “we could make a soup out of this.” He made a connection between the food he was trying and other ways he could enjoy it.

As each item was tasted, we recorded the number of students who liked the local and store-bought produce. Mrs. Carnes counted off “6 people liked local lettuce, 2 liked far away, 8 liked local carrots, 2 far away, 9 liked local blueberries, and 5 liked local tomatoes, and 2 liked far away.” As we looked at our tally marks, she asked, “what does that tell you?” “Everybody likes food from here” they shouted all at once. “So, I think that tells us something. Do we want to tell our friends to get carrots from the grocery store?” “No,” they said, “from here.”

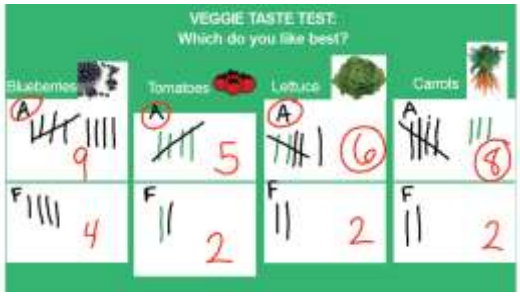

Figure 2. Taste Test Voting

In the beginning, it was important to let the students explore, experientially in the garden and thoughtfully with each other in the classroom. As they observed and listened, they recognized that we needed plants and that it was cold. Because they already decided that they wanted to grow food and share it with others, they needed to determine what they could plant.

Seasonality. It is difficult to plan school gardens because of the time-line they require. In most cases, the harvesting of fruits and vegetables occurs after the

students have left for the summer (Joshi, Azuma, & Feenstra, 2008; The National Farm, 2004). In past cluster experiences, Mrs. Carnes and I learned that it was still crucial that the students decide what they wanted to plant; it would just take some extra planning on our part. Because our goals are the same, we decided to introduce the topic of seasonality with the students by simultaneously learning more about what they knew. "We're going to play a game. These cards have pictures of fruits and vegetables on them. Your job is to figure out when these vegetables grow. Some grow in the winter, fall, spring, and summer. It's warm in the summer. What happens in fall?" All of the students chimed in, "the leaves fall." "What happens in the winter?" "It gets cold," they all replied. Following through, she asked, "What season is it right now?" "Winter," they exclaimed excitedly. "Do you know anything about vegetables that grow right now?" This time as they thought, Chloe raised her hand. "There aren't very many because it's cold."

The lack of growth that Chloe mentioned stayed with the students as they divided into groups and moved to the back tables. They gathered around the tables and the games began. From table to table, the students decided which season the fruit or vegetable they were shown could be planted. Carrots, strawberries, broccoli, watermelon, squash, greens, blueberries, potatoes, lettuce, cucumbers, and radishes all garnered a spring/summer response. They were less sure about pole beans and onions, selected every season as possibilities. At my table, I noticed something. "We don't have anything in the fall/winter, what happened?" They looked around and decided to leave their answers the same. As we looked to the back of the pictures for our answers, we talked about why some were in the wrong category. "Lettuce is

actually something that can be planted in the fall. This is a winter plant." Dylan looked puzzled, "in the fall and winter?" His friends agreed that it was strange, but we continued. As we went through their piles, almost all were in the right place. "Greens, this one is tricky because you can do greens in the fall and winter too. Cabbage, we put it in spring, but we can grow that now." Once our vegetables and fruits were placed in the right season, we talked about why. "Why do you think these plants grow in the spring and summer?" They thought, "Well, it gets warmer in the spring." At that moment, I saw their eyes sparkle as if they understood. However, as he left that first day, Finn said, "but I see strawberries and blueberries in the store, why can't we plant them now?" At this moment, we knew he was thinking critically and making connections that would help us learn.

To continue the discussion, Mrs. Carnes showed the students a growing calendar from a local non-profit group. "This is a garden calendar of what we can plant in January and February. So in February, what can you plant?" Finn replied, "Well, some of the fruits and vegetables like to grow in the snow." "Which ones?" Mrs. Carnes asked, to which he said, "cabbage." "And, you can plant beets, carrots, collards, mustard greens, English peas, radishes, spinach, and turnips. Did any of those things sound like something you'd like to grow?" The students thought about her question, and Arturo said, "We can't plant watermelon?" I chimed in, "but you can plant anything green." Confused, Arturo said, "like watermelon?" "Well," I said, "that's green on the inside, but you can plant something leafy."

As the students learned about what they could plant, they also learned what they needed to do to take action in the garden. After visiting the garden, they knew it

would not be so easy. They talked to us and to each other, learning about the necessary elements needed to make a garden grow.

Plant Resources. When the students said they wanted to plant vegetables, Arturo let us know that "we don't need to get seeds because we have got already the seeds right here." He continued to tell his friends that "these are seeds, and we opened the pods and got all of them out." Because of his participation in past vegetable garden clusters, he knew that they had collected bean seeds from a plant. To prepare for the garden, we listened to their ideas and bought seed trays for them.

The students sat at tables and observed the soil pellets. "This is a seed starter, it's made out of soil, we pull back this part and put the seed in. But feel this, is it hard or soft?" "Hard," they said. "Do you think a plant would grow in that?" "No." "So what do you think will happen when I put water on it?, Mrs. Carnes asked. "It's going to grow." As she poured the water in the tray, Finn noticed, "It's turning different colors. It's drinking the water so it can be soft, not hard anymore."

While the pellets soaked up the water, they gathered their seeds. Mrs. Carnes named them, "broccoli, radishes, jalapeno peppers, spinach, swiss chard, cabbage, and turnips." With their seeds in the palm of their hands, Mrs. Carnes told them, "we're going to pull the mesh back because we want to have the plant there and we kind of push a little bit," using her pointer finger to gently make a small hole in the center. "Then we take a couple seeds and put them in and cover them up so you can't see them anymore." Curious, Manuel asked, "Are all of them going to grow?" "Well," she explained, "sometimes seeds don't grow, so if one doesn't grow, the other

hopefully will." Nodding, they began placing seeds into the pellets. "My hands are getting dirty!" Rose said happily.

With dirty hands, they continued planting the seeds, paying close attention to what vegetable was planted where so we could identify it by row in the seed starter flat. Once the seeds were secured in their new home, I asked, "Where do we need to put them?" Chloe quickly said, "By the window so it can have light." Knowing they needed water, Arturo asked, "Who's going to water them? Me, I want to, I want to water them." At first, some of the students were hesitant, but we explained that Arturo stayed in this classroom all day. "If he's watering our plants every day, then that's really cool because he's helping our plants grow," Ms. Welch explained.

The students decided it was a good plan, but one student asked, "So when are they gonna grow?" "It will take some time, but you should see something next cluster," Mrs. Carnes replied. He continued, "Who makes them grow?" His friends helped, "nature, sun, water, soil." Finn responded, "So that's how we grow them," very matter of fact, "We could actually put some little seeds in there so every single vegetable could grow." "With water," Lupe said.

Water was a commonly discussed issue in our garden, and something they were keenly aware that was needed after caring for the seedlings. As they built a knowledge base from their discussions, they began to explore our water problem more. Because the water access was limited, even to teachers, I asked, "Where can we get it?" Mason replied, "We can get the water, we can have a bag and then we can go to the water fountain and get the bag under it and fill it up and then pour it in, and then do it again for the next plant." Nodding his head hesitantly, Arturo added,

"we can use this hose that goes in the dirt, and you just have to turn it on and water comes out of the holes." Mrs. Carnes smiled, "that's called irrigation." Around the circle, all of the students nodded, showing support for the ideas they heard. "If we put holes in the greenhouse, and put the hose in those holes" Lupe asked, seeking support. "Yeah," all of her classmates agreed. "We might end up taking all of your ideas and then Ms. Welch, Ms. Melissa, and I might organize it for jobs next time." Quizzically, Arturo said, "That's all of ours?" responding to the grouping of ideas about irrigation that Mrs. Carnes put on the board. "Yep, all your ideas," she said. They realized again that they were in control.

Each week, the students immediately checked on their growing seedlings by the window. They watched as the stem grew and leaves formed, noticing that some had not sprouted. "The swiss chard is doing well," someone noticed. "And look at the jalapenos, is it doing much?" "No," they replied. "You said you wanted a greenhouse," she said. "We decided not a greenhouse," Chloe told her, "it's small, but we could put the plants in the garden and put a plastic cover on it with holes so they are warm, and we can put a bigger one on it when the plants get bigger." Rose agreed, "We need a plastic cover." We continued the discussion about a greenhouse and how to keep the plants warm. Manuel suggested, "Like a house that has holes on top." That day they did not make a concrete decision, but decided to keep thinking about it. In the meantime, Mrs. Carnes and I looked each other, knowing how much work was in store. That evening, Nora and I shopped for supplies and stumbled upon an easy-to-build greenhouse. Although it was not exactly what the students discussed, we thought it would work.

During the following cluster period, they were not surprised when a greenhouse box showed up in the classroom. With the metal pieces strewn across the floor, the students organized themselves and carefully worked together to build it. In a matter of 10 minutes, they had constructed the greenhouse with my help. “This is awesome,” Arturo said. “Can I put this on now?” Mason asked about the plastic cover. “How are we supposed to put it on?” Arturo asked him, noting how tall the structure was. As I heard “I want to help, I want to help,” coming from each student, Ms. Welch and I helped them lift it up and pull it down. “We got it,” Mason said, “We built a greenhouse.”

After a few weeks of carefully watching their seedlings, Mrs. Carnes asked, “but, what could we do with these plants next?” Students began giving their ideas, and while some thought they should go outside, others did not like that idea, so Mrs. Carnes asked them to think about it more. “You said we should put these outside, but it’s been cold at night. We could take these out of here and put them in the greenhouse. Arturo and Mason can bring them in before school is over so they can get plenty of sunlight during the day outside.”

Building on their knowledge from previous sessions, the students observed that the plants were ready for the garden. They realized they needed to prepare the soil, so we trekked outside, shovels in hand to begin the process of readying the plant beds. “Can I spread it out?” Manuel asked. “Yes,” I said, while Ms. Welch showed him, “look, go deep with the shovel and then pick it up and flip it over.” Through hands-on experience, the students learned how to prepare the soil for

planting by mixing the compost with the red clay to ensure the nutrients were distributed.

Once that job was complete, it was time to plant. With the seed starter flat at their feet, little hands were used to give their friends seedlings to plant. “You’re going to make a hole, put the plant in, cover it up so you can still see the green,” I explained. One-by-one, each seedling was carefully placed into the garden beds. Arturo, with all of his experience, showed his friends how to do it. “You need to make a line, see?” as he used the trowel to create a path in the soil for the plants. “Now you make a hole and put it in.” “I learned that sometimes you have to pull weeds before you plant,” Dylan shared.

While planting during another session, the students noticed the silver trashcan and asked why it had holes. We explained that it was a contained compost bin that could hold decomposing matter. During class one day, we played a song for them. “You already talked about compost…number 8 says don’t trash me baby, don’t throw me in the trashcan.” As the students laughed at the name, Mrs. Carnes continued, “it’s talking about you don’t have to throw certain things in the trash, you can put it in the compost bin.” “Like recycling,” one student said. “Yeah, and this food wouldn’t go in the recycling bin, it would go in the silver bin, where the stuff is where we make the soil.”

A few weeks later, Arturo carried the box of flower bulbs to our circle and opened it. “Ew, it’s smelly,” the students exclaimed. “It’s rotting.” Mrs. Carnes asked, “If they’re going bad, where can we put them?” Arturo responded, “In the big silver container.” “Should the bag go in the compost?” she asked. “No, but maybe we can

reuse them," Manuel suggested. I asked, "Can we just leave them there?" "No, we have to stir it up." They learned this when they stirred up our bigger compost pile, noticing the darker soil underneath all of the dead plants. As I showed them, Chloe said, "I understand now, I think we need to crush it a little too."

During the last cluster meeting, it was important for us to know what the students enjoyed most. As we went around the circle for the last time, Manuel and Chloe both said, "everything," while Manuel, Mason, and Mrs. Carnes said, "the worms" or "compost for the worms." Even Dylan, the student whose teacher chose his cluster for him, and who was not initially excited about his placement, said that planting "broccoli" was his favorite part, a sentiment mirrored by his friends. When it was Lupe's turn, she said "I liked when we took the plants home," which prompted another student, "I saw in my room, in my window, that my mom was planting some garden, I ate some." Mrs. Carnes took this cue from here, "is one of your favorite parts that we can bring our families into our clusters and you think about what you do at home with plants?" She nodded her head, with a smile from ear to ear.

We asked the students to assess their work, "Let's look at what we've done," Mrs. Carnes said as she looked towards our planning chart. "You said you wanted to plant seeds, check, we did that. You said you wanted to plant them again in bigger pots; you did that when I was gone. Check, you put them at your house. And you built a greenhouse. You said you wanted to fix the scarecrow, we still need to think about that." As soon as she said it, Dylan said, "I think he died." Making decisions about what to do after they took action to complete something was an important step so they could evaluate the effectiveness.

The students' evaluation of their actions enabled them to engage each other in discussion. As they shared their ideas about regionality, seasonality, and plant resources, they learned not only from the experience, but from one another as well. As their shared their own funds of knowledge, they realized they needed more help. They knew that Mrs. Carnes, Ms. Welch, and I were there to support them, but they needed more because we did not have all the answers.

During our time in the classroom, some students shared family gardening experiences to help us find solutions. While talking about irrigation, Arturo talked about using a hose with holes, which we did not have. While planting in the garden, Arturo showed his friends how to plant seeds, and Devin mentioned learning how to pull weeds. Because these were techniques we had not discussed, they were coming from somewhere in the community. As our time progressed, the students recognized that we needed more help than the shared ideas from students, so they asked for additional family and community help through letters. By asking family and community members for their knowledge, they were sourcing more funds that could help them grow the garden. Looking within their communities, and asking those with expertise in needed areas establishes or maintains relevant connections between school garden experiences and those happening elsewhere in the community (González, Moll, & Amanti, 2005). Identifying communities that provide relevant funds of knowledge can be challenging, but we used the students' guidance to support our search. Our searches for funds of knowledge to help us grow the garden are presented in the next section.

Accessing Funds of knowledge "*We need help…"*

As I synthesized my past cluster experiences, talked to educators, and collaborated with community members, I envisioned a research project that would allow me to follow the students' process as they learned about gardening. As it is entitled, cultivating partnerships can take on many meanings within the context of clusters in terms of partnerships between teachers, students, families, and community members. Family and community involvement was intentionally chosen because I assumed the students would tackle problems that would require outside assistance. I also thought that by providing letters sharing our journey in the classroom, it would allow for knowledge sharing across environments, from both home to school and school to home.

My initial questions guided my open-ended and exploratory inquiry. As invited members, what information would family and community members share; how? Support for school gardens is integral to their success (Joshi, Azuma, & Feenstra, 2008), and an important consideration for those taking on the task. For this project, the participatory nature of action research called for collaboration amongst many groups, both in and out of the school environment. As the students worked on the garden from week to week, community organizations and people provided different resources that helped us take action in the classroom.

It was important to Mrs. Carnes and me that the students initially request help from sources they identified. To enable and encourage students to direct their learning, we wanted to discover the funds of knowledge from their experiences, families, and the community (González, Moll, & Amanti, 2005; Hoffman, Franko,

Thompson, Power, & Stallings, 2009; Subramanium, 2002). As kindergarten, first, and second graders, it can be challenging for them to access the funds of knowledge, particularly in a timeline that is suitable for a 1 hour a week over 9 weeks.

Community resources. One day as the students arrived in the classroom, we excitedly told them about something wonderful that happened. "Let me show you what Chloe has in her hands," Mrs. Carnes told the students as they looked to the small trowel Chloe grasped. "You don't get a shovel and compost for free. You have to have what?" All at once they said, "Money." "Well, Ms. Melissa wrote all the good stuff we do in clusters and gave it to someone who wants to give kids money to help the world." I piped in, "We got $200!" "Whoa!" they shouted. "They also delivered some awesome soil, but it's in a really big pile, so we need put it in our garden beds." With the money came responsibility, but the students were elated to begin putting their "shovels, trowels, and all kinds of things" to good use in the garden.

Before the cluster began, the local chapter of KAB posted a grant opportunity through their social networking site about an opportunity that was available for schools designated as *Green Schools.* The Green School Program was piloted in 2005 through a grant from the state chapter of KAB, and six years later, there are 15 designated Green Schools in the district. This program provides many resources to educators seeking to incorporate lessons that address environmental education in the classroom, encouraging teachers to go outside as well.

Because of their support, we purchased materials for the garden that helped us take action. The students also saw how important community members could be in helping grow school gardens. Before the grant money arrived, the students talked

about their personal experiences gardening, but after they saw what could happen when community members were contacted, they had a new plan.

As they planned, I asked them, "you have a lot of ideas, but do you think we know how to do all of these things?" "Yes," they all replied. Mrs. Carnes and I laughed, "We don't, so do you think we can get other people to help us?" "Yeah." However, as the students spoke, they said they were not sure who to ask. As Manuel volunteered to write letters to community members, they began to brainstorm. "Farmers," one said, followed by Arturo; "the guy who came last time to my home because he knows how to make good things." The man he spoke of was instrumental in constructing a community garden located in Arturo's neighborhood, and continues to be a presence in the community. Because he lived in the same place, Manuel shared, "he has the hoses on the plants and they had to put holes on them and you just turn it on and water comes out of there." As he talked, his friends listened intently. Mrs. Carnes asked, "This is your garden right? And we want to write letters to people to help us. Who could we write to?"

As the students divided into action groups, they wrote letters to family and community members, asking them for guidance and help. As they flipped through local magazines for ideas, it was evident they were making connections between what we were doing in our garden, and what others were working on in the surrounding areas. Although the students did not always provide us with specific organizations or community members to contact, we did ask them if it was okay for us to contact people we thought could help us, ensuring them that we would remain

true to their ideas and goals. I looked in their communities for resources we could access, as well as communities I knew could help.

"We need a lot of worms!" Because the students had expressed interest in having worms to make compost, I delivered their letters to community members and to an agricultural extension agent in our area. On the day she arrived, the students waited anxiously to see the worms. Before exploring the worm's home, we talked about how to build one for our classroom. "We need someone to tear and wet newspaper, to cut mesh with scissors, to glue the mesh on the bin, and we need help with the worms," Angie explained. Even though most of the students raised their hands to be part of the worm crew, they volunteered to do other necessary jobs, as well, because they knew it would help.

After Angie drilled holes into the plastic bin, she guided the students as they found and removed the worms from her bin. "Grab a worm," they all yelled. "He likes you man! Get the dirt, get the dirt!" Mason exclaimed, bringing out dirt with worms and placing it on the lid. At another station, Chloe excitedly stated, "we're making the house, we can do it." They each took turns hot-gluing the mesh that Lupe and Ms. Welch had generously cut for air holes.

At the back of the room, Mrs. Carnes sat on the floor with a group of students, covered to her ears in newspaper. "Can you believe that worms live in a place with wet newspaper and soil?" The students shook their heads in disbelief as they continued to tear it into strips. "Do you know what they do to it?" "What?" "They eat it and make soils, so worms mess around with this stuff, eat it, and poop it out." In utter disbelief, they asked, "how does it work?" "They digest the newspaper," Mrs.

Carnes explained. Still a little unsure, they placed the newspaper strips into the bin and began filling it with water, passing the beaker in assembly fashion.

Once the newspaper was wet, Mason asked, “Are we going to put the worms in there?” Angie nodded yes, and the students carefully placed the worms into the bin. Because Mason did not participate in the digestion discussion, he was confused. Ms. Welch helped, “you saw what was in her bin, what was in there?” Mason replied, “Newspaper and food.” Angie explained, “They eat the newspaper first and make their home and then they eat the other stuff.” Ms. Welch added, “The people who don’t eat their snack can put it in the bin.” Excited, Mason said, “that’s a great idea, I want to do it.” And then, he realized; “we touched worm poop?”

“So when the newspaper is running out because they’ve eaten most of it, what do you need to do?” “Rip up some more and wet it so they can poop it,” Chloe said. Mrs. Carnes asked Angie what the worms could eat, and Mason said, “Vegetables.” “Right,” she said, “but no citrus fruits, they don’t like it.” “So what else should we know,” Mrs. Carnes asked. “The worms don’t like sunlight, they don’t like the light in here, so we have to keep the lid on.” Chloe nodded, “but it has holes for air, so they can breathe.” Angie nodded. “Isn’t that amazing?” Mrs. Carnes asked; “they can take paper and vegetable scraps and turn it into dirt. What would you like to do with it when it’s soil?” “Put it outside!” Manuel asked, “how do the worms help the plants, what do they do to them?” “Worms put air in the soil,” Angie explained, “They spread it out. When they break down leaves and food, they break it down and make soil that has a lot of nutrients.”

During the rest of our cluster meetings, we always brought the worm to our circle so the students could check on it. “The worms are eating the food,” Rose said excitedly. “The worms ate the paper,” one student mentioned, noticing that there was more dirt in the bin than when we started. “They’re doing it, they’re making soil,” Mrs. Carnes said, to which Mason replied, “They’re pooping…thank you red wiggler worms for helping us!”

“What about the worms?” Mason wondered, “I thought we were going to put them in the garden?” “Does anyone remember where these worms like to be?” Mrs. Carnes asked. “They like to be inside,” a student said. “That’s right, they like to be inside making the soil, but we can take the soil out and leave the worms.” “Do you know what it’s called,” I asked. “Compost,” Manuel replied. “Well,” I said, “its worm castings that help make compost. When there’s enough, then what can we do?” “Put it in the garden,” they all said. The students continued talking about the benefits of worms. “They help the garden be well because they like soil and do stuff for the soil,” Mason said. Manuel continued, “They make it softer, like the water,” and Finn concluded, “And when it’s in the ground, it will be great!”

“That’s called irrigation.” “We wrote letters to family and community,” Mrs. Carnes said, and I continued, “And some of them were sent; that’s why we have the video.” Curious looks crossed their faces as they wondered about the video I mentioned. I told them that I showed their letters to friends who work in gardens. During an informal meeting, I discussed the challenges we encountered in the garden. Margie offered to contact the local water conservationist to help us resolve

the water issues. A few weeks later Margie and Claire visited the school garden to identify possible solutions.

Before the video played, the students again evaluated all they had done, and they thought about what did not happen. “We did not build a fence, so that might be something next cluster does, and we did not figure out an irrigation system.” I smiled, “Keep that in mind while you watch the video.” Mrs. Carnes looked at me, “so are you saying that we wrote letters to the community to tell them about our garden, and now they’ve given us ideas on how to water our garden?” “Yes,” I said, “now listen to the video so you can hear the words so you know how to use what they say in the garden.” The students were glued to the screen as the local water conservation expert told them what they could do about the water situation.

> Hello everyone, we have Claire here who is going to help us figure out what to do with our water situation and rain barrels.
>
> I have a couple of ideas, and you’ll probably notice there are a lot of downspouts coming from the gutters and going into the ground, well each one of those carries all the water off the roof, so if we can take one of those and put that water in the rain barrel, over here we can do that, you’d be able to collect a lot of water. You could even put maybe 2 or 3 or 4 together and fill them all up. That would be one way to get water because it’s already going to rain on the roof, so you could tap into that and collect it. Once you have rain barrels set up, each one has a spigot at the bottom, and you turn it and the water comes out and you could hook up a hose and then connect that hose to the beds over here to water the vegetables, or you could connect to a

soaker hose which is a hose full of really tiny holes so the water just slowly comes out so you don't have to spray you won't drown anything, it will just slowly soak into the ground over time. Another idea you can look into to see what would work, would be to look at these tiny buildings over here. There's a brown shed or a blue and green shed and neither has any gutters on it. So if we could put gutters on there, and use that just for our rain water to collect to use in the garden, maybe we would be able to get enough to keep all the plants alive and keep them healthy. That would take getting a couple of gutters and putting the rain barrels up to it.

And we would need to get permission from our school?

Yes, you definitely want to get permission from your school, they have a groundskeeper or a grounds department, those are the people who would probably have to approve it, along with your principal I think, but if you talk to them about what you want to do and why you want to do it, they might be open to the idea. You have a great garden ad you want to keep it healthy and let the plants drink.

Thank you!

After watching the video, I asked, "Has anyone noticed our rain barrels by the water hose?" Their heads nodded yes. "A couple of those barrels don't have a top, and they're sitting upside down. What can we do with those?" In a very matter of fact manner, Manuel said, "turn them around." Struck by the brilliance in this simple statement, Mrs. Carnes said, "I can't believe we didn't think about that." This scenario is an example of the learning that occurred in the classroom because as

teachers, we saw those rain barrels every day for years, and never once thought to turn them over. “Right,” I said, “we can turn them around and they can start collecting water for us, we can just turn the spigot and water can come out.”

“Have you asked the principal?” Manuel inquired; clearly he was paying attention to her suggestions in the video. “We have not asked because that just happened. So, you guys can think about that. We probably can’t install them the way she was talking about, maybe you could write letters to the principal or the groundskeeper. We might have to wait till next cluster, but you guys could make it happen,” I told them. Mrs. Carnes replied, “So, I changed this from what jobs have we completed to what can we still do while we’re meeting. We said we could turn the barrels over to fill with water, and a great idea that Manuel just had was to convince the principal by writing letters to her to that we should be a be to cut one of those spouts to get the rain water to come into it.”

“What did you think about the lady on the video?” Ms. Welch asked, “Isn’t that cool that somebody from the community wants to help us garden?” All of the students said, “Yes.” Our community resources and help led us to new ideas for the garden space, and the students were content to be a part of the planning phase for now. In the meantime, a group of strong boys helped me roll four rain barrels to their new home by the garden atop extra cinder blocks so gravity could do the work of filling them with water. As they looked at the rain barrels in the location they put them in, satisfaction was evident on all of their faces, eager to see what would happen next.

As discussed, water was an important issue the students tried to tackle in the garden. During the planning phase, they shared the methods their families or community members used to ensure the plants received the water they needed to live. The amount of family influence on the students was evident, as it had been in past clusters. Because of this, it was important to access those funds of knowledge that existed in families.

Family funds of knowledge. The knowledge and experiences families had about gardening was evident as the students talked about gardens their families had at home, or used in the community. This occurred particularly when we were trying to solve problems in the garden. Mrs. Carnes always asked, "How do you know that?" Thinking back, Ms. Welch remembered that "you could just tell from their vocabulary that they had a lot of experiences with their families, and this is something families are involved in." Each time, they shared their experiences, we looked at each other in disbelief, knowing that the other was thinking about what remarkable knowledge bases these students had about gardening. In most cases, the students said, "Where we live, we have that."

To provide a way for families to share their expertise or ideas for the garden, I sent home weekly letters that explained what we did in the garden. I integrated questions and space for comments into the narrative describing the cluster meetings. I used the letters to discover what information families would share about gardening and topics related to what the students learned in the classroom. During my interviews with the families, they all initially expected to complete the letters and were excited to begin caring for the herb plants I gave them with their children.

Sharon expressed her excitement, “I just can’t wait for Chloe to come home every week and tell me what she’s learned...I’m sure I’m gonna learn a lot from her.” Discussing cluster activities at home was important because many of the families discussed barriers to their involvement at school. James explained that Maggie “is “at work when he gets off school and then they don’t do anything before school,” and he stays at home with their children. This was a common scenario amongst the families. Karolina and Iris both have young children to care for at home, and find it difficult, if not impossible because of a lack of transportation, to be physically present at the school. Because they said transportation and time constraints made it difficult for them to visit the school during our meeting time, we talked about the letters as a vehicle for knowing what was happening at school and a way for them to be involved. As I sent each letter home, I was eager to learn how their involvement through the letters would influence learning in the classroom.

In the beginning, Mason’s mom expressed that she was “very impressed with this cluster because the students get a chance to see and become a part of healthy project.” In the letters, I asked families why gardens were important in their lives. Francis explained that, “they help feed families.” A similar response came from Manuel’s family, who explained, “Vegetables nourish our health.” Karolina, Arturo’s mom, explained, “Well that is really great that they can plant.”

As the weeks went by, the students were not bringing their letters back to school. Each week, I asked the teachers for returned letters. Most often, they shook their head no. However, almost every week, a letter from Rose’s family waited for me on Nora’s desk. As I sifted through the returned consent forms for student

participation, Rose's name was not present. However, every week that letters were sent home to the entire cluster class, her family kept sending letters back to school with her. Nora told me that she bounded excitedly into the classroom to hand deliver the letters, so I asked Salvador to call her family. Instantly, they agreed to participate. I was excited because only Rose's family returned the letters regularly. Although I responded, communication never became dialogue as the exchange of ideas stopped at my response.

To understand why Rose's family returned the letters regularly, I asked them what they thought. Her mother replied, "I tried to answer with a little of what I know and nothing more. In fact, I like to plant roses, the flowers mostly. The vegetables I don't have much of an idea of how." Although she did not think she contributed much about vegetables, Hilda shared information on how to irrigate the plants, as well as how to make the soil mixture healthy for them to grow. When I sent home the letter asking for ideas about irrigation, Hilda said, "Well, I think a good way of doing would be use a hose. That's what I use to water my plants." She explained further, "There are some black hoses that are like sponges. You connect them and they let the water escape." In another weekly letter, we explained to families that we were still trying to figure out a solution for water. Hilda responded again, "Another way would be a sprinkler on a timer." I responded directly, explaining that it was difficult to use a system like that because we needed a key to turn on the water. For Hilda, it seemed that because of the established garden at the home and her love for flowers, she felt compelled to share her knowledge and interest with others.

The letters also allowed me to keep up with the families' herb plants. After a few weeks, I asked families about their plants in a weekly letter. Francis was the only one who responded and told me that their "herb plant is about the same size; I keep it watered and placed it in a window for sunlight. Some of the leaves are changing colors, so I think it's time to change the size of the pot." One week letter, I responded to her letter, inquiring about whether they had replanted the herb. Although I did receive a response until the end of the project, Francis did share the information in the letters. "Our plant was thriving for about a month," she explained, "but it started to dry out and died." However, as this plant was dying, Mason brought the seedling home from school. In the letter, Francis explained how "Mason was so excited about how big it might grow." Unfortunately, she then explained that "the plant was not in very good shape when we received it. We watered it and placed it in the sun, but it just didn't thrive." Although their plants died, she wrote that "even though we did not have luck with our first plant, we have planned to care for a new on over the summer." This was just the beginning in their home for plants.

During the third week of our cluster, I sent home a letter explaining the taste test the students conducted. I asked families about why they thought food was grown far away. Hilda explained that "the majority of the earth is good, but in some places…plants can't grow without a special mixture of soil." This demonstrated that the families did have knowledge of what plants need to grow. Hilda further stated that "a lot of vegetables freeze at such low temperatures, and also there are fruits that need hot places." Francis' response was different, as she explained that "our food comes from far away because of supply and demand." Although different, both

Hilda and Francis presented practical reasons why our food most commonly comes from non-local sources. Initially, I discovered that Rose's family had access to local foods through the letters. After our taste test, I asked families what they thought about produce coming from so far away. Hilda explained that, "Yes, we have access to local food from Georgia, Florida, and…South Carolina." I made sure to ask them further about his during our interview and learned that they had access through their produce business.

When asked about whether families would prefer to consume local or products grown far away, they said they preferred local items. Hilda explained, "Well, I think local products are better because we can get them fresher and the products from other countries take a lot of time arriving at our houses." Maggie agreed, stating that "I like local fruit because it is fresher and usually a lot tastier." Although Francis provided a practical reason for where food is grown, she said, "I would prefer locally grown produce and not produce that has been sitting on a plane or truck for many days." It appeared that she had a similar response to the students in class as they watched the plane fly from Chile to their community.

As the project progressed, only three of the six families were responding to the letters, and I wanted to understand why. When I asked the families about the letters, surprisingly they said they all really enjoyed them, and found them informative and helpful in understanding what their children were doing in school. Arturo's mom, Karolina explained that, "it was beautiful; it was a wonderful experience because he was excited." Although she had read every letter, it was difficult to respond because of time constraints. However, she felt it was the best

method because "you can read the paper one more time, you listen to a message only one time," suggesting that she enjoyed having a physical piece of paper that she could hold onto.

Finn's family also had difficulty returning the letters because of time constraints and duties at home. James explained that he "read most of them, but got so distracted." Maggie responded to one letter after being prompted by the paraprofessional in Finn's classroom. However, James and Maggie said they appreciated that I wrote and asked "about what they were doing and to see if [they] know anything about it and give feedback."

James explained that it gave them a sense of involvement and empowerment because they could have input and a potential say in what has happening in the classroom. When I asked what their favorite part about it was, James said, "the fact that you're letting the parents have their own input; the fact that I could have an influence somehow." Maggie enjoyed having "a say on what the kids are doing at school." Because James stays at home to care for their children, he doesn't have "the freedom to involve [himself] at the school."

Most families expressed that time and everyday life events made it difficult to respond to the letters, but Francis mentioned something else. She said that, "it showed what the kids were doing each cluster session, so it just kept me informed." Moreover, although she responded to most of the letters, she was careful not to give us too many ideas because she was more interested in letting the kids get "into it, how interested they were and about their ideas and I was saying that a lot of their ideas were good ideas." Francis did respond to each weekly letter, but she did not

want to give them back to me regularly, although I did receive a few back in the beginning. She kept her remaining responses until our final interview. She explained that she wanted to respond, but in the first letter, she said, “I have several great ideas for your garden, but I would prefer the students develop a garden they want.” She thought it was important not to interfere because she wanted the students to do what they wanted, not what she thought they should do. She felt that her feedback might stifle their potential to realize their ideas. Francis’ perspective on the letters made it difficult for me to use them as dialogic tools because if I did not receive them, I could not respond, decreasing the families’ ability to respond as well.

To understand if the letters provided a way for families and students to communicate about their experience, I asked Francis if she talked to Mason while she answered them. When I asked, she said “no because most of them were asking me about my opinion, but I would have. Maybe include prompts.” As Francis offered another insight, I realized how important family contributions can be for learning in the classroom. “I guess like, if, more feedback between the parent and the student. Just put one question, like you could ask. The way it’s set up now is perfect. But include one question that I ask him about clusters that week, so then it will start a dialogue conversation, at least 1 question a week.”

Although the letters did not facilitate involvement between me and the families, the garden experience described in them did create conversations at home about clusters. When the letter describing our worm bin arrived at Finn’s home, Maggie said that she and Finn talked about worms, and she told him what she knew.

I asked families what they thought of the worm bin, and Maggie responded by saying that "I don't really know about the bin, but I know that worms regenerate." Sharing her enthusiasm with Finn was something important to her, and she asked him about it and continued sharing her knowledge about worms with him, She said that "he thought it was cool that if you cut a worm in half, it would grow back."

In the same letter, I asked families if they knew of anything else that could help our garden grow. Hilda shared, "I've heard that the poop from cows, horses, and chickes also help plants grow, but I haven't tried that, although my neighbor has." In response to the same letter, Francis said, "The only advice I can give the cluster about making the soil better is to be sure the soil you plant is free of weeds and has been turned and prepped." This information was something we did not share directly with the students. However, during planting, Devin explained that weeding was necessary and Manuel showed his friends how to even out the soil.

Students came home and talked about the garden, what they were going to plant, and challenges that they were not quite sure how to solve. Sharon explained that Chloe came home and told her, "It's going to be really hard. And, she's not sure she knows how to, but she's really gonna try." This was in reference to our scarecrow. In a weekly letter, Hilda tried to help us solve our problem. She explained that "we can put a stick in the middle of the head towards the body and then tie it around the neck so that you can't see the straw." Unfortunately, even this advice could not save him.

As they discussed the garden with excitement and gleams in their eye, parents were excited. In response to the final cluster letter that shared how they

prepared for the cluster fair, Francis explained that the "cluster was a great experience for my child. He was exposed to many great gardening skills." Some noticed that they spent more time digging in the dirt, and were very interested about the well-being of their plants.

At home, Finn "talked about it a little bit, and he said he was enjoying it, and he always asked about his plant. I tried to grow something else in it [after it died], and he said "is my plant growing, is my plant growing?" James and Maggie showed him how to care for his plant and make it grow. "The one thing he liked about it that I showed him was some mornings when I woke up and looked at the plant, and it was droopy. So I put water in it, then like 10 20 seconds water, you can watch them stand straight up." Maggie described how much "he liked that. The fact that you could take a plant, and take it outside and watch it grow a lot more inches just by letting it sit outside for a couple hours." They also said that Finn was very involved in watering the plant. As they described the process, James and Maggie described their tag-team effort. "He watered it, but we made sure he didn't water it too much; I used the spray thing on it over the sink. And I said, hold it over, count to 3 and let it go" This was a ritual that he performed with Finn daily, as did Maggie, except she "gave him a cup to do it."

As I analyzed the data, it became clear. I did not have a lot of evidence through the letters to show how families and their knowledge impacted student learning in the classroom, but families told me about the students sharing stories of gardening at home as they talked about worms, watering plants, or even as the students trudged home with potted seedlings in their arms. As I listened again to the

students' conversations in the classroom, with teachers and with other students, they were sharing information based on their experiences at home or in their community. Although not explicitly shared by families with me, the students were living it. They were living the experiences that contributed to their realities of gardening.

Rose also told us that "my mom has flowers in the dirt at home." "Would you like to put flowers in the garden?" Mrs. Carnes asked, to which she excitedly said, "yes!" We always tried to make connections to the students' funds of knowledge and provide opportunities for them to engage in their gardening interests from outside of school. "I'm going to give you a flower bulb to take home to your families. Just put it in the ground and it will come up in the spring."

Towards the end of our time, we had extra seedlings. Because of the excitement the students showed as they planted and talked about their families, we decided to give them each a plant to take home. "Would you like to take them home?" we asked. "Yes," they said, "can we eat them?" "When they grow, you can eat them," I said. Ready to take them home, the students surrounded Ms. Welch and began helping her by filling the pots with soil, as others removed the mesh and carefully handed the seedling to a friend, who then placed it in the pot. In the last letter, Francis explained that she "did receive a plant. I am reminded often that we need to hurry up and start a garden at home. I'm going to let him pick which fruit or vegetables we will plant in our garden."

Families also noted connections that their children were making at home, based on experiences at school. Francis explained that Mason was excited and that

his “whole thing is making things better.” Particularly with his plant at home, she explained that, “even though he saw them before, he’s just making sure that they’re okay now.” She also explained that he made connections to the food they ate at home; “when we eat vegetables, he would say, this can be grown in the garden; growing the garden was good for the earth.”

I asked her if Mason brought up clusters at home, and she said that he didn’t specifically, but that he did make connections. “When we eat vegetables, he would say, this can be grown in the garden. He brought it back around like that, but never like a deep, deep interest, but once he, he associates it with certain things, and then you can tell, oh they’re learning about that. So he knows that certain foods are fruits or vegetables, ad you can grow it in the garden. He made that association a lot.” Excitedly, I asked if he talked about the worms or cluster fair activities. “I learned about the worms in the letter, but he never said anything about them.”

At the conclusion of the project, the way families talked about the classroom activities was much more connected to their lives than in the beginning. In this regard, the experiences the students shared, and the information gathered from the letters made *impacts* on the ways families talked about school and clusters from the beginning to the end of the project. The relationship between families and students was not unidirectional into the classroom, but reciprocal. The question I should have asked was not how did family impact learning, but how did the students impact their communities?

Student Impact on their communities

Family impact *"I thought about setting up a garden"* Throughout the vegetable garden cluster, information was exchanged to enhance the opportunities for learning. Although I strove to involve families through the letters to see how their contributions would impact student learning, the opposite was true. As the students discussed their cluster experiences at home, families were impacted. Initially, some families had gardens, which led to leadership in the classroom. Others who were very interested transferred that excitement to home, leading to the planning of gardens. At the time of the project, only two families had existing gardens with fruit, vegetable, and herb plants.

In some cases, I discovered that it was not the family that initiated experiences in the garden. At home, Arturo was heavily involved in the community garden in their neighborhood. When I asked his mom about her experience, she replied, "Well, me with plants, well I never planted plants, well just in the house." Salvador asked if his dad had experience, and she replied shyly, "maybe, I don't know." As I listened carefully to the exchange primarily between (Norma) and Salvador, she continued by describing not her own, but Arturo's experiences. She told us that, "during the vacations, he would spend all the day working with those who would come here" to the garden. "I've gone there because Arturo planted chiles, tomatoes, melons." Although she was not directly involved in the community garden, she did visit it to see his progress and proudly talked about his interests in gardening. As Arturo's interest grew, he worked more with his dad in the garden. "Yes, we will plant, but not yet," Norma explained. "We want to, but not yet.

Tomatoes, chiles, corn, squash." Until then, she explained, "Arturo is working in the library garden; they're planting lettuce over there." Arturo showed his excitement about the cluster by talking about it with his family and telling them "that it was a lot of fun." But, most of his knowledge from school and home was put to use in his own yard or community garden planting.

At Rose's home, the other family with an established garden, Cruz discussed that they "liked to plant a lot of things, but now we have not much time." In addition, before the cluster began, Rose showed no interest in working in the garden. As we discussed their letter responses about irrigation, she listened carefully and then shared her ideas. "Or we can grab a bucket and put it in the water, and then we could throw some at the plants." Her family went on to explain that Rose and her sister told them about compost. Her mother explained, "she says ok you put the food over there you can have like compost for the plants."

Because of her interest at school, I asked Rose if she would help her mom in the garden, and she nodded yes. Maria then said, "thank you for helping my daughter to learn something different. It's been an experience for her. Thank you so much." Her gratitude was uplifting, particularly as they began showing me their beautiful garden outside. Although her father explained that "it used to be more beautiful when we had more time," they still had a healthy peach tree, along with mint, roses, and lots of wild flowers that the family had been spending a bit more time with than before Rose participated in the cluster.

Just like Rose, Maria was excited to learn about gardening at school, but had little experience at home. When I visited her home, her mother explained that "she

did talk to me about plants, and she told me, all the family members can come plant." Her mother explained, "I don't plant vegetables and stuff like that; I like that she is learning to plant." However, because of the plant that Maria brought home from school, her mother became involved. "She brought only some little stems, but we planted them, and nothing came of it."

Undiscouraged, Maria and her sister had begun planting together. During the interview, her sister explained that they ""went to aunties house and she was planting plants and she said why are planting the plants in the ground, and we said this is the soil you plant plants in the ground." The flowers that they planted together provided an opportunity for them to use their experiences in school in their community to help others and each other learn more about gardening. As we concluded our visit, Maria's mom, Iris, mentioned that her "uncle brought them strawberries," and they planted them in planters that they attached to their home. Her mother encouraged Maria and her sister to show us their strawberry plants outside. Maria led the way, proudly showing us her sister's plant first and the red strawberry growing on it. Even though Maria's own plant was smaller and not as healthy, she was so proud that it had grown. I took a picture of Maria standing in front of her strawberry plant, and she smiled from ear to ear. Her mom smiled and wished us well, telling Maria as we left that they could add soil to her plant to help it grow. In the end, her mother did become involved in their garden.

Just as interest in gardening at home grew in Maria's family, the same was true in Finn's family. When I met with them at the conclusion of the project, I asked about their perceptions of Finn's experience. Throughout the cluster, they said they

noticed that "he's been digging in the yard a lot more now." Although the family would enjoy being outside in the yard, potentially planting a garden, "round here, man, you have to get a permit for just about anything. If I want to get an awning, I have to get a permit just to put it on the trailer. And if I want to pull up a stump, I have to get it approved." The protocol for permits that appeared to be frustrating in our initial meeting, was suddenly not a barrier. As James and Maggie saw Finn spending more time in the dirt, the idea for a garden sprouted. "I thought about setting up a little garden out there," Maggie said. "If we were to do something like that, I think he would enjoy it. The space they have in mind is " a little tiny square and it's got railroad tracks around it. And we just need to plow up the ground right there." James added, "If you just till it up and put nutrients in it, it will be fine."

Before the cluster began, Mason was known as the green police at home. He makes sure that items are recycled, lights are off, and the water is not left running. In general, Francis described him as someone who loves learning about new things, and "if it's interesting to him, he's going to ask more questions about it. So part of being introduced to gardening, he's probably going to want to plant one." Initially, we discussed the prospect of Mason wanting a garden. As it turns out, Francis wrote in one of the letters later that month about how they had decided to start a garden this summer, and she told me of their plans when we met for the second time. She told me that Mason "said that growing the garden was good for the earth. So that was his thing. We have to be nice to the earth, and he didn't really say he wanted to grow anything, but he wanted to make sure I knew that that was another way to be nice to the earth, by using a garden."

Just in the few short months since we had last spoke, Francis's interest in the garden seemed to have grown. She said, "That looking out the window, you don't need a large space for a garden. You can have a small space for a garden, so that's like given me inspiration." I asked about their garden again, and she said that "once we get out of school, I'm gonna let him choose 1 or 2 things that he wants to grow, and we're going to try it. Broccoli is probably going to be one because that's one of the ones he eats, so we'll probably end up doing more fruits."

However, for Francis "it just reiterated...how important gardening is. Just even if you grow 1 or 2 of your favorite fruits or vegetables, you know, it's a good thing to do." She reflected, "At the beginning, I said I liked gardening, it's just something I have to fit in my schedule, you know? Just to see something grow from just a green plant, you know? I kinda like that." In the letters, Francis also explained that she liked "the idea of talking with the cafeteria staff." As we concluded our final meeting, the experience of clusters for her son brought back memories as we spoke. She began telling me about visiting her grandmother's house and sitting under a peach tree; "I just thought of that. We had wild blackberries in the backyard when we were little." As a smile crept on her face, I was positive that Mason would tell someone later in his life about the garden he started with his mom and all the moments they shared growing a garden.

The impact that occurred from students to their families was important because the students were able to continue gardening at home. The learning that occurred as a community in the classroom was transferred to their communities outside of school. In the last letter, Francis shared that "I think gardening is a good

skill for all communities to implement to help the earth and community." In some cases, the students became more involved in community gardens located near their homes, while others rallied their families to install a garden in their yard. Regardless of the location, all families expressed their own interest in cultivating plants, a desire that was not present before their children shared their interest and excitement for growing gardens.

As the students shared their excitement at home, they also shared it in the classroom. As the teachers listened to the conversations students had during the planning, implementation, and evaluation stages of the project, they were also inspired. The students impacted their ideas of gardening as well.

Teacher impact. To understand how that impact occurred, I asked Ms. Welch to explain why gardening was important. "I thought it was a very cool experience. I learned a lot, I mean I had no idea about gardening. It was very cool and the students were very into it." Then, she referenced the taste test experience. "Some of them in my group were like wow, this really tastes different." Through that experience, she decided that she "just can't buy from a store because they taste so different." Because she mentioned that she enjoyed eating her neighbor's home grown tomatoes as I child, I asked if she thought about having a garden. "Well, because I live in an apartment still, I haven't been able to start a garden." As we talked about the needed materials for a container garden, she continued, "They make a beautiful garden, so my level of interest has grown, and my knowledge about the subject has grown. You can just have your own stuff and I don't know, it's

something fun to do outside with your friends or family too, so that's why I would say it's important."

Funds of knowledge conclusions

Gardens were important in the classroom because the students shared ideas and experiences with each other. Throughout their 9 weeks together, they had complex conversations that facilitated dialogue. The funds of knowledge they possessed about gardens was astounding at times, and our guidance was rarely required. It was imperative that they understood it was their garden, so everything that we planned, implemented, and evaluated was due to discussions they had with each other, and us when necessary. Nora did have to balance our help and their ideas, particularly when they wanted to do something we knew would not work. She explained, "We honor what they're thinking and wanting, but we provide them with reasonable expectations and information they wouldn't have had otherwise. And there's no way around that because they couldn't grow blueberries right now, even if they wanted to. We could give them a whole bunch of blueberry bushes and they would die. I think that's been a really powerful way of teaching them."

As a teacher, Mrs. Carnes intentionally created a sense of democracy and respect in her classroom. During clusters, the students engaged in many discussions that caused them to take a position and defend it. In doing so, everyone in the room had to not only listen, but acknowledge the idea so that it could be deliberated and decided upon collectively. Once a consensus was reached, there were often remaining questions that we could not answer. The students soon realized the importance of asking others to join us. In the classroom, the students actively led us

in imaginative, insightful, and meaningful directions that all reflected their own experiences, interests, and aspirations.

In most cases, the successes stemmed from the collaborative community effort taken on by many different stakeholders, ranging from volunteers, families, teachers, and professional members in the community (The National Farm, 2004). As collaborative communities came together to grow the garden, partnerships were cultivated so that in the face of challenges, the group effort could yield the desired outcome by utilizing the many different funds of knowledge that were contributed. From a social constructionist perspective, I see those successes as evidence for acknowledging that our everyday lives take place not in isolation, but in interaction with each other, particularly in the garden.

Conclusion

As the culminating cluster fair concluded, we had time to reflect on the experience with the students on their journey to grow a garden. As Mrs. Carnes thought back to the beginning, she said, "Well they came in with a thousand ideas all at once, so it was just like one idea after another, after another." She continued, noting the importance of funds of knowledge and their interest in the topic. "As far as knowledge base the kids left with and what they were able to show us in the charts to summarize what they had learned, it was just very rich. It was really kind of awesome to see them actually produce some things and get things done." Because the goal of enrichment clusters are for students to be engaged, it was important that we were "facilitators and taking the lead from the students," Mrs. Carnes explained. Based on their interests and experiences, we facilitated an

environment that allowed them to take risks and engage in learning for themselves, "not the exact standards of what you should learn at a certain grade level." This was an important part of the cluster that Nora was passionate about.

As the students explored their interests, they formed a community that took action in the garden. By experiencing first-hand the planning, work, and evaluation required for a successful garden, they learned about seasonality, regionality, plant resources, as well as the importance of learning from one another and the communities surrounding them. Although we guided them, their desire to learn from families and community members enabled them to make connections between what they wanted to do, and what others were already doing that could help them.

The more they learned, the more excitement they had about sharing what they knew with others. In the end, their efforts to grow a garden were successful, and they wanted members in their communities to know how to do the same. As they worked together to organize the cluster fair, they evaluated their work. Although they did not accomplish everything, they had high hopes for the future and the work that would continue to grow *their* garden.

CHAPTER 5

DISCUSSION

The community that we formed in the garden began when we formed a circle on the carpet and shared why we wanted to be in the vegetable garden cluster. This was the first attempt to understand who everyone was and where they came from, particularly the students. Understanding the sociocultural nature of their lives was important before moving on because we needed to know how they were influenced in and out of the classroom (Rogoff, 2003). As we got to know each other, the possibilities seemed endless as they shared their funds of knowledge (González, Moll, & Amanti, 2005). Their ideas led to plans that required us to work together to take action. Everyone's funds of knowledge were considered to thoughtfully evaluate our work. They drew upon each other's funds of knowledge and cultural tools to learn more about what they could do and how they could accomplish it (Vygotsky, 1978). We encouraged the students to take charge and proceed down a path that all agreed upon, which occurred as they revised the tools and knowledge they brought with each other (Rogoff, 2003; Vygotsky, 1978).

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As a participatory action researcher, it was important to remain true to the participative aspect of the project and let the students lead the way. As I told them, "you're the researchers." This was their inquiry into gardening, not mine. They negotiated interactions to make meaning of the experience (Raskin, 2002). From a sociocultural perspective, it was through interactions that they developed as a community of learners; eager to grow a garden and share their efforts with others (Young & Collins, 2003). They created a community with its own social and cultural components as they experienced new and intriguing, sometimes challenging situations (Vygotsky, 1978). As they identified the problem, thought of solutions, and took action, they each had a specific role and became action researchers themselves (Berger & Luckmann, 1966; González, Moll, & Amanti, 2005).

As the students engaged in experiential, hands-on learning in the garden, they did so as a community (Stringer, 2007). Participatory action research reflects the collaborative nature of the learning experiences because they created a personal

discourse about gardening and its implications for their communities, both in the school and at home (Patton, 2002). Through their conversations, I was able to understand how they made sense of the experience, in real-time (Patton, 2002). Using my knowledge and understanding of their experience as a community, it was and still is my responsibility to take action as a researcher concerning aspects of the project the students could not access (McIntyre, 2007; Stringer, 2007).

The following discussion represents the process of what learning in the garden most often accomplishes, as well as what it *can* accomplish. When communities come together and share their funds of knowledge, they can operate together for change and social transformation can occur (Gergen, 1985; Kindon, Pain, & Kesby, 2007). However, the knowledge generated between groups is specific to their lived realities of the garden experience, so the following discussion is specific to this local community (Gergen, 2001). Even though the experience was confined to a group of 13 students and their teachers, family, and community, their experiences provide a gateway for future actions in the garden, not only theirs, but in other communities who want to grow a garden. I will discuss the learning implications, challenges, action components, and future school garden possibilities. To conclude, I will present study limitations, future research possibilities, and my reflections for the future.

Learning Implications

School gardens provide a rich landscape for learning (Blair, 2009; Edwards & Cutter-Mackenzie, 2006). Not only do they encourage teachers and students to go outside to learn, but they can also be an asset to learning in and out of the classroom

(Lo, Affolter, & Reeves, 2002; Whitehurst & Lonigan, 1998). One of the assets gardens provide is the ability for students, teachers, families, and community to reconnect with the earth as they dig in with their hands and experience the lifecycle of a plant from seed to edible food (Nimmo & Hallett, 2008). It can be difficult to utilize, and therefore integrate school gardens into school systems because of standards-based education (No Child, 2001). But, if adventurous teachers take their students on a journey into the garden, then they have the opportunity to engage in meaningful learning opportunities that address standardized curriculum and a sense of ownership through interest-based, experiential learning (Robinson-Obrien, Story, & Heim, 2009; Lo, Affolter, & Reeves, 2002; Nimmo & Hallett, 2008).

Standardized Curriculum. A prescribed curriculum can be a huge barrier, particularly when teachers do not know if they are working against or with the standards that they are required to follow (Gruenewald, 2003). In some schools, school gardens are perceived as something that takes time away from learning (Ross & Frey, 2002; Wake, 2007). In the literature, it is known that teachers feel up against the wall, stuck in this cycle of monotony where they have to teach to the standards, and often times feel like they have to teach it in a very specific way (Gruenewald, 2003).

Standardized education is an important part of the culture of schools today. It is important to understand that students can make connections between the garden and content areas required in school (Children, 2009; Leakies & Sheavly, 2007; No Child, 2001).In this project, Nora felt that “this garden cluster works so well is because I really don’t have to worry too much about that because it all fits in so

clearly to kindergarten, 1st and 2nd grade standards." As we progressed through the 9 weeks together, it seemed effortless for her to incorporate the standards.

> In kindergarten science, they learn about the needs of living things, in 1st grade science, they learn about that again and about parts of plants and all of that kind of stuff, 2nd grade is an extension of that, so it's kind of built in and I think it's just a built in thing with ours, which our make our life easier.

School garden lessons do not always happen so easily for some. Because of standards, teachers can feel confined (Gruenewald, 2003). In our garden classroom, the topics the students inquired about naturally addressed standards. To learn more, we had to read our classroom fuzzy, and math was necessary when we counted our taste test votes. "If you're being creative," Nora explained, "you can tie almost any topic to a standard." The challenge in utilizing gardens in schools is also about creating a school environment that is supportive and willing to let teachers and students engage in learning beyond the walls of the *normal* classroom (Nimmo & Hallett, 2008). If supportive, many standards can be met as students learn to grow a garden (Robinson-Obrien, Story, & Heim, 2009).

Support is important, not only for the teachers but for students as well. The garden can be a safe place for students to explore and experiment, but only when they feel encouraged and supported by teachers and administrators (Nimmo & Hallett, 2008). The school-wide enrichment model provides a built-in support system for teachers by administrators, and Nora has noticed that the students are "bringing problem solving into our classrooms" during the rest of the school day (Renzulli, 1978). Because the students felt supported in the garden cluster, for them

to explore. If teachers and students feel supported, then they can take risks, learn more about their world, and make connections with it.

Real-world Connections. One implication for learning in the classroom is eco-literacy, the knowledge of the world around you (Ozer, 2007). As the students worked in the garden learning about regionality, seasonality, and plant resources, they were engaging in eco-literacy (Blair, 2009). In most cases, the opportunities to learn about the earth were directly aligned with the standards (Edwards & Cutter-Mackenzie, 2006; Lo, Affolter, & Reeves, 2002; Whitehurst & Lonigan, 1998). After her visit to the school yard, Margie communicated the potential she saw in the garden for many different learning opportunities. "It has a lot of potential to reach a lot of kids, and as long as we can get the rain barrels and the gutter working, I feel like it has a lot going on because you can teach about the rain water collection, water shortages, water use, what happens if you overuse water, it being a limiting resource and you have the whole system right there and it's very close together."

The ability to make real-world connections is a key component of school garden successes. Students make clearer connections between what they are learning in the classroom and the world around them when garden experiences are integrated into the standardized curriculum (Graham & Zindenberg-Cherr, 2005; Lieberman & Hoody, 1998). At the end of our cluster, the students began to make the connections between what they were growing and the food they ate by asking for it to be served in the cafeteria. This creates a link to health and wellness, an important topic to discuss as the current rates of obesity in young children continues to grow (Casey, Szeto, Lensing, Bogle, & Weber, 2001; Ebbeling, Pawlak, &

Ludwig, 2002; Heneman, Junge, Schneider, & Zidenberg-Cherr, 2008). Because health extends beyond the school, it is important to look to the community and understand their role.

A topic that has many possibilities is the community (Wake, 2007). If students are introduced to how gardens relate to their community, they gain a sense of place (Green, 2007). When they see "that their ideas were real things that people did in the real world," Ms. Welch explained, they can make connections to opportunities in the community (Wake, 2007). If students understand that "there are farmers here…,they realize, oh, there are people who make food and you don't just have to the store and get it, you can grow it and eat it yourself." Students can take that information and see things in their communities happening, like gardens (Chatterjee, 2005; Green, 2007). As this occurs, they become invested in the school garden because they're learning responsibility for their community and learning to be responsible citizens of the earth, taking ownership (Peloso, 2007; Wake, 2007).

Sense of Ownership. In participatory action research, a sense of ownership is created because a group of people works collaboratively towards a common goal (Stringer, 2007). Students directed their participation in the garden and had decision making power. This gave them responsibilities in the classroom and they knew that nothing would be accomplished unless they worked together, creating a sense of ownership (Blair, 2009). Nora explained how she saw them taking ownership over their ideas, "they're much more open now. I'm sure they always had them, but they just didn't…know how to express them in the classroom; now it comes out all over the place." When students learn "in an applicable, hands-on way,"

Debbie explained, “a carrot comes out of the ground…and that provides self-sufficiency.”

If students feel supported in sharing their ideas, then they can develop a sense of pride (Nimmo & Hallett, 2008). Students taking charge in the classroom is an important aspect of enrichment clusters (Renzulli, 1978). They have control over what they learn, and sometimes how they learn it, making it a more relevant experience in their lives (Renzulli & Reis, 1994). Ownership is also cultivated because they plan, implement, and evaluate their actions (Clarke, 2002; Wake, 2007). When they took action, Angie noticed that “they seemed to take more ownership,” which enabled them to see possibilities for the future. When “they have the skills and knowledge to take it with them and use it in their home,” Ms. Welch explained, students can share with their families and demonstrate a sense of ownership in their community spaces where they could take charge and grow a garden. Thus their experiential learning is truly interest based.

Interest-based, experiential learning. There is high value in experiential learning (Dewey, 1938; 1998). If teachers listen and pay attention to the cues students give, then the experiences the students have are more meaningful and relevant (Coyle, 2010; Hyun, 2005). Once students can tangibly experience the world, learning is different (Blair, 2009). Debbie explained that through hands-on learning opportunities, “kids get outdoors during the school day…so gardening is just part of an outdoor classroom.” Through personal experiences, “we all knowing from working on it that this stuff does totally teach math, science, art, social studies,

everything. But just getting the world to not think of it as something extra, but as a fun way to learn" is important (Dewey, 1938; 1998).

The process of learning is crucial, especially if students are allowed to make their own path (Laevers, 2000; Loughland, Reid, & Petocz, 2002). Students can make meaning through discoveries they want to make, interaction with others, and dialogue with peers and community members (Wake, 2007). In doing so, they are action researchers who are sharing their findings with one another (Cutter-Mackenzie, 2009). If students have a purpose, then they come into the classroom "ready to listen and talk more," Ms. Welch explained. The tangible experiences in the classroom also contribute to student excitement. In enrichment clusters, "they get to go in the garden and actually experience instead of just talking about it." As students have the opportunity "to see what's out there and actually plant it and watch it grow and have a part in it which definitely plays a role showing the importance of gardening in their own lives," Ms. Welch explained. By working to grow gardens, students also experience the challenges that occur.

Challenges of the School Context

When implementing a school garden, a variety of possible challenges present themselves. In particular, the school calendar year can be challenging when planning a harvest. If family involvement and community partnerships are sought, additional challenges related to implementation and maintenance of the school garden can emerge (Ozer, 2007; Ross & Frey, 2002).

Calendar Challenges. When the students planned what vegetables to plant in the garden, Manuel raised his hand, "But how if we are going to have the plants

grow because it's gonna be May and we get out of school in May." Mrs. Carnes responded, "He's right. Some of the work you do right now is going to end up producing fruit when you're out of school. You can talk to your families about coming to the school over the summer and helping to pick the vegetables and you can eat them. Some of the stuff that doesn't get ripe while you're in clusters, but you can get it later." In most school gardens, the spring harvest is not ready until summer, once the students have left (The National Farm, 2004).

This concept was not mentioned by the students again, but it is an important consideration, particularly in regards to common challenges in school gardens. Gardens don't work on semester time tables (Ozer, 2007). The prime time for planting is in the spring and summer. If plants are sowed in the spring, however, the students will not see their efforts produce anything, making it difficult to create ownership. This was an issue identified by Francis because she just wanted "it to be something they can actually see happen. Let them be able to see what their hard work can produce."

Thus, it is difficult to work on a school's schedule when you're dealing with plants that don't produce at the right time. It is also difficult because the school has certain expectations, which Nora further explained. "We had the expectation to have some sort of finished product," but this expectation feels impossible when also trying to follow the students' leads. Flexibility and creativity are important, as well as the support from other volunteers in the community, administration, and families. If they are involved, then the students can continue working in the garden during the summer.

Because the school garden calendar makes it difficult to plan and maintain school gardens, support is necessary (Blair, 2009). When teachers work in the garden alone, the task can be daunting (Oxenham & King, 2010). However, if students feel ownership and share that with families, there are opportunities for the garden efforts to continue after students leave for the summer (Joshi, Azuma, & Feenstra, 2008).

Family Involvement Challenges. Family involvement in school gardens can occur in various ways, whether they participate in classroom activities or at home through conversations (Ozer, 2007). When families do participate, students can be excited to share their experiences, both in and out of the classroom (Epstein, 1995). However, even when school environments are welcoming of families, it can be difficult for partnerships to develop (Davis & Yang, 2005). In school gardens, family partnerships have been successful using newsletters and homework (Hoffman, Franko, Thompson, Power, & Stallings, 2009). Successful involvement also occurs when gardens are relevant to families' lives and they are involved in the planning, implementation, and maintenance phases (Robinson-O'Brien, Story, & Heim, 2009).

If family funds of knowledge are accessed, then they can contribute to the garden efforts (González, Moll, & Amanti, 2005). Although newsletters can be effective, they may still promote one-way communication depending on the buy-in or interest families have in the garden experience (Cutter-Mackenzie, 2009). To encourage dialogue and promote learning at home, students can write to their families about their experiences in the garden (Davis & Yang, 2005).

Students may generate interest for the families, but it is still important to recognize that school gardens may not be interesting or important to families (Robinson-O'Brien, Story, & Heim, 2009). I listened as Nora said, ""it's not them who chose the cluster, it was their kids, so they may have no interest in gardening." Some families may have funds of knowledge or experiences related to gardening; it may not be relevant in their lives presently (Robinson-O'Brien, Story, & Heim, 2009). Additionally, families may not have time. For teachers and involved community members, the garden is related to their job, as it is for researchers exploring the landscape. It is necessary to understand that, as Nora explained, "they have jobs and they have kids, and we're asking them to take on something else." Because families have lives outside of the schoolyard, community partners can be assets for teachers who need support (Nimmo & Hallett, 2008; Malone & Tranter, 2003).

Community Involvement. In enrichment clusters, the focus is on what the kids want to do, as well as the actions they take to accomplish their goals (Renzulli, 1978). This method supports the children and helps them feel ownership over the garden, but it is difficult in terms of community or family support and involvement, particularly community (Blair, 2009; Nimmo & Hallett, 2008). This is especially a problem if teachers are hesitant to do anything without the support of the students. Nora explained that we had to "be explicit in what the purpose of the cluster was" because it can be difficult for community members to understand the purpose of letting students drive the process (Renzulli, 1978).

In some cases, the lack of communication spurs more open, clear, and communicative dialogue between every member of the group, teachers, students,

and partners (Nimmo & Hallett, 2008). It makes teachers more conscious of how they approach community partnerships. It is important to make the learning expectations clear to the community members. It is important to involve the community to engage them in conversations, which can not only foster partnerships, but also help create a balance between their capabilities and student ideas (Nimmo & Hallett, 2008; Wake, 2007). Involving community can also make them aware of issues happening right outside the door, potential of labor shortages on farms and social justice to enter the conversation (Blair, 2009; Smith, 2002)

If community members are brought in to collaborate with students and teachers, success is possible because resources are shared (Heneman, Junge, Schneider, & Zidenberg-Cherr, 2008; Nimmo & Hallett, 2008; Ozer, 2007). The success in school-community partnerships can be mutually beneficial (González, Moll, & Amanti, 2005). If everyone is sharing resources and supporting one another, then they are more likely to take ownership of the garden and hold each other accountable for the action that occurs (Blair, 2009).

When community members are involved with school gardens, it is often because they are passionate about environmental and outdoor education (Joshi, Azuma, & Feenstra, 2008; Kingery-Page, Hunt, & Teener, 2010). This passion and commitment allows them to take a unique perspective in the school garden. When community members enter the school environment, they see that teachers feel that they "can barely get through the day and can't handle getting out into the garden" (Gruenewald, 2003). Sometimes, Debbie explained that "teachers don't like to garden, they have no interest in getting their hands in the dirt" (Joshi, Azuma, &

Feenstra, 2008). Community members can provide intellectual and material resources for the school, while the school can provide another outlet for community members to share their personal or professional passions (Nimmo & Hallett, 2008). But there are challenges in making this happen.

School buy-in and commitments to integrate outdoor classroom and gardening ideas into the curriculum is imperative. Teachers need to feel supported to go outside and allow the students to directly interact with the earth (Blair, 2009). If teachers do not feel supported, then community members face hurdles when trying to implement garden experiences (Kingery-Page, Hunt, & Teener, 2010). In a lot of schools, there are limited numbers of teachers working in the garden, potentially creating a sense of isolation (Oxenham & King, 2010; Ozer, 2007).

For both teachers and community members, "working with regulations and rules and testing" is difficult (Gruenewald, 2003). If school members are partners in gardens, it possible to demonstrate how gardens fit into the existing system (Berkowitz, Ford, & Brewer, 2005). To help teachers feel supported, the gardens can be integrated into the curriculum (Ozer, 2007). If they become part of the school culture, then more teachers might be inclined to utilize them (Kingery-Page, Hunt, & Teener, 2010).

However, some teachers may not feel supported to go outside, or may not know what to do once they get there (Blair, 2009; Gruenewald, 2003). Although rich resources exist through community members and groups, it is still difficult for outsiders to know where to look. In some instances, teachers do not want to use the gardens because they do not have gardening knowledge (Berkowitz, Ford, &

Brewer, 2005; Trexler, Johnson, & Heinze, 2000). In most cases, teachers are more likely to use gardens if they training or help (Berkowitz, Ford, & Brewer, 2005). If they do not know where to get that knowledge, then the likelihood they will use the garden is lessened (Klemmer, Waliczek, & Zajicek, 2005).

Insider Information. As I sat in numerous school garden committee meetings, the conversation always came back to challenges. While we discussed them, the available resources in our community were mentioned. I thought about this and wondered how many stakeholders actually know about them. Debbie thought that "the buzz about green has been beneficial to us and that's helped the way we communicate with the schools, the school district, the administrators, the board, because they're all kind of ready in their lives, they're in green mode."

As I talked to Megs, a local farmer, she disagreed. On her journey to school garden involvement, she contacted three different people before finding me. Knowing whom to contact in the community is limited unless you know exactly who can help. One of the goals of the school garden committee is to advertise our presence within the community, and especially within the schools (Kingery-Page, Hunt, & Teener, 2010). Megs and I talked about how she could help and who could help her, and as I rattled off the available resources she said, "It's all insider information."

Although participating green schools are directly connected to the local chapter of Keep American Beautiful, some teachers do not know what being a green school means. In our situation, we had limited funding. Because of my role within the community, those resources were relatively easy to come by and enabled me to

know about the opportunities for funding within the community. Without those funds, Ms. Welch explained, "I don't know what we would have done if we wouldn't have gotten it." These are a common scenario for teachers, but not every teacher belongs to these groups, nor has the time to seek out funds. In addition, there are many groups who support school gardens, but do not know who to contact at the school level, as well as many different teachers who do not know what others are also doing in gardens. As a result of this project, I directly addressed these issues in collaboration with other garden stakeholders, and we took action.

Communities in Action for the Future

Success in the schoolyard is not uniform (Blair, 2009). Because of the location, resources, and participating stakeholders, gardens have unique purposes and outcomes (Robinson-O'Brien, Story, & Heim, 2009). Collaborations with family and community are assets in the garden, and although particular to the community, consistent methods are necessary (Miller, 2007; Nimmo & Hallett, 2008). In addition, if communities are collaborators, they are better equipped to help provide support through their actions, and continue to explore the possibilities of growing a garden.

Better Family & Community Collaborations. If families are going to be involved in school gardens, they must be partners (Davis & Yang, 2005; Subramanium, 2002). An important step is not only knowing what funds of knowledge they have to share, but what they want to share (González, Moll, & Amanti, 2005). As we discovered, the funds of knowledge we wanted them to share were often not what they were interested in sharing. As I sent home the letters

weekly, the families did not really respond. If the students are directly involved in writing to their families, it could provide an outlet for students to share what they are excited about. This excitement could spur family responses. In Nora's homeroom classroom, they use dialogic journals for students to communicate with their families. However, this occurred in a classroom where "you have a little bit of peer pressure because we're sharing the journals," Nora explained. Unfortunately, the time constraints of enrichment clusters make it difficult to take time to share.

There are opportunities for students to share in their home communities. This can occur as community members make efforts to make connections between students' experiences at school and home (Blair, 2009). The local housing non-profit maintains a community garden in a housing complex where most of the students live. Amy explained that the children in the community "can come home and be involved in the garden." Because the students like to experiment, "there's going to be a children's garden." Amy will set up the garden "so the families will have their plots and there will be a separate area for the children to grow." They envision a lot of potential for families to grow together for food production, while ensuring the children still have a space of their own to choose their own path. If community spaces are limited, then there is potential for community gardens on school property.

School-Community Gardens. Offering stakeholders school gardens as community spaces can help create support (Cutter-Mackenzie, 2009). If community members have a stake in the garden because they have a plot, or a student they are paired with, it is easier to sustain the efforts of the garden (Cutter-Mackenzie, 2009;

Nimmo & Hallett, 2008). Some communities have limited access to land (Malone & Tranter, 2003). As public spaces, school grounds could provide needed land. In addition, because schools are located in communities, they feel that they should provide resources to teachers working in gardens as well.

As a community participant, Amy described her vision of school gardens within the community, "school campus are considered public spaces in the county, so it makes a lot of sense for a number of reasons to use school campuses for community gardens that the surrounding community can be involved in that garden." Using this model, she envisions a "school community garden hybrid. A lot of communities struggle with finding a piece of land that's available in the neighborhood that gets adequate sun light, a source of water, permission to use the land, and schools really offer that." She explained that beneficial partnerships can develop because responsibility for the "garden doesn't fall just on the teachers and the staff at the school., There could potentially be this wonderful, well functioning garden that as part of the trade off that the community members make for using the school land." There are many possibilities for how school gardens function (Blair, 2009). Farm to school programs can build relationships with the community and enable students and teachers to make connections to the real-world (Joshi, Azuma, & Feenstra, 2008).

Farm to School. The students initiated the idea for farm to school during our last vegetable garden cluster. As the students remembered why the garden was important, Chloe said, "the reason we were doing the garden is to help the lunch ladies not have to cook, cook, cook." Manuel continued, "Not to just grab a snack,"

referring to junk foods sometimes discussed in our circle during introductions. “So what you’re saying, and tell me if I’m right,” Mrs. Carnes said, “are you saying that we want these vegetables to be in our lunches…; we want to share healthy food with people?” All the students nodded. Mason said, “Yes, so we can share it with the school.”

As I heard them talking feverishly about future possibilities, my mind reeled with excitement. Earlier that morning, I attended a community garden meeting with various stakeholders. Little did the students know that I had just spoken to the local district’s nutrition director concerning farm to school opportunities. While I listened to the students talking excitedly about working with cafeteria staff to not only eat the food, but also share it with the entire school, I smiled. At that moment, it was clear that it was my responsibility to take action for them. I immediately scheduled a meeting with Ms. Fisher, the county nutrition director.

We talked about how her efforts to improve the menus had laid the groundwork for the potential of farm to school. In addition, in the past couple of years, two schools in the district have been awarded the Fresh Fruit and Vegetable Grant from the USDA (USDA, 2003). The grant awards additional monies to provide fresh fruit and vegetable snacks to schools that have at least a 50% free and reduced lunch. She explained further, “$30,000 has to be spent for the year, and it has to be spent on produce, and then 10% of that can be spent on labor because it extra labor to serve it.” Similar to teachers, training is an essential part of a successful farm to school program, which can make it more challenging (Oxenham & King, 2010). However, because of the extra money the school receives to administer the fresh

fruit and vegetable program, it is an opportunity to begin to spend more money on locally produced items.

The current produce vendor that supplies food to the district is willing to help farm to school become a reality. Mrs. Fisher explained, "We'll just let him know what our plans are and he'll work really hard to find items that are locally grown." Although sourcing things locally is a new endeavor for the produce vendor, she explained that "he's done a great job with apples, and that's our joke…ready to talk apples." As they have talked apples, the landscape has unraveled. "Cost is an issue, availability is an issue, but my goal is to incorporate one item per month." With a plan in her head, Mrs. Fisher talked more about the challenges she faced. "A lot of people hit the brakes with school gardens and sustainability." In the past 2 years, she has attended numerous farm to school meetings, but she explained, "I feel like I'm running in circles. I wish there was a prototype to assist us. It is one of the USDA goals to help farmers."

As such, it is imperative that connections be made between farmers, both large and small, to provide the necessary amounts of product needed to provide food for enough students in the district (Joshi, Azuma, & Feenstra, 2008). In addition to the support of the district to begin and sustain a farm to school program, Ms. Fisher identified two additional components, without which the program would fail. "If students aren't going to eat them, then we haven't succeeded, but they do need to be exposed to them." Mrs. Fisher is passionate about educating children about what they consume. In a recently renovated school she was appalled when she walked in because "the cafeteria was blank; the cafeteria is a learning lab, so we

had a big map of the state created and the places where produce is grown displayed."

She continued to share her passion for including families in the lunch program offered throughout the district. Each month, along with the menus, the nutrition office includes newsletters that educate families about a component of the meals and provides suggestions for things they can do at home. During our meeting, I asked what I could do to help. As the director of local farm to school efforts, I had attended farm to school meetings between farmers, distributors, and district nutrition directors from around the state. I felt I had expertise to offer and desperately wanted to do what I could do to ensure the students' aspirations of eating garden produce came true. I offered to develop a school calendar that included the availability of Georgia produced items and a series of newsletters that would showcase the Georgia item for each month of the school year.

As we talked about the possible roles that school gardens can play in farm to school, she pulled out a FAQ sheet from the USDA (USDA, 2010c). We scanned the page and she raised her eyebrows. "We can purchase seeds for a garden if we sell the food or serve it in the classroom as part of educational lesson." This provides a gateway for funding, taking pressure away from teachers or volunteers. In addition, "we can purchase watering cans and rakes as long as the items are used for the maintenance of the garden." The possibilities seemed endless, and we felt invigorated. However, we also recognized the collaboration that needed to occur for farm to school to become a reality, especially because the students wanted it.

During the vegetable garden cluster, Megs and Lucy, local farmers, contacted me. I was excited because partnerships with farmers are integral to successful farm to school programs (Joshi, Azuma, & Feenstra, 2008). A few years ago, Megs and Lucy began "pulling the weeds and figuring stuff out" in the field. As they both fell in love with food, they recognized issues of food security. Megs explained,

> I think maybe more importantly is the idea of access to the kind of food that we make for people who might not have access to it, people who don't make a lot of money. And like connecting with the community that generally in Athens, we have a hard time connecting with, like basically as white, middle class people. It seems like a school garden would be a really good way to do that, connect with kids, and hopefully be able to connect to their parents. Hopefully get them interested in good food and nutritious food, maybe empowered t o grow their own food, to live a different kind of lifestyle.

Megs talked a lot about future endeavors, hopes, and dreams for the school "as a community place where people congregate, a place that people are drawn to, mostly by the beauty and intrigue of a farm." Although that goal may be long ranging, the local schools are advertised as neighborhood schools and most of the administrators are very welcoming of new people who are just willing and able to help in any way necessary. The culture of the school anyway, seems to fit with her aspirations. Lucy said, "I always think that they're going to yell at us for some reason, like, you're not supposed to be here. But, somebody will pop out and be like, hi." The sense of welcoming they felt from the school inspired them. At the project school, the environment is positive and friendly, partly because they are accustomed

to outsider involvement in the garden efforts. However, the school grounds keepers, which change from school to school, as well as their director andthe assistant superintendent, all have integral parts in maintaining school grounds, and getting their approval can be difficult. Resistance can be found on many levels, even dealing with issues of water accessibility in the garden spaces.

To carry their momentum into the future, Megs and Lucy explained what their plans were for the garden. In addition to a "melon patch that will hopefully be ripe…when the kids are back in school," they are going to "put in strawberries and an edible flower row." They also discussed putting in drought tolerant plants because of the remaining water issues at the school. Although the partnership is in its infancy, there are many opportunities for the future.

Megs is committed to maintaining and sustaining their demonstration garden at the school, but added support could benefit their efforts, particularly in regards to accessing grant funds to purchase needed materials, as well as support for the opportunity to expand their efforts. As an end goal, Megs and Lucy's hopes "would be that the farm at a school could serve kids in the cafeteria, but that it might also produce enough food to serve as a CSA [community supported agriculture] basically. A CSA farm for the families of the students." This way, families could buy shares by volunteering to work the garden, thereby taking produce for their time. In addition, surplus produce could be sold to members in the community to support the garden.

This was also an idea that Ms. Welch mentioned. "There are some kids who get food donations for their family. It would be cool if the school garden could supply something to where families could get a vegetable." The nutrition component

is important for farm to school programs because of the increasing obesity rates and health risks that young children and their families face (Casey, Szeto, Lensing, Bogle, & Weber, 2001; Ebbeling, Pawlak, & Ludwig, 2002; Oxenham & King, 2010). One goal of farm to school programs is to provide fresh produce for consumption, which includes nutrition education and getting healthier meals in schools (Burdette & Whitaker, 2004; The National Farm, 2004). Because there are 31 million students across the nation participating in the lunch program, it is imperative that this happens so that rates of obesity do not continue to increase (Ebbeling, Pawlak, & Ludwig, 2002; Food and Nutrition Service, 2010a).

Because food consumption also occurs at home, it is important to not only educate families, but advocate for their food security. When programs provide food for students to take home, it is not fresh (Finklestein, Hill, & Whitaker, 2008). If food accessibility is increased for families through school gardens and farm to school programs, then education and consumption merge (Heim, Stang, & Ireland, 2009; Nimmo & Hallett, 2008; The National Farm, 2004).

School gardens are a fascinating place for learning (Nimmo & Hallett, 2008). When students are allowed to explore their environments and pursue their interests, the possibilities are endless (Blair, 2009). For school gardens to be successful and additional components like school community hybrids or farm to school programs, it is imperative to create a holistic model (The National Farm, 2004). Standardized curriculum, experiential learning, and collaborative partnerships are all necessary. If a holistic model is used that incorporates all of those, then not only are there many opportunities for learning in the garden, but

students are able to make connections to their lives (The National Farm, 2004). During that process, others are involved and communities can form to ensure that our connection to the earth is not lost (Blair, 2009; Nimmo & Hallett, 2008).

Localized Actions. To foster community collaborations and the possibilities for school gardens, it is important to recognize the funds of knowledge among stakeholders (González, Moll, & Amanti, 2005). I collaborated with a diverse group of community members to address the present state and future possibilities of school gardens. Through my collaboration with this group, I was able to take action and ensure that I shared my experiences in school gardens, while also sharing student and teacher voices. When we initially met, it was clear that we needed to reign ourselves in. Debbie, the director of the local KAB, said, "Am I doing good, or not? I gotta make sure they want this. I gotta make sure that somebody's gonna sustain this." This idea cemented an action that I needed to take, both as a researcher and a member of the community.

Whether talking about curriculum or school buy-in, it is important, as Debbie explained, to "have the support of some of the teachers, and if they've already said no, then I think that conversation needs to be had including them before that decision is made, but it would be great to start laying the framework." To do this, I developed a needs assessment in collaboration with community stakeholders and school administrators. The assessment will be used to identify school garden efforts in the district, as well as staff who want to be involved in the future. This needs assessment informed our work to develop an application process for school gardens. Because support can be difficult to sustain, it is important to identify and

track committed community members (Kingery-Page, Hunt, & Teener, 2010). As a committee, we worked with the Assistant Superintendent to implement a school garden application for anyone interested in beginning or maintaining a school garden. This enables the school district to have full disclosure about what activities are happening on school grounds.

Members of the committee also met with the science coach in the district. Using a holistic approach that integrates gardens into existing curriculum is important to success (Heneman, Junge, Schneider, & Zidenberg-Cherr, 2008). The science coach agreed to upload garden lesson plans into the existing curriculum system, as well as try to include the garden committee into preplanning days for teachers, in order to speak to them about utilizing school gardens. We collaborated with the school because we hoped it would show teachers that they are supported in the district, which is a key component for getting them outside (Kingery-Page, Hunt, & Teener, 2010; Peloso, 2007; The National Farm, 2004). Engaging teachers directly in dialogue about school gardens is a necessary next step, and can hopefully be an action component that will occur due to the assessment and opportunities to attend pre-planning days.

As community actions occur and are planned, it is important to recognize the stakeholders (Kingery-Page, Hunt, & Teener, 2010). Potentially, students, teachers, families, and community members can collaborate to grow gardens (Kingery-Page, Hunt, & Teener, 2010; Nimmo & Hallett, 2008). However, it is important to ensure that actions are informed by past experiences in school gardens. Understanding the available data is paramount to continue striving for growth in the garden.

Strengths & Limitations of this Study

This participatory action research study enabled me to observe and reflect on the many components of school gardens. As a participant in the students' action project, I saw them form a community and share their funds of knowledge (González, Moll, & Amanti, 2005). Observing them as they took action allowed me to provide a thick description of their experience (Geertz, 1973). In previous studies, school gardens were initiated by teachers and more direction was given to the students (Clarke, 2002; Mayer-Smith, Bartosh, & Petarat, 2007). In this study, although the topic was provided by the teacher, the students were encouraged to direct their experiences in the garden.

However, some questions the teachers asked did guide the students in certain directions. Finding a balance between guiding students and truly letting them explore is a limitation of this study because it is difficult to say that everything they did was based on their interests. Although a strength was our collaborative team and community connections, this also is a limitation because community members were often invited because I worked with them outside the school. The students did request help, but we selected who was invited. Although we knew it was not entirely possible to let students direct their learning, we wanted to facilitate a garden experience that they wanted. So, as the students requested help and discussed who to ask, we used their ideas to approach relevant community members, regardless of my relationship with them. In the end, it was important that Nora and I constantly discussed the paths we took to ensure the students were driving our decisions that would ultimately influence their experiences. Family

members were mentioned and invited by the students, but direct collaborations did not work (Heim, Stang, & Ireland, 2009; Nimmo & Hallett, 2008). Interviewing families enabled to me see another side of the school garden experience, and greatly affected my understanding and appreciation of family partnerships in schools. I used teacher, student, community, and family voices directly whenever possible, although some of them either were lost in translation or in the ineffective method of weekly letters to elicit their involvement. The question of how to involve family members is still a work in progress.

To try to create consistency and provide an outlet for discussions at home, I gave each family an herb plant (Subramanium, 2002). However, each family's plant died before the conclusion of the project. I assumed that families would want and know how to care for the plant. I could have provided more instructions to care for the plant, as well as visited the families to discuss the plant's growth. I attempted to inquire about the plant through weekly letters, but most families did not respond. Time was an issue with the plant because I wanted to provide a vegetable they could see produce. However, the space requirements and weather did not permit this to happen (Malone & Tranter, 2003).

In the classroom, a limitation was the structure of enrichment clusters. I only had one hour a week for 9 weeks to spend with them, making it difficult to assess longer-term implications in their learning. Although they accomplished a lot, and learned about extending ownership of the garden to the other students, it would be inspiring to see how much they could have accomplished throughout an entire school year together (Blair, 2009; Clarke, 2002).

Role of Researcher Limitations. As a researcher and participant, it was difficult to navigate my roles in the classroom. Although the students were action researchers in the garden, I was still a researcher observing their communications and interactions. Because I assumed two roles, it was difficult to manage my time. During the cluster period, I was unable to take notes because of the action that was occurring. I had to rely on my audio recordings and memory of the experiences to develop the weekly letters and analysis of the data.

My role in the community could also be a limitation. Before, during, and after the project, I maintained my seat on the community garden board. My relationships with the community participants were both personal and professional, and they often forgot they were participating in my research. I believe this led to richer, deeper, and more open dialogue Because of my connections in the community and on-going advocacy for environmental education and farm to school, it was difficult to know when the project had ended. There was, and still is, not a clear line defining where my personal and professional roles end and begin, making it more difficult to ensure that my voice was not louder than the participants (Charmaz, 2010).

I often found myself negotiating those roles in family interviews as well. Because some of the families were Spanish speaking and more comfortable conversing in their native language, I had a wonderful partnership with Salvador. He visited their homes with me and actively participated in many aspects of the study. Because the letters had to be translated, some things may have been lost in translation. And, although I had conversations with the translator about nuances in language and culture, some aspects of things families were trying to convey in the

interview may have been lost. I tried to alleviate these moments by sharing each family's narrative with them. I asked for feedback, but none was given, so I do not know if I represented them authentically or if they did not feel they could respond due to time, power differentials, or other reasons (Charmaz, 2010).

How the families represented themselves led to other limitations as well. My identity as a white female and a student at the university represented a certain status for families. I noted this during my concluding interviews with families. Although most had not responded to the letters, they all said they were perfect and would not change a thing. As they described how life got in the way, I wondered if they were telling me what I wanted to hear. I may have been viewed as an expert in the classroom, so families may have felt less confident sharing their thoughts and ideas. Additionally, for some families, the hesitancy to speak, even about gardening, could have stemmed from their past experiences in the United States. The consent forms brought this issue to light initially, and the translator mentioned potential issues of immigrant status for one family. Although Salvador provided a sense of trust, the interactions could have been more closed because of fear.

Future Research Possibilities

The interactions between students as they work in the garden should be explored to better understand how communities are formed as they dig in the dirt. Many studies address the relationships that form between students and community members, but not between the students themselves (Nimmo & Hallett, 2008). Understanding more about their interactions over time could include additional

observational data, as well as studies using discourse analysis to deconstruct how students use language together (Heath, Street, & Mills, 2008).

Longitudinal research in school gardens can provide long-term strategies for not only learning, but partnerships as well. Most research explores school gardens over short periods of time, so the implications for maintenance of the garden over time are elusive. In Kingery-Page, Hunt, and Teener, (2010), their experiences in the school garden appeared to have ended after the school demolished their garden due to expansion. But, what happens next? Additionally, there is limited research on family involvement in school gardens. I saw the impact that students had on their families over a 3 month period. However, understanding the dynamics of that impact over time would provide insight into the support that families need to be successfully involved at the school (Davis & Yang, 2005; Nimmo & Hallett, 2008).

It is also important to understand how administrators view partnerships with family and community members. Understanding the impact of school gardens on administration is also important for gardens long-term. In most studies, the administration is mentioned as a challenge (Kingery-Page, Hunt, & Teener, 2010), but their perspective is often neglected. If administrators share their side of the story, then dialogue could be cultivated between them and garden stakeholders. Investigating the dynamics of community partnerships on school districts, not singular schools, could provide insight into the necessary steps for success.

In addition to research possibilities, it is important to remember the work being done on and in the ground. Data, as well as both known and unknown stories from the field can mutually inform future work. As both a researcher and member of

the school garden community, I have shared my data driven experiences in the schoolyard garden. Based on my experiences, as well as unspoken realities while doing the project, I provide recommendations for success in school gardens.

Recommendations for Stakeholders

Each school garden is different, as are the students, families, and community members participating within it. However, it is possible to locate common elements of importance across school gardens. For those already cultivating relationships in the schoolyard, as well as for those just beginning to think about integrating gardens into the schoolyard, these recommendations can help you navigate the landscape. As an action researcher, it was not only important to pursue localized actions, but also to thoughtfully represent how school garden experiences might be more fruitful in our community and others. As such, I have provided recommendations based on my experiences in the garden on how to plan, implement, and evaluate family and community involvement in the schoolyard.

Planning. Before and during the planning stages of a garden project, it is essential to know and understand the environment, as well as the potential stakeholders that might be involved. Understanding the environment includes administrative and teacher expectations regarding learning, particularly considering the time you have to complete the project. In our case, enrichment clusters occurred over a 9-week period in which the project was planned, implemented, and concluded. Understanding the constraints and expectations in your school is essential to success, and stay in constant communication with administration to ensure that expectations are clear.

To involve community stakeholders, it is necessary to do groundwork in terms of accessing the resources that are appropriate for you project. In our garden, community involvement was successful because I had previous experiences with specific individuals that remained consistent during and after the project was complete. In your local area, talk to your local agricultural extension agents and ask for their help. Their job is to provide the community with a range of services, including garden development, and they will be happy to share what they know. Also, talk to school administrators to access resources you may not know about it. Social media tools and the internet also provide access to information and can help connect you to local organizations or individuals who can help. It is important to build a community of people who can support the garden overtime. Although community resources are important, students' families can be an integral source of support in the garden.

I worked in the school garden for a year and a half before implementing this project, and I observed students' actions and listened when they shared their experiences in gardens outside of school. Unfortunately, this information did not directly translate to effective experiences with all of the families in this project. Before I explain why my previous experiences and groundwork did not translate to all families, I will explain why I still consider this project to be a success. It is important to recognize that success with families does not mean success with *every* family. Rose and Mason's families did actively contribute their knowledge to our project from week-to-week. That is success to me. The fact that two families wanted to be involved in the garden experience was worth the effort. So, why was that not

the case in the other families? There could be many answers to this question, but I think it has to do with relevancy. Although I asked the families to participate in the research, I did not directly ask them to be involved in the garden. Nor did I ask the students directly to invite them. To make the experience relevant to families' lives, the students must be involved in helping you make the connection.

To have family involvement in the garden, they must be involved in the planning stages. One way this may be accomplished is through direct recruitment using the students. In the beginning, students could discuss the types of food they eat at home, making the experience one that is potentially culturally relevant. After the discussion, students' homework would enable them to have a similar discussion at home. When students share that information with other students and teachers, a garden plan could begin to form, incorporating the types of food that is commonly consumed at home. During this process, students could also work on building a classroom recipe book that incorporates recipes from each student's home.

Knowing families is also important. Understanding their agricultural backgrounds, as well as how they incorporate agriculture into their present lives can help to build relationships. This is where the groundwork occurs. If families have gardens at home or in their community, try to visit them. I know this takes extra time, but I found out after the fact how important it could have been for our project. Visits can provide you with invaluable knowledge and may show families that you truly are interested in their funds of knowledge. You learn about families' lives when you work with them in *their* space. You can utilize this information in the school garden in many ways. Families could be asked to share their irrigation

techniques, their planting methods, or simply seeds that they have saved from past harvests. However their experiences translate into the school does not matter as long as they feel welcomed to do so, and if you meet them where they are, this is much more likely to occur.

To facilitate learning and sharing in the classroom, ask students to bring in photos of existing family or community gardens. Once that information is shared amongst the students, then the teacher can facilitate the integration of family funds of knowledge into the garden landscape. If funds of knowledge are known and utilized, the learning process can be become relevant, particularly if students work with their families side-by-side in the garden.

Learning is relevant when students and families take action. If you direct what will happen and how, then it may progress in unwanted directions. If you ask students, why are you here, what is the goal of your garden…then it becomes relevant. If it was their idea to begin with, then they will make it work, and it is not forced. This must be your mantra when implanting the garden plan.

Implementation. When teachers, students, and other participants are ready to build the garden, flexibility is important to success. Ask family and community members about their availability and then plan a garden workday around the best times. If the turnout is good, keep this as a normal workday. The more that garden activities are integrated into participants' lives, the easier it will be to build a community within it. From week-to-week, it is known that someone will be in the garden. This may mean that working in the garden occurs before, after, or during the school day, and might even mean the weekend. It is work, but it is worth it.

During our garden project, I wrote weekly letters to families. Although successful with one family, their informational nature was not engaging and were ineffective for dialogue. As I wrote letters, I provided an overall picture of the activities during one meeting. I did not want to leave anything out about what we did each cluster meeting. This was probably overwhelming for families, and I could have chosen just the highlights to achieve more response from them.

If teachers want to be responsible for letters, focus on one topic and make them attractive. Include photographs or photocopies of student work so that there is visual interest. The topic can be selected by the teacher, or by the students. Simply ask students what their favorite part of the day was and focus on that when writing to families. Not only does this help families know what you may need help with, or provide their feedback, but it helps stimulate conversations at home because the students are excited about that activity.

The other option is for students to write the letters. In addition, think of the appropriate vessel for the letters. If written on single pieces of paper, the potential for loss is higher, and it may not invite a response. However, if journals are used, students take ownership over their journals, and families may be more invested in providing a response because they can see the growth in the knowledge shared over a period of time. Students could write letters as problems are identified in the garden, helping to alleviate the disconnect that occurred in our garden. Not only are students writing about what they identify with most in the garden, but it also helps with time because teachers are not responsible.. If students write families directly, then the process is more relevant and conducive to dialogue.

Regardless of the communication method, the letters should be integrated into the classroom. Just as garden workdays should be normalized into the landscape, so should letters. Our letters were never shared as a class. I think that if we had shared the letters with students, they might have been more inclined to discuss their experiences at home and requested that their families be more involved, directly or indirectly.

In addition to the letters, other forms of documentation in the garden are important. Take photographs or videos of the students' work in the garden. Consistent documentation not only provides an overall view of the experience, but can also act as a catalyst for further involvement. Include the photographs in the weekly letters so that families actually *see* what is happening. This information also helps bring the garden to life and makes it easier to evaluate the experience.

Evaluation. Do not forget about this step. Reflect on the process, beginning with the planning stage. Did you do the groundwork? Think about what the students learned, and whether the period of time was sufficient. If you plan an enrichment cluster garden experience, think about requesting the same students to create consistency. If the garden is integrated into your classroom, consider how time was allotted in the classroom. It is also important to ask the administration for their input. If more stress needs to be put on learning, ask for help and resources that can assist you in integrating standardized curriculum into the garden experience. I promise it is possible.

During implementation, did you access family funds of knowledge? If so, remember what worked. Although it probably will not work exactly the same in

future iterations of the project, the information can still inform what happens later in the garden. If funds of knowledge were not accessed, what would help? Recognize where the breakdown occurred and reflect.

If families are utilized in the planning and implementation stages of the garden, then evaluation is easy. Along the way, if there are issues with the irrigation, soil, plants, pests, construction, etc., then adjustments can be made. In addition, as experiences in the garden occur, the process will evolve over time and may turn into something completely different from when it began. This is okay! Although we may proceed in the garden with a specific method of working, or a certain outcome in mind, that might not be what others want. As garden guides, it is our responsibility to pay attention to those working with the garden. This is particularly important to long-term success because if the direction the garden takes is not wanted, then participation in it may stop completely.

Reflections for the Future

At the beginning of my inquiry, my hope was that the students would learn about gardening and reconnect them with the earth so they could grow as socially responsible citizens. I hoped that they would be inspired to take action, and I think they did. As I worked with them week after week and observed their actions, listened to their questions, and watched them wrestle with ideas, it was clear that we all learned. As a community of learners, both teachers and students' roles in the classroom evolved and we learned from each other. As participants in the action project, we shared our funds of knowledge and creating new meanings.

As a researcher, I paid attention to what their realities were of the garden, particularly how they related their experiences between school and their home communities. Using a sociocultural perspective, I was able to understand how students impacted each other with their own social and cultural experiences, building a community that constantly exchanged information and wanted to influence their community (Rogoff, 2003). I also saw how family and community members influenced the students. But most importantly, I saw the reciprocal relationships that formed between everyone to continue taking action in the garden.

The students inspired me to continue building collaborative partnerships with communities. I will continue to foster positive, beneficial relationships between community advocates and school personnel so that gardens are integrated into the curriculum and the classroom is brought outdoors (Lo, Affolter, & Reeves, 2002; No Child, 2001). I hope to open the doors of schools and allow students access to nature where they can learn (Miller, 2007). In fact, I may encounter these students again next year, as I have already volunteered to work in the garden this fall.

I hope the students continue to build on their interests and learn at home. They inspired their families to grow gardens, and they inspired me to continue cultivating my garden so that I can understand the process that young children and families may experience while digging in the dirt. Reconnecting to the earth is an important aspect of this project for me, and allowed me to see the possibilities that exist in the schoolyard.

And most of all, as the health of our nation continues to be in peril, I hope that school gardens can be used for nutrition education so that students do know

where their food comes from (Berkowitz, Ford, & Brewer,2005) . As they are educated, students can become advocates for their health and call for change. Fresh, healthy food should be accessible for everyone (Heim, Stang, & Ireland, 2009). If relationships are fostered between local farmers and schools, then costs associated are not prohibitive (Joshi, Azuma, & Feenstra, 2008). The reciprocal relationship between the food producer and consumer can be mutually beneficial and hopefully lead to a healthier generation of children (USDA, 2010a; USDA 2010b).

I will do my part in the community to make this a reality. Salvador suggested that I work in the community garden located where most of the students live, and I will. Working with the families in the garden will enable me to build relationships, and not lose sight of why agriculture is so important to me. Also, farm to school is no longer a possibility, but a reality. When locally produced items are served in the cafeteria, I will celebrate and tell the students that they did this. They took action together and initiated a social transformation.

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APPENDICES

Appendix A: Participation Invitation

Hello families!

Greetings from Broccoli, Collards, and Squash, oh my!

My name is Melissa Kozak and I will be working with your child in the vegetable cluster from January to March. I would love to get to know you better and what you think of our garden. I am studying what the children learn about gardening, and how you can help us by sharing what you know.

If you are interested in participating, please respond on this paper, email me, or call.

I look forward to hearing from you!

Sincerely,

Melissa Kozak

melli@uga.edu

832-482-5771

Appendix B: Recruitment

Verbal Recruitment of Families

Researcher: Hi, my name is Melissa Scott Kozak and I am calling because your child has signed up to be a part of the Vegetable Garden Cluster. I am a graduate student at UGA, and I have been working with Mrs. Carnes on the vegetable garden for a year. I am doing a research project this year to understand more about how and what the students are learning. I am especially interested in discovering how your knowledge and involvement helps the students learn. Would it be okay if I visited you at your home to tell you more about the study? I will bring the consent form and parental permission forms with me for you to look over, and you can agree or not agree to participate. If that is not okay, I understand. You are under no obligation to participate.

Email Recruitment of Community Members

Researcher: Hi, my name is Melissa Scott Kozak, and I am emailing you because I am working on a school vegetable garden with a first grade teacher. I am also a graduate student, and I will be studying how and what children learn about vegetable gardening, as well as how family and community involvement influences learning. I have emailed some of you previously to ask if you would like to help in the garden, but I did not mention the research aspect yet because I did not have formal approval. If you are still interested in helping in the garden and would like to hear more about the study, I would like to meet with you to go over the consent forms. If not, that is okay. You are under no obligation to participate.

Verbal Recruitment of Teachers

Researcher: Hi, my name is Melissa Scott Kozak, and I am visiting you today because I have formal approval to begin the research study about the garden. As you know, I want to understand how and what the students learn, and how family and community involvement influences learning. I would like to include you as well in the study, through observations and interviews. I want to see how you view the garden project. If that is okay, I can go over the consent forms in more detail. If not, I completely understand. You are not obligated to participate.

Appendix C: Parental Permission Form

I agree to allow my child, _____, to take part in a research study titled, "Cultivating Partnerships and Putting Down Roots: Family and Community Involvement through Vegetable Gardening", which is being conducted by Mrs. Melissa Scott Kozak, from the Child and Family Development Department at the University of Georgia (832-482-5771) under the direction of Mr. David Wright, Ph.D. in the Child and Family Development department (706-532-4825). I do not have to allow my child to be in this study if I do not want to. My child can refuse to participate or stop taking part at any time without giving any reason, and without penalty or loss of benefits to which she/he is otherwise entitled. I can ask to have the information related to my child returned to me, removed from the research records, or destroyed.

- The reason for the study is to understand how and what children learn about vegetable gardening, and how family and community involvement influences learning opportunities.
- Children who take part will have family members participating. The researcher also hopes to learn the most effective ways to include family and community members in the school gardening process.
- If I allow my child to take part, my child will participate in normal classroom activities during enrichment clusters as he/she signed-up. My child will be audio-taped during these times, which will happen throughout the 10 week period of clusters.
    - Audio tapes will be kept in a secure location for 5 years and only the researcher and research advisor will have access to them. The tapes will not be publicly disseminated unless I specify below that individually-identifiable data can be made public.
- My child may also be asked additional questions about activities in and outside of school one-on-one with the researcher. These questions will be asked during classroom time and will not interfere with my child's learning. If I do not want my child to take part then she/he will be allowed to not participate.
- As a participant, my child will receive a plant to take care of at home.
- The research is not expected to cause any harm or discomfort. My child can quit at any time. My child's grade will not be affected if my child decides not to participate or to stop taking part.
- Any individually-identifiable information collected about my child will be held confidential unless otherwise required by law. Please select the option you would like:

  _____My child's identity will be coded, and all data will be kept in a secured location. Individually-identifiable data will not be made public and only the researcher and advisor will have access. Any identifiers will be destroyed in 5 years.

  _____My child's identity will be not be coded. Individually-identifiable data can be made public.

The researcher will answer any questions about the research, now or during the course of the project, and can be reached by telephone at: 832-482-5771. I may also contact the professor supervising the research, Dr. David Wright, Child and Family Development Department, at 706-532-4825.
I understand the study procedures described above. My questions have been answered to my satisfaction, and I agree to allow my child to take part in this study. I have been given a copy of this form to keep.

_____	_____	_____
Name of Researcher	Signature	Date

Telephone: _____
Email: _____

_____	_____	_____
Name of Parent or Guardian	Signature	Date

Telephone: _____
Email: _____

Please sign both copies, keep one and return one to the researcher.

Additional questions or problems regarding your child's rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 629 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu

Appendix D: Family Consent Form

I, _____, agree to take part in a research study titled "Cultivating Partnerships and Putting Down Roots: Family Involvement through Vegetable Gardening", which is being conducted by Melissa Scott Kozak, Child & Family Development, UGA, (832) 482-5771 under the direction of Dr. David Wright, Department of Child and Family Development, UGA, **dwright@fcs.uga.edu***. My participation is voluntary; I can refuse to participate or stop taking part at any time without giving any reason, and without penalty or loss of benefits to which I am otherwise entitled. I can ask to have information related to me returned to me, removed from the research records, or destroyed.*

The reason for the study is to understand how and what children learn about vegetable gardening, and how family and community involvement influences learning opportunities.

The benefits that I may expect from it are: children and families will gain knowledge together in an engaging way, allowing them to work together as a community of learners. The researcher does not foresee any discomfort or stress as a result of this study, or risks to the participants.

If I volunteer to take part in this study, I will be asked to do the following things:

- I will respond to weekly journals with the researcher. These journals will talk about what my child did in clusters that week and will ask for my input.
- I will meet with the researcher at my home, at a time that I designate for one-hour, 3 times.
    - At least two days prior to each meeting, the researcher will e-mail me a copy of an interview/question guide so that I may look over the topic to be discussed.
- During the first meeting at my home, the researcher will talk to me about the study.
- During the second meeting at my home, the researcher will interview me about my thoughts about the project.
- During the third meeting at my home, the researcher will interview me about my final thoughts at the conclusion of the project.
- When the interview takes place, the interview guide will be used as a basis, but follow-up and/or additional questions may be asked.
- The interviews will be recorded with an audio device if I give consent. The transcription will take place in a private location and confidentiality will be maintained.
    - Audio tapes will be kept in a secure location for 5 years and only the researcher and research advisor will have access to them. The tapes will not be publicly disseminated unless I specify below that individually-identifiable data can be made public.
- If I do not have a vegetable plant at home, I will be given one to care for with my child.

- I may be invited to participate during cluster time or during work days at school. Clusters will occur every Thursday at 1 p.m. I do not have to participate.
- Please select the option you would like:

  _____ My identity will remain confidential, and my participation will be kept private. Individually-identifiable information about me will be used so the researcher and research advisor only can identify me, unless it is to protect my rights or welfare (for example, if I am injured and need emergency care or child abuse is witnessed); or if required by law. Individually-identifiable data will not be made public and only the researcher and advisor will have access. Any identifiers will be destroyed in 5 years.

  _____My identity will be not be coded. Individually-identifiable data can be made public.

The researcher will answer any further questions about the research, now or during the course of the project, and can be reached by telephone at: (832)482-5771.
My signature below indicates that the researchers have answered all of my questions to my satisfaction and that I consent to volunteer for this study. I have been given a copy of this form.

_____	_____	_____
Name of Researcher	Signature	Date
_____	_____	_____
Name of Participant	Signature	Date

Additional questions or problems regarding your rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 629 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu

Appendix E: Student Assent Form

My name is Melissa Scott Kozak. I am trying to learn about you and the vegetable garden because I want to find out how and what you learn about gardening, especially because your parents are participation. I want to see what information they share with you or the class. If you would like, you can be in my study.
If you decide you want to be in my study, you will STILL come to clusters every Thursday and participate in the classroom activities. I might ask you questions while you are sitting at a table working by yourself or with a group.
You might not feel like talking to me, or you might not want to share your ideas. But, if we can talk about what you are doing, then we can learn from each other.
If you want to be in the study, I will give your parents a plant for you to care for at home if you do not have one.

Other people will not know if you are in my study unless you want them to know, or your parents say it is okay. I will put things I learn about you together with things I learn about other students in your classroom, so no one can tell what things came from you. When I tell other people about my research, I will not use your name if you do not want me to, so no one can tell who I am talking about.

Your parents or guardian have to say it's ok for you to be in the study. After they decide, you get to choose if you want to do it too. If you don't want to be in the study, no one will be mad at you. If you want to be in the study now and change your mind later, that's ok. You can stop at any time.

My telephone number is 832-482-5771 and my email is melli@uga.edu. You can call or email me if you have questions about the study or if you decide you don't want to be in the study any more.

I will give you a copy of this form in case you want to ask questions later.

Agreement

I have decided to be in the study even though I know that I don't have to do it.
Melissa Scott Kozak has answered all my questions.

_____ _____
Signature of Study Participant Date

_____ _____
Signature of Researcher Date

Appendix F: Teacher Consent Form

I, _____, agree to take part in a research study titled "Cultivating Partnerships and Putting Down Roots: Family Involvement through Vegetable Gardening", which is being conducted by Melissa Scott Kozak, Child & Family Development, UGA, (832) 482-5771 under the direction of Dr. David Wright, Department of Child and Family Development, UGA, dwright@fcs.uga.edu*. My participation is voluntary; I can refuse to participate or stop taking part at any time without giving any reason, and without penalty or loss of benefits to which I am otherwise entitled. I can ask to have information related to me returned to me, removed from the research records, or destroyed.*

The reason for the study is to understand how and what children learn about vegetable gardening, and how family and community involvement influences learning opportunities.

The benefits that I may expect from it are: children, families, and community members will gain knowledge together in an engaging way, allowing them to work together as a community of learners. The researcher does not foresee any discomfort or stress as a result of this study, or risks to the participants.

If I volunteer to take part in this study, I will be asked to do the following things:

- I will meet with the researcher at a time and place that I designate for one-hour, 1 time.
    - At least two days prior to each meeting, the researcher will e-mail me a copy of an interview/question guide so that I may look over the topic to be discussed.
- During this interview, I will be asked to talk about my participation in the classroom and my observations of the students' learning.
- When the interview takes place, the interview guide will be used as a basis, but follow-up and/or additional questions may be asked.
- The interview will be recorded with an audio device if I give consent. The transcription will take place in a private location and confidentiality will be maintained if I choose.
    - Audio tapes will be kept in a secure location for 5 years and only the researcher and research advisor will have access to them. The tapes will not be publicly disseminated unless I specify below that individually-identifiable data can be made public.
- Please select the option you would like:

  _____ My identity will remain confidential, and my participation will be kept private. Individually-identifiable information about me will be used so the researcher and research advisor only can identify me, unless it is to protect my rights or welfare (for example, if I am injured and need emergency care or child abuse is witnessed); or if required by law. Individually-identifiable data will not be made public and only the researcher and advisor will have access. The data will be destroyed in 5 years.

_____My identity will be not be coded. Individually-identifiable data can be made public.

The researcher will answer any further questions about the research, now or during the course of the project, and can be reached by telephone at: (832)482-5771.

My signature below indicates that the researchers have answered all of my questions to my satisfaction and that I consent to volunteer for this study. I have been given a copy of this form.

_____	_____	_____
Name of Researcher	Signature	Date

_____	_____	_____
Name of Participant	Signature	Date

Additional questions or problems regarding your rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 629 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu

Appendix G: Community Consent Form

I, _____, agree to take part in a research study titled "Cultivating Partnerships and Putting Down Roots: Family Involvement through Vegetable Gardening", which is being conducted by Melissa Scott Kozak, Child & Family Development, UGA, (832) 482-5771 under the direction of Dr. David Wright, Department of Child and Family Development, UGA, dwright@fcs.uga.edu*. My participation is voluntary; I can refuse to participate or stop taking part at any time without giving any reason, and without penalty or loss of benefits to which I am otherwise entitled. I can ask to have information related to me returned to me, removed from the research records, or destroyed.*

The reason for the study is to understand how and what children learn about vegetable gardening, and how family and community involvement influences learning opportunities.

The benefits that I may expect from it are: children, families, and community members will gain knowledge together in an engaging way, allowing them to work together as a community of learners. The researcher does not foresee any discomfort or stress as a result of this study, or risks to the participants.

If I volunteer to take part in this study, I will be asked to do the following things:

- I will participate in cluster time (Thursdays at 1 p.m.) at the school at least one time.
    - My participation will involve an area of expertise related to vegetable gardening.
- I will meet with the researcher at a time and place that I designate for one-hour, 1 time.
    - At least two days prior to each meeting, the researcher will e-mail me a copy of an interview/question guide so that I may look over the topic to be discussed.
- During this interview, I will be asked to talk about my participation in the classroom and my background in vegetable gardening.
- When the interview takes place, the interview guide will be used as a basis, but follow-up and/or additional questions may be asked.
- The interview will be recorded with an audio device if I give consent. The transcription will take place in a private location and confidentiality will be maintained if I choose.
    - Audio tapes will be kept in a secure location for 5 years and only the researcher and research advisor will have access to them. The tapes will not be publicly disseminated unless I specify below that individually-identifiable data can be made public.
- Please select the option you would like:

  _____ My identity will remain confidential, and my participation will be kept private. Individually-identifiable information about me will be used so the researcher and research advisor only can identify me, unless it is to protect my rights or welfare (for example, if I am injured and need emergency care or child abuse is witnessed); or if required by law.

Individually-identifiable data will not be made public and only the researcher and advisor will have access. Any identifiers will be destroyed in 5 years.

_____My identity will be not be coded. Individually-identifiable data can be made public.

The researcher will answer any further questions about the research, now or during the course of the project, and can be reached by telephone at: (832)482-5771.
My signature below indicates that the researchers have answered all of my questions to my satisfaction and that I consent to volunteer for this study. I have been given a copy of this form.

_____	_____	_____
Name of Researcher	Signature	Date

_____	_____	_____
Name of Participant	Signature	Date

Additional questions or problems regarding your rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 629 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu

Appendix H: Interview Protocol #1 for Family

Hello, my name is Melissa Scott Kozak, and I am a Ph.D. student in the Child and Family Development Department at The University of Georgia. I am working with a teacher this year on a classroom vegetable garden to address children's interest in gardening. I am interested in understanding how and what children learn about vegetable gardening, as well as how family and community members involvement may encourage or facilitate knowledge and interest. This afternoon, I would like to talk to you about your personal experiences with gardening and learn more about what you do at home and in your community, particularly involving your children. The questions that you received will guide us through the interview but as either of us have questions, we can address those.

Before we begin, I just want to go over a few things. This interview should last one hour and will be audio recorded, as stated in the consent form that you signed. Again, all information that you share will be kept confidential if that is what you request. If at any time during the interview there is a question that you do not want to answer, please alert me and I will move on. Do you have any questions before we begin?

I. Background Information

1.) Background Information (I will use a-d as a checklist/probes)

To start, I would like to gather some background information; could you please tell me a little bit about yourself and your family?

a. What is your name?

b. What is your country of origin?

c. Where do you work? How long?

II. Gardening Knowledge

2.) As I stated, I would like to learn about your knowledge of gardening. Please tell me a little bit about your experiences.

III. School Involvement

3.) How have you become involved with your child(ren)'s school?

a. Classroom?

4.) How did you get involved?

a. Facilitated by the school, yourself?

5.) What things have you participated in at the school (or classroom)?

6.) Have you experienced any challenges in participating at the school?

7.) Have you experienced any triumphs, if so what are they?

a. How has the community/family responded?

b. How have the children responded?

IV. Community Involvement

8.) What is your definition of community?

9.) Where is your community?

10.) How have you been involved?

a. Facilitated by what?

11.) What things have you participated in within your community?

a. Outside?

b. I would like to learn about how you involve the community/family, if at all?

12.) How have you involved your family?

13.) Have you experienced any challenges as you participate in the community?

14.) Have you experienced any triumphs, if so what are they?

a. How has the community/family responded?

b. How have the children responded?

V. Wrap-up

15.) Is there anything you would like to add?

Thank you for sharing your ideas and experiences with me. If I have any further questions, may I contact you again?

Appendix I: Interview Protocol #2 for Family Members

Hello again, it has been wonderful getting to know you and your family. As you know, I have been conducting a research study on how and what children learn about vegetable gardening, as well as the role that family and community members may play in facilitating or encouraging children's knowledge and interest. This afternoon, I would like to talk to you about your personal experiences with the vegetable garden at school and with the project overall. The questions that you received will guide us through the interview, but as either of us have questions, we can address those.

Before we begin, I just want to go over a few things. This interview should last one hour and will be audio recorded, as stated in the consent form that you signed. Again, all information that you share will be kept confidential if that is what you request. If at any time during the interview there is a question that you do not want to answer, please alert me and I will move on. Do you have any questions before we begin?

I. Garden Experience

1. How did you participate in the vegetable garden your child was involved in at school?
2. How did you perceive the experience?
3. What did you learn?
4. What information did you share?
5. What did you think about the response journals?
    a. Helpful?

b. Tedious?

6. How did the response journals impact your involvement in the garden?
7. What is your perception of your child's knowledge after participating in the garden?
8. Would you encourage them to continue working in the garden?

II. Follow-up from Interview 2

9.) Have you experienced any challenges in participating at the school?

10.) Have you experienced any triumphs, if so what are they?

a. How has the community/family responded?

c. How have the children responded?

III. Community Involvement

11.) What is your definition of community?

12.) Where is your community?

13.) How have you been involved?

a. Facilitated by what?

14.) What things have you participated in within your community?

a. Outside?

b. I would like to learn about how you involve the community/family, if at all?

15.) How have you involved your family?

16.) Have you experienced any challenges as you participate in the community?

17.) Have you experienced any triumphs, if so what are they?

a. How has the community/family responded?

d. How have the children responded?

IV. Wrap-up

18.) Is there anything you would like to add?

Thank you for sharing your ideas and experiences with me. If I have any further questions, may I contact you again?

Appendix J: Interview Protocol for Teacher

Hi. I have enjoyed working with you on the vegetable garden enrichment cluster. I would also like to thank you for allowing me the opportunity to interview you about the process of planning and implementing it. As you know, I am interested in understanding how and what children learn about vegetable gardening, as well as how family and community involvement may encourage or facilitate knowledge and interest. This afternoon, I would like to talk to you about the process of developing and implementing the garden thus far, and your expectations of the project. The questions that you received will guide us through the interview, but as either of us have questions, we can address those.

Before we begin, I just want to go over a few things. This interview should last one hour and will be audio recorded, as stated in the consent form that you signed. Again, all information that you share will be kept confidential if that is what you request. If at any time during the interview there is a question that you do not want to answer, please alert me and I will move on. Do you have any questions before we begin?

I. Background Information

1.) Background Information (I will use a-d as a checklist/probes) Could you please tell me a little bit about yourself and your classroom?

a. What is your name?

b. What is your educational background?

c. Where do you work? How long?

d. What grade do you teach?

II. Vegetable Garden

3.) Please tell me about the garden you have implemented in your classroom?

4.) How did you get involved in it? (I will use a-b as checklist/probes)

a. Educational experiences?

b. Daily life?

5. What methods have you used to teach the children about gardening?

a. Standards?

b. Interest of children?

6. Have you used other methods to facilitate learning experiences in your classroom(s)?

a. How do you involve the community/family, if at all?

7. Have you seen any other methods used by other teachers, If so, how?

8. Sometimes, it can be difficult to gain the support of your school administrators. How did you perceive that process in your school thus far? (I will use a-b as checklist/probes)

a. If it was positive, how did you sustain their support?

b. If it was negative, how did you gain and sustain their support?

9. Please describe the overall process of implementing this opportunity in your school thus far, thinking about administrators, colleagues, students, and families.

a. Have you experienced any challenges in starting, implementing, and maintaining the ecological literacy opportunities, if so what are they?

b. Have you experienced any triumphs, if so what are they? Do you foresee any?

c. How have your colleagues responded thus far, and how do you perceive their response in the future?

d. How has the community/family responded thus far, and how do you perceive their response in the future??

e. How have the children responded thus far, and how do you perceive their response in the future?

10. How have family members been involved?

11. How have community members been involved?

12. What have you noticed about children's learning when family and community members are involved?

13. What have children learned?

III. Wrap-up

14. Do you have any suggestions/tips for others who are trying to implement school gardens?

15. Is there anything you would like to add?

Thank you for sharing your ideas and experiences with me. If I have any further questions, may I contact you again?

Appendix K: Interview Protocol for Student Teacher

Hi. I have enjoyed working with you on the vegetable garden enrichment cluster. I would also like to thank you for allowing me the opportunity to interview you about your experiences in the classroom. As you know, I am interested in understanding how and what children learn about vegetable gardening, as well as how family and community involvement may encourage or facilitate knowledge and interest. This afternoon, I would like to learn more about your experiences in the classroom with the children, as well as your perception of the garden cluster. The questions that you received will guide us through the interview, but as either of us have questions we can address those.

Before we begin, I just want to go over a few things. This interview should last one hour and will be audio recorded, as stated in the consent form that you signed. Again, all information that you share will be kept confidential if that is what you request. If at any time during the interview there is a question that you do not want to answer, please alert me and I will move on. Do you have any questions before we begin?

III. Background Information

1.) Background Information (I will use a-d as a checklist/probes) Could you please tell me a little bit about yourself and your classroom?

e. What is your name?

f. What is your educational background?

g. Where do you work? How long?

h. What grade do you teach?

2.) Please tell me about the vegetable garden cluster.

3). How did you get involved in it?

4). Are you interested in gardening? (I will use a-b as checklist/probes)

a. Educational experiences?

b. Daily life?

5. What methods have you observed being used to teach the children about gardening?

c. Standards?

d. Interest of children?

6. How have family members been involved?

7. How have community members been involved?

8. What have you noticed about children's learning when family and community members are involved?

9. What have children learned?

10. Have you observed any challenges or triumphs?

11. Do you have suggestions to address any issues you observed?

12. Do you have suggestions to enhance children's learning?

III. Wrap-up

13. Is there anything else you would like to add?

Thank you for sharing your ideas and experiences with me. If I have any further questions, may I contact you again?

Appendix L: Interview Protocol for Community Members

Hello, my name is Melissa Scott Kozak, and I am a Ph.D. student in the Child and Family Development Department at The University of Georgia. I am working with a 1st grade teacher this year on a classroom vegetable garden to address children's interest in gardening. I am interested in understanding how and what children learn about vegetable gardening, as well as how family and community members involvement may encourage or facilitate knowledge and interest. This afternoon, I would like to talk to you about your involvement in a community organization and what you do at home and in your community. The questions that you received will guide us through the interview, but as either of us have questions, we can address those.

Before we begin, I just want to go over a few things. This interview should last one hour and will be audio recorded, as stated in the consent form that you signed. Again, all information that you share will be kept confidential if that is what you request. If at any time during the interview there is a question that you do not want to answer, please alert me and I will move on. Do you have any questions before we begin?

I. Background Information

1.) Background Information (I will use a-d as a checklist/probes)

To start, I would like to gather some background information; could you please tell me a little bit about yourself and your organization/affiliation?

a. What is your name?

b. What is your educational background?

c. Where do you work? How long?

d. How did you get involved in this idea (what they call their project [of promoting local agricultural and cultural experiences?])? (I will use a-b as checklist/probes)

i. Educational experiences?

ii. Daily life?

II. Involvement in School

2.) You were invited to participate in the school garden. Please tell me a little bit about what you talked about with the children.

3.) How did you perceive the experience?

a. How did you feel about the children's engagement?

b. What do you think they learned?

4.) How do you think other community members could be involved?

5.) How do you think family members could be involved?

6.) How have you participated in other school activities?

a. Other schools?

7.) Have you experienced any challenges in participating in school activities?

a. Have you experienced any triumphs?

8.) How are you involved in your community?

III. Wrap-up

9.) Do you have any suggestions/tips for others who advocate for educational opportunities like this?

10. Is there anything you would like to add?

Thank you for sharing your ideas and experiences with me. If I have any further questions, may I contact you again?

Appendix M: Weekly Letters

Hello families!

Last Thursday was the first day of Broccoli, Collards, and Squash, oh my! The students told their peers why they chose to be involved in the vegetable gardening cluster. Some said it was just because they liked vegetables and others thought it would be fun. Please tell us what you think about the cluster. Why are vegetable gardens important to you? How do you think they apply to your life?

To get started, we played a game to see when certain fruits and vegetables can be planted. We found out that we can't plant as much during the winter, and that A LOT grows in the spring and summer. Did your child talk about this? If not, ask them what they remember. Please tell us what you know about the growing seasons!

We also took a tour of our garden to think about what we can do during our time together. At first they were very excited to see that we still have broccoli and collard greens growing, even after the snow! Because it is so cold, they thought the plants might need something to keep them warm. Then they noticed the lack of soil in our beds and that the garden needs to be cleaned.

We are still working on a plan to get the garden ready, so we would love to hear from you. What ideas do you have for us?

We have a lot to learn, and we would love to hear from you! Thanks for sharing with us!

Hello families! Greetings from Broccoli, Collards, and Squash, oh my!

Last week we taste tested local vs. far away tomatoes, blueberries, lettuce, and carrots. The kids loved it! Before we started, they thought that most vegetables they eat were grown in Georgia. We talked about why that might not be the case. What about you? Do you have access to fruit and vegetables grown nearby?

Then, we watched the blueberries fly all the way from Chile to Athens on Google Earth, and they were shocked to know their food came from so far away. What do you think about this? Why does our food come from far away?

Once we tasted the food, they really liked the carrots, but were not very excited about the lettuce. Overall, we decided we liked produce that was grown locally. They said the blueberries were much juicier from Athens than Chile, maybe because they didn't have to sit on a plane and truck. What do you think? Do you think you would enjoy local produce more, why or why not?

We have a lot to learn, and we would love to hear from you! Thanks for sharing with us!

Hello families! Greetings from Broccoli, Collards, and Squash, oh my!

Last week we worked really hard to make plans for the garden. The kids decided they wanted to make sure that more vegetables were planted in the garden. They're also interested in planting fruit plants and trees, but we need to do more research to see if it's possible. Can you share what you know about planting fruit with us?

Take this time to visit your herb plant and discuss changes in it with your child.

1. Has it grown?
2. What have you done to make it grow?
3. How does it look, compared to the day you received it?

With all the plans that we have for the garden, we decided we definitely need help! They decided that we need an irrigation system and a green house, but we don't have much experience. Please help us by sharing what you know, or by providing some ideas about who could help. We would really LOVE it!

We look forward to sharing your input, thanks again!

Hello families! Greetings from Broccoli, Collards, and Squash, oh my!

Some exciting things have happened since last week. We received $200 from Keep Athens Clarke County Beautiful & Green Schools to buy supplies for our garden, and they're going to give us free compost! We are so grateful to have a community organization that will help make this garden great for the kids.

We also received supplies from JJ Harris for the garden , including seed trays, water hoses, shovels, pots, and garden tools. The kids were really excited to see all our garden supplies piled in the back of the room, and they cannot wait to use them! What do you think about their generosity? Do you know about the Green Schools program?

And guess what? We planted seeds last week! We poured water into our seed trays and watched the soil pellets get big and plump. Then, all of the kids helped plant the seeds in the soil. Can you guess what we planted? They decided on radishes, broccoli, kale, turnips, cabbage, jalapenos, and much more. What do you think of our selection?

To make sure they grow, they decided to put them by the window. We're excited to see what has happened to them since last week.

Have you used seed trays? With all of the wonderful weather, how long do you think we'll have to wait to put them in our garden?

We also had to take our flower bulbs to the compost; they were getting quite smelly! Do you compost anything? Could you tell us what you know about compost; what do we need to really get it going?

Please let us know what you think, we're eager to share your ideas with the class ☺

Hello families! Greetings from Broccoli, Collards, and Squash, oh my!

We have been busy! We looked at the kids' plan and decided to check some things off our list. One group went outside with Melissa and worked on the scarecrow. It involved lots of shoveling in *really* hard dirt, but they did great! They worked together to make sure the scarecrow had a stable place to sit. We're still having problems getting his head to stay on; do you have any ideas to help us?

The other groups worked on letters to their families and community members. The students wrote about how important growing food was to them and that they need help to continue the garden work. Is it important to you to grow food, why? We still have not selected exactly where the letters will go; do you have ideas for us?

In the letters to families, the students wrote about how community members are going to help us and some things they are going to do. We do have plans for someone to visit us this week to talk about worms, so they're really excited. They also wrote about some of the things we have been working on, like planting seeds and composting.

How has your child talked about the garden? Have they mentioned all of the hard work they have been doing?

In all of the letters, they mentioned how it is good for the earth to grow food. What do you think about this? How does gardening help the earth? Does it help anything else?

As always, we look forward to sharing your ideas and can't wait to hear your thoughts!

Hello families! Greetings from Broccoli, Collards, and Squash, oh my!

When we first started this project, the kids said they wanted to make sure we had worms in the garden so they could help our vegetables grow. Can you tell us what you know about what worms can do? We're still learning, but we know they can aerate our soil. Do you use, or know of anything else that we could use to do that?

We told some people in the community that we wanted to learn about worms, and they said they would love to help! So, a friend from the Agricultural Extension office visited us in class and brought an entire bin of worms!

We broke into groups to make our own habitat for the worms. One group helped drill holes for air, and another glued mesh over the holes to make sure they don't escape. The kids learned that worms can make a good home in wet newspaper, so another group made sure we had strips of newspaper in our plastic bin and then mixed water into it.

Once that was done, another group carefully moved red wiggler worms from our friend's bin into the classes' bin. They were so excited to search for the worms among the soil. They asked why her bin had soil and ours didn't. She told us that the worms eat the newspaper and make worm castings when they digest it; eew! What do you think about this?

We talked about how we can put other vegetables and fruit into the bin and then use the worm castings in our garden. Have you used, or heard of other things we can put in our garden to make the soil better for the plants?

We would love for you to see our worm bin if you have a chance!

Hello families! Greetings from Broccoli, Collards, and Squash, oh my!

Wow, were we busy last week! The kids came in ready to work and they got a lot done in one hour. Keep Athens Clarke County Beautiful offered to donate compost and it was delivered from the landfill last Tuesday.

Our first job was to shovel the compost into our garden beds so we could begin planting. With shovels in many hands, they worked together to fill 3 beds. While some were shoveling, others were getting the seedlings ready for planting. They've grown so much in 2 weeks and were definitely ready for some more space. If you have planted before, what do you look for in plants to know when they're ready to be planted outside?

The kids carefully plotted where the plants would go, and made sure we put our plant labels in the beds so we don't forget what we planted where! Do you have any ideas about what we could use for labels? So far, everything we've tried hasn't been strong enough and we always lose them. Any ideas would be appreciated :)

Once the plants were in the ground, they decided they wanted to build the greenhouse we purchased with the donated money. We bought a mobile greenhouse that has 4 shelves and a plastic cover, mainly for seedlings and smaller plants that you can roll around. The kids built it in record time. Have you ever used a greenhouse like this?

Most importantly, a group worked on planting some veggies in pots so everyone could take one home. This way, they can have a garden at home too! Did the plant make it home safely? Where did you put it? What did your child tell you about it? What vegetable did you get?

We really hope it does well, and would love to see its progress as it continues to grow. Please keep us updated and let us know what you think!

Hello families! Greetings from Broccoli, Collards, and Squash, oh my!

Our cluster is coming to an end ☹ To prepare for our last day together, we began talking about everything we had done and *still* wanted to do. So far, this is our list:

Build a greenhouse Worms! Get compost for the garden

Plant seedlings and transfer them to the garden

Scarecrow – we still need to make some decisions about this element of our garden

After listing, they decided they still had work to do. One thing they decided to work on was telling their family and friends about their garden.

Because we were so busy last week with planting and building our greenhouse, we still had compost that needed to be shoveled into our beds. A small group went outside with me to shovel and they worked so quickly to make sure our beds were completely filled. They also worked together to make sure that as it was shoveled into the bed, it was also smoothed out so it was even.

The group inside worked on a way to tell everyone about the garden. At first, we were going to vote on the best picture for a flier. But, as they were voting, they decided that *all* of their pictures were too wonderful to pick! As a class, we decided to incorporate everyone's work into one flier. We hope we see you at the cluster fair so you can see their work :)

How are you plants doing? Are they growing? Have you added anything to them? During this cluster, we won't have enough time to see our radishes, broccoli, and other vegetables grow very much, so I hope that they can harvest vegetables from the plants they took home.

Hello families! Greetings from Broccoli, Collards, and Squash, oh my!

Our cluster is over : (But, we had so much fun together and the kids really did learn a lot and have fun. We also learned a lot from them and from you, so thank you!

They worked really hard to prepare for the cluster fair, so we hope they shared that with you. As a class, they decided to plant some of our seedlings in the garden. The rest of the seedlings were given to families at the cluster fair. They decided that sharing their plants with others was a great way to share their message of "good food for everyone!"

To share what they did, they worked on a poster to display. They wrote and illustrated how they planted seeds, built a worm bin, installed rain barrels, and built a greenhouse. Did they share anything with you? If you were able to come to the cluster fair, what did you think of their work?

Do you have any tips for us that we can use in future clusters? They decided that future students should talk to the cafeteria staff so that we can eat the food we grow. What do you think about this?

Please let us know what you thought of our cluster, we would love to hear from you!

If you were not able to attend, we have attached the flyer that they worked on; hope you enjoy it ☺

Appendix N: Cluster Flier