

School Garden Outcomes on Urban Youth

By

Ashley DeAnn Collins

(Under the Direction of Dr. Dennis Duncan)

Abstract

The purpose of this study was to determine what aspect of school garden programs has the greatest positive outcome on urban middle school youth. This includes cultivation (caring for plants), culinary components (cooking produce from the garden), and/or social (working with others) aspects in which urban middle school youth participants have been involved within their school garden program. A quantitative questionnaire was used to measure the outcomes on students ($n = 39$) who work in the school garden, and a focus group of participating students ($n = 4$) was conducted to acquire additional, in depth information. The constructs within the study were cultivation, culinary components, and social. Data analysis indicated that the cultivation construct had the greatest positive outcome on urban middle school youth. A surprising find within the study was the insistence of focus group participants that school gardens should be incorporated into all schools. Recommendations for future research were to focus on the social development of students in middle school in regards to school garden programs and to determine if home gardens have a similar outcome that school gardens have on students in regards to these constructs. This study revealed that school garden programs should incorporate cultivation aspects into their school garden programs to have the greatest positive outcome on their students.

School Garden Outcomes on Urban Youth

by

Ashley DeAnn Collins

BSA, University of Georgia, 2013

A Thesis Submitted to the Graduate Faculty of the University of Georgia in Partial Fulfillment of
the Requirements for the Degree

MASTER OF AGRICULTURAL LEADERSHIP

ATHENS, GEORGIA

2015

© 2015

Ashley DeAnn Collins

All Rights Reserved

School Garden Outcomes on Urban Youth

by

Ashley DeAnn Collins

Major Professor: Dennis Duncan

Committee: Nick Fuhrman
David Knaft
David Berle

Electronic Version Approved:

Julie Coffield
Interim Dean of the Graduate School
University of Georgia
May 2015

Dedication

This study was dedicated to my friends, family, and advisors who helped make it possible.

To my mother, Dr. Debbie Collins, who has been the inspiration and driving point in my pursuit of education my entire life and read this thesis more than anyone else.

To my father, Bert Collins, who pushed me to be the best I can be.

To my fiancé, Sam Lemley, who at the end told me he would only marry me if I finished this thesis.

To my friend, Gretchen Perkins, who provided guidance, support, and a shoulder to cry on through my entire graduate program.

To Dr. Dennis Duncan, who has advised me for the past six years and guided my undergraduate and graduate career with a supportive and encouraging hand.

Acknowledgements

I would like to thank Laura Ingwers, whose master's thesis titled "Community Garden Impact Study in Athens, Georgia" provided a detailed outline and framework for the completion of this study.

I would also like to thank my thesis committee for the support throughout this process.

Dr. David Knauff, thank you for your continued academic and financial support throughout my graduate program. You provided me with the best assistantship through Project FOCUS I could have ever asked for!

David Berle, thank you for introducing me to the world of UGarden and encouraging me to be involved. It has provided me with hands-on experience and deepened my passion for community and school gardens.

Dr. Nick Fuhrman, thank you for being a supportive and encouraging instructor through so many courses and the thesis writing experience. You are owl-standing!

Table of Contents

	Page
Acknowledgments.....	v
List of Tables.....	ix
List of Figures.....	x
Chapters	
1 <u>Introduction</u>	1
Purpose and Objectives.....	1
Question.....	1
Background and History.....	2
Theoretical Framework.....	3
Definition of Terms.....	4
Study Limitations.....	6
2 <u>Review of Literature</u>	7
History of School Gardens and School Garden Programs.....	7
Benefits of School Gardens and School Garden Programs.....	10
Cultivation Aspect of School Garden Programs.....	11
Culinary Aspect of School Garden Programs.....	12
Social Aspect of School Garden Programs.....	13
Middle School Agricultural Education Programs.....	14
AmeriCorps VISTA.....	16

Case Study School.....	17
Researching Middle School Students through Active Parent Consent.....	18
Theoretical Framework.....	19
3 <u>Research Design and Methods</u>	23
Purpose and Objectives.....	23
Justification of Mixed Methods Approach.....	23
Quantitative Data Collection Procedures.....	24
Qualitative Data Collection Procedures.....	30
Data Analysis.....	32
4 <u>Results</u>	34
Purpose and Objectives.....	34
Research Objective #1.....	35
Research Objective #2.....	37
Research Objective #3.....	39
Research Objective #4.....	41
Research Objective #5.....	43
5 <u>Discussions and Recommendations</u>	46
Purpose and Objectives.....	46
Review of Methods.....	46
Discussion of Population.....	48
Summary of Combined Quantitative and Qualitative Findings.....	48
Recommendations for Future Research.....	52
Relevance Statement.....	54

References.....	55
Appendices	
<u>A – Consent Form Cover Letter.....</u>	60
<u>B – Parent Consent Form.....</u>	62
<u>C – Child Assent Form.....</u>	66
<u>D – Questionnaire Instrument – Pilot Version.....</u>	68
<u>E – Questionnaire Instrument – Final Version.....</u>	70
<u>F – Focus Group Guiding Questions.....</u>	72
<u>G – Focus Group Transcription.....</u>	73
<u>H – Transcript Codes.....</u>	80
<u>I – School District Research Proposal.....</u>	83
<u>J – Principal Commitment.....</u>	91
<u>K – School District and IRB Research Approval.....</u>	92

List of Tables

	Page
Table 1 - Construct Three Cronbach's Alpha if Items Were Deleted.....	27
Table 2 - Pilot Study Questionnaire Constructs and Corresponding Reliabilities.....	28
Table 3 - Participant Responses to Demographic Items Reported in Valid Percentages.....	36
Table 4 - Construct One – Cultivation – Responses Reported as Valid Percentages and Means.....	38
Table 5 - Construct Two – Culinary – Responses Reported as Valid Percentages and Means....	40
Table 6 - Construct Three – Social – Responses Reported as Valid Percentages and Means.....	42
Table 7 - Domain Analysis – Common Themes from Each Construct Identified in Focus Group	45
Table 8 - Race/Ethnicity Demographic Comparison between Sample Population and School Population.....	48

List of Figures

	Page
Figure 1: Kolb’s Theory of Experiential Learning	9
Figure 2: Three-Ring Model of Agricultural Education	15
Figure 3: Social Cognitive Theory	20

Chapter One - Introduction

Purpose and Objectives

The purpose of this study was to determine what aspect of school garden programs had the greatest positive outcome on urban middle school youth. Aspects included cultivation, culinary, and/or social components in which urban middle school youth participants had been involved within their school garden program. A quantitative questionnaire was used to measure the outcome on students who work in the school garden and a focus group of participating students was conducted to acquire additional information. The objectives of this study were (1) to determine demographics of the study participants; (2) to determine if garden cultivation (propagating, planting, caring for, and harvesting) had a positive outcome on urban middle school youth; (3) to determine if culinary components (food preparation and consumption of school garden produce) had a positive outcome on urban middle school youth; (4) to determine if socialization with family and peers in the garden had a positive outcome on urban middle school youth; and (5) to gather personal perspectives from active students through a focus group in the qualitative aspect of study.

Question

The question that was answered within this study was: *Which aspect of school garden programs had the greatest positive outcome on urban middle school youth?*

Background and History

School gardens are defined as a designated space at a school where plants (landscape and edible) are grown for the benefit of the students' surroundings, learning, and/or consumption. This may range from potted plants and raised beds, to composting programs, in-ground plots, habitat and butterfly gardens, greenhouses, and ponds (Blair, 2009). School gardens have been an active part of United States schools since 1890, when the first school garden was established in Roxbury, Massachusetts. In the 1900s, school gardens expanded to inclusion within inner city schools as well. During World Wars I and II, they were used to grow food for the community and were considered an act of patriotism ("History of Youth Gardens," 2002).

Since the early 1990s, school gardens have continued to rise in popularity and have been incorporated and encouraged into the curriculum for state departments of education in states such as California, Oregon, Pennsylvania, New York, and Texas. Garden curriculums primarily target elementary level students because they are simple to coordinate into their standards and science curriculum (Blair, 2009). However, school garden curriculum can be incorporated in middle and high schools through agricultural education courses and core courses, such as science, math, and language arts. School gardens have continued to grow in popularity due to the farm to school movement, which is an effort to connect school cafeterias with producers of healthy, local food and educate students on nutrition and agriculture in classrooms and gardens ("Farm to school," 2015).

School garden programs have demonstrated many benefits towards students, schools, and their communities. Students who have participated in school garden programs have demonstrated increased standardized test scores and interest in nutrition education (Hicks, 2015; Emekauwa, 2004; Lieberman, & Hoody, 1998). Parents of students who are in school garden programs are

more likely to volunteer at their children's schools because they feel more comfortable approaching and interacting with the schools (Boyer, McFarland, Zajicek, & Waliczek, 2011). The history and different benefits are discussed in greater detail within Chapter Two.

Theoretical Framework

There are two theories that provided the framework for this research study – Social Cognitive Theory and the theory of Significant Life Experience. Social Cognitive Theory explained how learners gain knowledge by observing others within their environment and posited that learning is a social act, not an individual action. Theorized by Bandura in the 1960's, Social Cognitive Theory has been used heavily in classrooms due to its observation aspect through demonstrations and modeling (Schunk, 2012). The theory of Significant Life Experience explained an impactful experience someone has had that altered his/her life choices, such as participating in a school garden program. It has been widely accepted in the area of environmental education as a theory to support how educating children to protect the environment has encouraged environmentally-friendly behaviors later in life (Chawla, 2006). These theories were chosen for this study because they apply to middle school youth. Between the ages of 11-13, there are many developmental changes occurring as students begin to transition to the capability of abstract thought. Middle school students are curious and want to learn skills that address real life problems, as well as prefer to participate in active learning experiences ("Characteristics of Middle Grade Students," 2015). The significance of these theories was explained in more detail within Chapter Two.

Definition of Terms

- Agricultural Education Programs – A middle or high school education program that teaches students about agriculture, food and natural resources. It includes three components: classroom or laboratory instruction, experiential learning, and leadership education (“Agricultural Education,” 2015).
- AmeriCorps – “A program of the Corporation for National and Community Service (CNCS), an independent federal agency whose mission is to improve lives, strengthen communities, and foster civic engagement through service and volunteering. AmeriCorps is made up of three main programs: AmeriCorps State and National, AmeriCorps VISTA (Volunteers in Service to America), and AmeriCorps NCCC (National Civilian Community Corps)” (“AmeriCorps VISTA,” 2015).
- Aspect – “A part of something; a particular status or phase in which something appears” (“Aspect”, 2015).
- Compost – “A mixture of various decaying organic substances, such as dead leaves, used for fertilizing soil; to make compost; to use in compost” (“Compost,” 2015).
- Culinary – “Of, relating to, or used in cooking or in the kitchen” (“Culinary,” 2015).
- Cultivation – “The act or art of cultivating, meaning to prepare and work on land in order to raise and maintain crops” (“Cultivate,” 2015).
- Experiential Learning – A learning theory created by Dr. David Kolb. He defined it as “the process whereby knowledge is created through the transformation of experience. Knowledge results from the combinations of grasping and transforming experience.” Examples of experiential learning include hands-on activities, internships, and job shadowing (Cherry, 2015).

- Farm to School – An effort to connect school cafeterias with producers of healthy, local food and educate students on nutrition and agriculture in classrooms and gardens. “Farm to school implementation differs by location but always includes one or more of the following:
 - Procurement: Local foods are purchased, promoted and served in the cafeteria or as a snack or taste-test;
 - Education: Students participate in educational activities related to agriculture, food, health or nutrition; and
 - School gardens: Students engage in hands-on learning through gardening” (“Farm to school,” 2015).
- Outcome – “Something that follows as a result or consequence of an activity or process” (“Outcome”, 2015)
- School Garden – A designated space at a school where plants (landscape and edible) are grown for the benefit of the students’ surroundings, learning, and/or consumption. This may range from potted plants, raised beds, composting, in-ground plantings, habitat and butterfly gardens, greenhouses, and ponds (Blair, 2009). Within this study, the school garden utilized by participants is a four plot rotational (in ground planting) field, a fruit orchard, raised beds, a vertical herb wall, a cafeteria composting facility, a greenhouse, and a small chicken coop. This program has an emphasis in fruit and vegetable production.
- School Garden Programs – The combination of “classroom instruction with garden-related activities in which students plant, nurture, harvest, and often consume produce grown in the schoolyard” (Ratcliffe, Merrigan, Rogers, & Goldberg, 2009).

- Social – “Pertaining to, devoted to, or characterized by friendly companionship or relations; seeking or enjoying the companionship of others” (“Social,” 2015).
- The National FFA Organization – An intercurricular student organization for middle school through college aged students interested in agriculture and leadership. It is one of three components of an agricultural education program (“FFA,” 2015).
- Urban Youth – Children who reside in an urban area/city with limited access to rural communities are what this study is referring to as ‘urban youth’.

Study Limitations

This study was conducted solely at an urban public middle school in Athens, Georgia, and therefore the results cannot be generalized to school gardens nationwide. While the sample size of 39 was strong enough to do a statistical analysis on the data, a larger sample size would have provided more support for generalization to other school garden programs. Because the study surveyed middle school youth with active parent consent forms (see Appendix B), child assent forms (see Appendix C), and a questionnaire (see Appendix E), which were given to participants individually as required by the University of Georgia Institutional Review Board, there was a low response rate. The researcher, in partnership with school faculty, depended on members of the school faculty to distribute forms to participants, which resulted in a lower response rate.

Chapter Two – Review of Literature

History of School Gardens and School Garden Programs

School gardens have been an active part of European education since 1811 due to the belief that nature is an important aspect of a child's education. In 1869, it was mandated in Austria that every school have a garden for its students to utilize. England, France, Germany, Russia, and Belgium enacted similar requirements at that time. School gardens in Europe are still utilized because they are an applicable way to teach life sciences and important life skills (Hayden-Smith, 2011).

School gardens have been an active part of United States' schools since 1890, when the first school garden was established in Roxbury, Massachusetts at the George Putnam School. The number of school gardens increased in popularity in the 1900s, when they were incorporated into larger cities' schools, such as Washington, D.C. ("History of Youth Gardens," 2002). This expansion was due to the many ways school gardens could be utilized to teach natural sciences, vocational skills, and agricultural practices. By 1906, it was estimated that there were over 75,000 gardens across the United States (Hayden-Smith, 2011). During World War I, the Federal Bureau of Education created the United States School Garden Army to promote citizens growing their own food (Hayden-Smith, 2011), and during World War II school gardens were used to grow food for the community and were considered an act of patriotism through the Victory Garden program ("History of Youth Gardens," 2002). However, after World War II they fell out of normal practice until the 1970s, when they became a push within the environmental

movement. They remained popular for a few years, and then once again school gardens diminished in frequency until the beginning of the farm to school movement in the early 1990s (Hayden-Smith, 2011). Since then school garden programs have been incorporated into curriculum for state departments of education in many states, such as California, Oregon, Pennsylvania, New York, and Texas. Garden curriculums primarily target elementary level students based on their easy application to life science curriculum (Blair, 2009). However, they can be incorporated in middle and high schools through their agricultural education courses and core classes such as sciences, math, and language arts. School gardens are an excellent example of experiential learning, a theory created by Dr. David Kolb. He defined it as “the process whereby knowledge is created through the transformation of experience. Knowledge results from the combinations of grasping and transforming experience” (Cherry, 2015). Kolb’s theory is represented in a four stage cycle – concrete experience, reflective observation, abstract conceptualism, and active experimentation (Figure 1). Effective learning occurs once someone has experienced all stages of the cycle and can move on to new experiences and begin the process again (McLeod, 2013).

Experiential learning is applicable to middle school education as students are at an age where curiosity and hands-on activities greatly appeal to them. School garden curriculum offers many opportunities that would allow students to walk through each step of experiential learning. For example, a seed germination experiment is a hands-on project focused on experiential learning. A *concrete experience* is provided to the students by actively planting their seeds. They move on to *reflective observation* by reflecting on how they planted and cared for their seeds. *Abstract conceptualization* allows students to hypothesize what will happen with their seeds if they overwater or underwater them. *Active experimentation* allows students to physically interact

with their seeds and overwater or underwater them, and then reflect on what occurred. Then the experiential learning process begins again and students have now gained something from the experience.



Figure 1: Kolb's Theory of Experiential Learning

The farm to school movement is one reason for an increase in school garden programs since the 1990s. The farm to school movement focuses on three aspects that are individually or collectively incorporated into a school – procurement of local produce for the consumption of students in the cafeteria or in snack form; educational activities that promote agriculture, food, and nutrition; and engagement of students in a school garden program. The movement has expanded from just a few schools to over 40,000 schools in all fifty states. According to a 2011-2012 USDA Farm to School Census, 44% of the schools in the United States have participated in farm to school activities with over 35 million students involved (“Farm to school,” 2015). In a study conducted by the Georgia Organics Farm to School Initiative in 2011, 89% of parents whose children had participated in Farm to School activities observed at least one positive difference in their children's fruit and vegetable preferences and consumption (Ballentine, 2011).

Benefits of School Gardens and School Garden Programs

School gardens have continued to grow in popularity due to the farm to school movement and have brought many benefits to students, schools, and their communities, such as increased academic achievement, higher parental involvement in schools, and benefits on community volunteers. Much research has been done to determine the impact of school garden programs on student leadership development and fruit and vegetable consumption as well.

School garden programs have been utilized by many schools to improve the academic curriculum taught in classrooms. School gardens provide hands-on experiential learning in this area of study for students of all ages. A study conducted among 4,194 California school principals (a 43% response rate) analyzed the different reasons schools implemented school garden programs. Fifty-seven percent of respondents indicated that they had school garden programs at their schools, and 87% indicated that they had school garden programs for academic instruction in the following subjects – science, environmental studies, nutrition, language arts, math, and agricultural studies (Graham, Deborah, Lussier, McLaughlin, & Zidenberg-Cherr, 2005). Emekauwa (2004) conducted a study in a rural Louisiana school district that revealed three years of the school district's involvement in a place-based learning ecology program greatly reduced the number of unsatisfactory standardized test scores for language arts, mathematics, science, and social studies among fourth graders.

A study conducted in Texas revealed that parents of students involved in school garden programs were more likely to volunteer at their children's schools. Boyer et al. (2011) conducted a retrospective pre-test and post-test survey with parents of third through fifth graders who were involved in voluntary garden programs at their schools. Their results indicated that parents had increased positive attitudes toward their children's schools after their involvement with school

garden programs and they felt more comfortable coming to the schools with concerns or in volunteering capacities (Boyer et al., 2011).

Townsend et al. (2014) conducted a study that focused on the motivations and impacts of community volunteers within school garden programs. Their study revealed that volunteers were motivated to participate in the program because they were concerned about children's diets, supported the school and the school garden purpose, and wanted to share their skills with the younger generations. Benefits on volunteers include the feeling of being valued and needed by the program, as well as belonging to something greater than themselves. It also increased their confidence with relation to gardens and food, making them more confident to cook with what the garden provided. Their involvement benefited the school garden program by sharing their skills and knowledge, as well as creating better relationships with the school and its surrounding community. The school garden program was heavily dependent on volunteer support and was only able to function due to volunteer efforts.

While there were many articles found by the researcher that discussed different benefits of school garden programs, there were no articles that discussed what positive outcomes existed from students who had participated in different aspects of school garden programs. For the purpose of this study an emphasis was made on benefits of cultivation, culinary, and social aspects of school garden programs.

Cultivation Aspect of School Garden Programs

While the cultivation and caring for a garden is arguably the most common aspect of a school garden program, little research has been conducted to study the benefits students reap by caring for the garden themselves. A kindergarten teacher in the Bronx, New York, developed a

school garden program to expose his urban students to nature and “get their hands dirty”, and encourage them to “appreciate, respect, and nurture” nature through hands-on science activities (Gopal & Pastor, 2013). The program was so successful with kindergarten students that it was implemented in other grades the following year. Cultivation also offers an additional physical education time for students as they carry water cans, push wheelbarrows, and dig holes. The cultivation of a garden is the stepping stone for many other benefits, such as the willingness to try new vegetables and apply science concepts to real-world experiences (Graham et al., 2005; Ballentine, 2011; Ratcliffe et al., 2009).

Culinary Aspect of School Garden Programs

Culinary and nutrition education are other important aspects of a successful school garden program. Quick et al. (2010) conducted a study to determine if it is possible to create school-based nutrition curriculum with the incorporation of school-garden activities. After conducting interviews and surveys with parents, students, and teachers involved in their school garden and implementing nutrition curriculum, as well as studying a control group, they concluded that school-based garden programs are a suitable step towards nutrition curriculum. They also determined that “The school garden as an experiential learning approach was highly valued by students, teachers, and parents alike” (p. 128). Graham et al. (2004) reported that 39% of the California principals reported that their school gardens were utilized to provide fruits and vegetables for students, and 77% of the plants grown in school gardens were vegetables.

Research has also shown that school garden programs may impact a children’s consumption of vegetables and their willingness to try new things, which can be related back to the theory of Significant Life Experience. Ratcliffe et al. (2009) conducted a study where 236

students completed a quantitative survey on vegetable consumption and 161 participated in a vegetable taste test. The study targeted low-income, urban middle school-aged students and their abilities to identify different produce, as well as their willingness to try new vegetables and overall regular vegetable consumption. Two sets of students were actively involved in school garden programs, while another set, the control group, was not. This study discovered that students who were involved in school garden programs could correctly identify more vegetables than those in the control group and that they had a higher preference to consume vegetables, especially those that were grown in their school garden. Similarly, a study in Australia that compared the impact of nutrition education with and without school gardens revealed that students who participated in nutrition education programs that incorporated school gardens had a higher overall willingness to try vegetables, stronger ability to identify vegetables, and higher preference to eat broccoli as a snack when compared to students who participated in nutrition education programs without school gardens (Morgan et al., 2009). It can be hypothesized, based on the literature, that there is a direct link between a child's commitment to eating vegetables and their commitment to growing their own food.

Social Aspect of School Garden Programs

The middle school years are a critical period for the development of social skills such as teamwork, leadership, and cooperation. School gardens are more inclusive than other extracurricular aspects of school and promote social inclusion for those that usually feel isolated based on ability, race, class, or gender (Dyment & Bell, 2008). A study conducted in Australia focused on a multicultural school garden program that was utilized by the English as a Second Language program. Students in the program were instructed to redesign an abandoned garden

space into a functioning garden. The researchers observed that students from many different countries and backgrounds were able to share their cultures with the other students and that the program offered a “sense of belonging for students newly arrived to the country” through the garden development project (Cutter-Mackenzie, 2009, p. 129).

A study conducted by Tufts University that focused on teachers and students who were involved in urban school garden programs revealed participating in the garden provided the students opportunities to “participate meaningfully in the community” (p.114). Such programs also allowed students to work with different students and adults collaboratively on projects and develop meaningful relationships that may not have occurred outside of the garden. Students indicated that they utilized patience and responsibility within the garden and that it helped them utilize those skills in other aspects of their lives (Ratcliffe, 2007). Robinson and Zajicek (2005) studied the effects of a yearlong school garden program on the development of life skills among third, fourth, and fifth graders in north Texas. After comparing pre-test and post-test data of students who were and were not involved in the school garden program, researchers concluded that students who were involved in the school garden program increased their overall life skills of teamwork, self-understanding, leadership, decision making skills, communication skills, and volunteerism more so than non-participants. As Robinson and Zajicek (2005) suggested, “School garden programs offer youth opportunities to improve the skills necessary to succeed in all aspects of life” (p. 456).

Middle School Agricultural Education Programs

There are over eighty middle school agricultural education programs in the state of Georgia (2014-15 Georgia FFA Chapters, 2015). Middle school programs were developed based

on a recommendation by the National Research Council in 1988 to the Committee on Agricultural Education in Secondary Schools to instruct all students about agriculture (Boone, 2011). In 1992, a study conducted nationally revealed that thirty states had middle school agricultural education programs with over 52,000 students enrolled (Rossetti & McCaslin, 1992). According to Gibbs (2005), "...educators across the nation realize that developing students' interests must be addressed earlier – at the middle school level. Agriculture educators... are working to grow middle school agriculture education." Middle school agriculture programs follow the same structure as high school programs (classroom or laboratory instruction, experiential learning, and leadership education) and cover a wide variety of agriculture-related topics, as well as requiring students to complete a Supervised Agricultural Experience (SAE) project and have FFA chapters (Figure 2) (*2014-15 Georgia FFA Chapters*, 2015).



Figure 2: Three-Ring Model of Agricultural Education

Members of middle school programs are from grades six through eight and programs vary in length from six weeks to thirty-six weeks (Rossetti & McCaslin, 1992). Middle school FFA members may participate in many of the same Career Development Events (CDE) as high school students and attend camps and conventions (*2014-15 Georgia FFA Chapters*, 2015). Middle school programs expose students to agriculture at a much younger and more

impressionable age than high school programs and are also a great recruitment tool for the related high school program (Boone, 2011).

Middle school students are at a curious age and want to learn skills that address real life problems. They also prefer to participate in active learning experiences (“Characteristics of Middle Grade Students,” 2015). Because middle school agriculture, and school gardens specifically, are predominantly hands-on and interactive topics, they are very applicable to middle school development. However, a majority of the literature and curriculum development found focused on school garden programs for elementary school students, which revealed another need for this study.

AmeriCorps VISTA

AmeriCorps VISTA is a program sponsored by the Corporation for National and Community Service, which is an independent federal agency whose mission is to improve lives, strengthen communities, and foster civic engagement through service and volunteering.

AmeriCorps is made up of three main programs: AmeriCorps State and National, AmeriCorps VISTA (Volunteers in Service to America), and AmeriCorps NCCC (National Civilian Community Corps) (“AmeriCorps VISTA,” 2015). The service term for an AmeriCorps VISTA volunteer is one year, and they are paid \$800 - \$1,100 with the benefit of an education stipend at the completion of their service (Fontinelle, 2015). The case study school hosts an AmeriCorps VISTA volunteer who works with the school and the local university garden to manage the middle school’s garden program. He works with the agricultural science instructor and the family and consumer sciences instructor at the case study school to encourage gardening, composting, and healthy eating habits. He has expanded the cafeteria composting program, installed a garden

bar in the cafeteria, and created a summer garden program where students care for the garden and create meals for the community with their garden produce through workshops led by local chefs. The agriscience connections course has added a chicken coop in a courtyard of the school and a goat pen since his assignment to the school. He has impacted the school by being a full-time volunteer who has time to devote to the garden and other projects, such as the composting program, the garden bar, and the summer garden program.

Case Study School

The case study school was selected based on its extensive school garden program, proximity to the researcher, and the faculty's willingness to participate in the study. Fifty-three teachers worked at the school, and 680 students were enrolled in 2014. Forty-eight percent of students were identified as African-American, 3% Asian, 12% Hispanic, 5% multi-racial, and 32% white (*Annual Performance Report*, 2014). Sixty-six percent of students enrolled qualified for free or reduced meals at school, meaning that they live at or below the poverty line (*Clarke Middle School Information*, 2011).

Their school garden program is a component of their agriscience connections course, which had 232 students enrolled at the time of the study. Students were enrolled in the course for a 16-week semester and attended the class every other day. While in middle school, they had the option of taking agriscience for three semesters, one semester each grade level year. The school garden program consisted of a four plot rotational (in ground planting) field, a fruit orchard, raised beds, a vertical herb wall, a cafeteria composting facility, a greenhouse, and a small chicken coop. The emphasis was on fruit and vegetable production. Students enrolled in the agriscience courses spent time in the greenhouse and garden, as well as cooked produce in the

classroom. An AmeriCorps VISTA volunteer was present at the school full time and worked with the agriscience course to expand the garden program through projects such as a summer garden program, the garden bar, and a composting program.

Researching Middle School Students through Active Parent Consent

When surveying and interviewing children, parental and participant consent must be obtained. For this study, an introductory letter was sent home with each student along with the active parent consent form in an attempt to increase response rate (Appendix A and B). However, as seen in a study completed by Woodruff, Mayer, and Clapp (2006), introductory letters appeared to have little or no significant effect on the response rate from parents allowing their children to participate in the study. An overarching concern with the utilization of active consent is a low response rate. Active consent requires parents to sign and return a form indicating that their children have permission to participate in a research effort, whether it be a survey, interview, etc. This results in consent only being given when parents actively give their children permission to participate in writing (phone calls and conversations are not active consent). Unreturned parental consent forms result in the children's inability to participate in a study, and there are many reasons surveys may not be returned – parents did not want their children to participate in the survey; parents did not receive the form from their children; parents or children forgot to return the form; or the form was lost in transit. A study conducted to compare the response rates of passive parent consent and active parent consent in fourteen Kentucky school districts revealed that passive parent consent has a response rate of 79%, while active parent consent had a response rate of just 29%, including the use of incentives at the student level (Courser, Shamblen, Lavrakas, Collins, & Ditterline, 2009).

Another study focusing on active parent consent wanted to determine the difference in survey distribution methods. A total of 695 consent forms were directly given to parents of sixth grade students at a parent informational meeting held at the school with the study being explained to the parents, while 877 consent forms were given to sixth grade students in class. The students were instructed to take the consent forms home to their parents and the study was explained to them. An incentive was offered to the student group if 90% of each class returned the form, and a reminder was given to students once a week for the next four weeks. An overall response rate of 69% was obtained for all surveys that were distributed. A total of 89.8% of the consent forms that were directly given to parents were returned, while 53.2% of the consent forms that were directly given to students were returned. Parents who attended the parent meeting were more likely to give their children permission (69.6%) than parents who were given the form by their children (27.9%) (Stein et al., 2007). While child-distributed consent forms consistently result in a low response rate, due to time constraints of the study and the case study school, it was the most applicable way to distribute consent forms for this study.

Theoretical Framework

There are two theories that provided the framework for this study - Social Cognitive Theory and the theory of Significant Life Experience.

Theorized by Bandura in the 1960's, Social Cognitive Theory has been used heavily in classrooms due to its observation aspect through demonstrations and modeling (Schunk, 2012). Social Cognitive Theory explained how learners gain knowledge by observing others within their environments and that learning is more of a social act, rather than an individual decision. The assumptions of social cognitive theory are: behavior is purposeful and driven by a goal;

individuals are self-reflective; learners are able to self-regulate; and reciprocal determinism takes place (Bandura, 1986, 1997). The three factors that allow one to evaluate behavior change within social cognitive theory (reciprocal determinism) are environment, personal factors, and behavior. Environment refers to the factors that impact a person's behavior and include the physical environment (their physical surroundings) as well as social environment (the people or social situation they are in); personal factors are an individual's self-efficacy towards a behavior, and behavior is the response that the learner receives once they have completed the desired behavior. The three factors are all mutually important and build off of each other equally for learning to take place (Figure 3) ("Social Cognitive Theory," 2010).

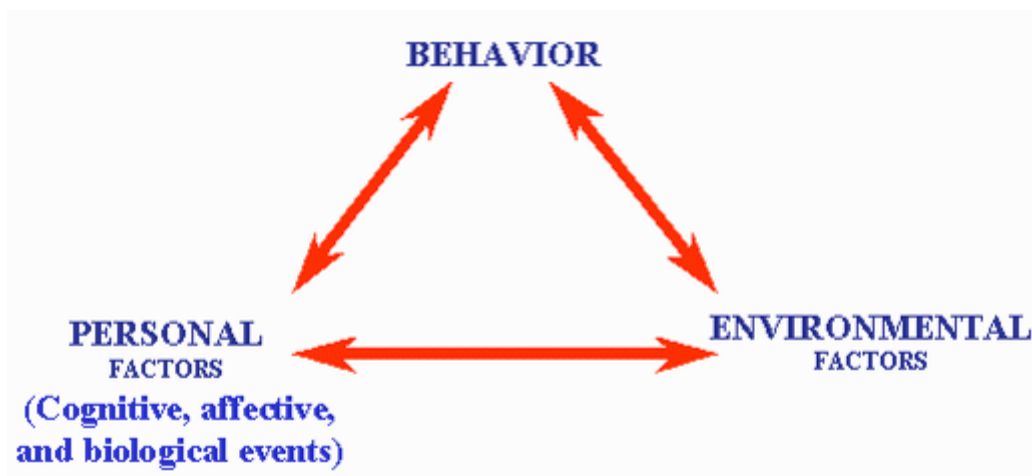


Figure 3: Social Cognitive Theory

Bandura's work has been utilized in classrooms, such as agriculture courses and sciences, due to its incorporation of observational learning and modeling and encouragement of hands-on activities. Observational learning occurs when a learner watches the actions and outcomes of others. This allows them to determine how to complete a task or reach a goal within a similar situation ("Social Cognitive Theory," 2010). Modeling occurs when a teacher (the model) demonstrates a behavior that a student is attempting to learn. The model will demonstrate the behavior within an environment and the learner will then imitate the behavior. The model will

then respond to the behavior enacted by the student with positive or negative reinforcement, depending on if it was a desirable behavior (McLeod, 2011).

The theory of Significant Life Experience describes the importance of an impactful experience someone has had that altered his/her life choices, such as participating in a school garden program. It has been widely accepted in the area of environmental education as a theory to support how educating children on ways to protect the environment can alter their environmentally-friendly behaviors later in life (Chawla, 2006). Chawla's research on Significant Life Experience focuses on why experts within the world of environmental advocacy and education chose to pursue such a career. Chawla primarily utilized qualitative research practices (interviews and focus groups) to determine which "significant life experience... people themselves believe to have shaped their environmental attitudes and actions" (Chawla, 2006, p. 360). According to Monroe (2003), two common themes that appeared in multiple studies by Chawla to have influenced the career choices of people within environmental positions were "childhood experiences of natural areas" and "school-based education, particularly opportunities to take action" (p. 121). Both of these themes directly applied to school garden programs as they were aspects of school-based education that occurred in natural areas and encouraged students to take actions, environmentally and nutritionally.

These two theories were chosen for this study because they apply to middle school youth. At middle school age, there are many developmental changes occurring within students as they begin to transition to the capability of abstract thought. Middle school students are curious and desire to learn skills that address real life problems, as well as preferring to participate in active learning experiences ("Characteristics of Middle Grade Students," 2015). Both theories describe

how learners to observe others around them and learn behaviors that will ultimately influence their decisions later in life.

Chapter Three – Research Design and Methods

Purpose and Objectives

The purpose of this study was to determine what aspect of school garden programs had the greatest positive outcome on urban middle school youth. Aspects included cultivation, culinary, and/or social components in which urban middle school youth participants had been involved within their school garden program. The objectives of this study were:

1. Determine demographics of the study;
2. To determine if garden cultivation (propagating, planting, caring for, and harvesting) had a positive outcome on urban middle school youth;
3. To determine if culinary components (food preparation and consumption of school garden produce) had a positive outcome on urban middle school youth;
4. To determine if socialization with family and peers in the garden had a positive outcome on urban middle school youth; and
5. Gather personal perspectives from active students through a focus group in the qualitative aspect of study.

Justification of Mixed Methods Approach

This study took a mixed methods approach to ensure the collection of measurable quantitative data and to gather additional, in depth qualitative data from participants through the use of a focus group. A survey instrument was created as the quantitative method to collect data

from a sample of a large population of 232 and a focus group was selected as the qualitative data collection method to collect more in-depth responses to the overall questions of the study. This methodology combined techniques to gain a more complete picture of the positive outcomes that school garden programs have on urban middle school. Mixed methods research has risen in popularity because it is a form of assessment that can ensure entirety and precision of the data collected, as well as validity of the instruments and questions utilized during a study (Bloor, Frankland, Thomas & Robson, 2001; Hittleman & Simon, 2002).

Much of the literature about school garden programs utilized either qualitative or quantitative data, and few took a mixed methods approach. While qualitative and quantitative data collections are both useful means of data collection, the researcher felt that a mixed methods approach for this study would present a more complete picture on which aspect of school garden programs has the greatest positive outcome on urban middle school youth.

Quantitative Data Collection Procedures

Prior to Data Collection

The researcher began volunteering at the Clarke Middle School garden program in August 2013, a year before data collection. The researcher worked an average of ten hours a week in the Clarke Middle School garden planting and managing crops, working with students, and leading volunteer groups of university students. These activities allowed the researcher to create bonds with the key informants (teachers, students, and the AmeriCorps VISTA volunteer) and gain firsthand knowledge of how the school garden program was managed and operated. It also allowed the researcher to gain insight into how the students participated in the garden, which helped design the research instrument that was applicable to the students' experiences in the

garden. Volunteering in the garden established trust and connections with the students, which was an important aspect in gaining a high response rate among participants (Dillman, 2009).

Instrument Development

After a review of the literature, it was determined that there were no quantitative instruments that discussed the detailed aspects of school garden programs (cultivation, culinary, and social) that could be utilized by the researcher, so an instrument was developed. The researcher followed suggestions on instrument development from Dillman (1993, 2009). The questionnaire was concise and only one page, front and back, so that it appeared short and not overly time-consuming for participants. A Likert scale was utilized as a response method to statements within each construct (cultivation, culinary, and social), with answer options of Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4), and Strongly Agree (5). Demographic items were included on the questionnaire to determine race/ethnicity, age, grade level, and gender of participants, as well as to determine how many semesters each student had been enrolled in the agricultural connections course and if he or she were involved in the agricultural-related extracurricular activities provided at the school.

The pilot questionnaire (Appendix D) was utilized for the pilot study, which was conducted to determine the reliability and validity of each construct and item within the instrument. The instrument was reviewed to ensure validity by a committee of professors as well as the instructor of the agriscience connections course at the case study school. The items were evaluated for language that might confuse participants, formatting errors, and content application (Dillman, 2009). It was tested with a pilot group of participants and evaluated to determine

reliability of each construct. The pilot group utilized was a sixth grade class with similar race/ethnicity demographics of the population.

Pilot Study

A pilot study of the quantitative data collection (survey) was conducted to determine the reliability and validity of each construct and item within the instrument. A case study school agriscience connections class of twenty-four sixth grade students was selected at random to participate in the pilot study and was not included in the actual study.

Pilot questionnaire constructs

The first construct, Construct One – Cultivation, had ten items that related to cultivation activities with the school garden (planting, watering, etc.). A Cronbach's Alpha score of 0.736 was reached after evaluating the data within the Statistical Package for the Social Sciences (SPSS). A reliability coefficient of 0.70 or higher is considered acceptable, so a score of 0.736 suggested a relatively high internal consistency of the construct items and scale reliability (Davis, 1971).

The second construct, Construct Two – Culinary, had eight items that related to culinary activities that took place within the school garden program (cooking produce, eating from the garden, etc.). A Cronbach's Alpha score of 0.860 was reached after evaluating the data within SPSS. A score of 0.86 suggested a relatively high internal consistency of the construct items and scale reliability.

The third construct, Construct Three – Social, had eight items that related to social activities within the garden (teamwork, leadership, etc.). A Cronbach's Alpha score of 0.698 was

reached, which was close to the reliability coefficient of 0.70 that is considered acceptable. However, item seven, “I like showing younger kids how to work in the garden,” was determined to not be a valid statement for all participants in the study by the panel who analyzed the item for validity. The removal of item seven raised the Cronbach’s Alpha to 0.704, which was an acceptable score that suggested a relatively high internal consistency of the construct items and scale reliability (Table 1).

Table 1

Construct Three Cronbach’s Alpha if Items Were Deleted

Item-Total Statistics

Items for Construct Three – Social	Cronbach's Alpha if Item Deleted
S1	.658
S2	.657
S3	.606
S4	.693
S5	.695
S6	.684
S7	.704
S8	.637

Table 2 below presents the Cronbach’s Alpha scores of each construct in the pilot study and whether or not that construct was reliable. It also includes the Cronbach’s Alpha after the removal of item seven from Construct Three – Cultivation.

Table 2

Pilot Study Questionnaire Constructs and Corresponding Reliabilities

Constructs	Cronbach's Alpha	Number of Items	Reliable?
Construct One – Cultivation	0.736	10	Yes
Construct Two – Culinary	0.860	8	Yes
Construct Three – Social (Before Item #7 removal)	0.698	8	No
Construct Three – Social (After Item #7 removal)	0.704	7	Yes

Final Instrument

The final quantitative instrument (Appendix E) looked very similar to the pilot instrument. Construct one (Cultivation) and construct two (Culinary) remained the same because the Cronbach's Alpha indicated that they were reliable and the researcher, the agriscience teacher at the case study school, and a panel of university professors found them valid. Construct three (Social) had item seven, "I like showing younger kids how to work in the garden" removed from the final instrument. Not only did its removal raise the reliability of the construct, but it was not a valid question because not all participants had the opportunity to work with younger children in the garden, thus it was not applicable to all participants. This issue with item seven's validity was pointed out by the agriscience teacher. Once that item was removed, the final survey instrument was evaluated by a panel again for validity, and all concluded that the instrument was valid.

Data Collection

As stated previously, active parental consent was required for this study. After gaining University of Georgia (UGA) Institutional Review Board (IRB) approval and permission from the case study school to conduct the study, a parent consent form, including a cover letter

explaining the study and any risks involved (Appendices A, B, I, J, and K) was sent home with all students in the agriscience connections courses. Even though the literature indicated that a lower response rate and approval rate were expected when consent forms are sent home with students instead of given to parents directly (Stein et al., 2007), due to time constraints of the study and issues with accessing parents directly, student-distributed consent forms were the only feasible option.

The teacher reminded the students to return the forms daily over a period of three weeks, either verbally or by a note on the classroom's whiteboard. Parent consent forms were given to each of the 232 students three times to be taken home to their parents by their teacher, even if they had already returned a form, during the three weeks. Of the 696 forms that were given to the teacher to distribute to students so that every child would have three consent forms, only 464 were actually distributed, averaging that each child only received two forms instead of three. During the second week of consent form distribution, an amendment was made to the UGA IRB to allow the use of an enticement, a clementine to eat in class, as an incentive for students who returned the consent forms.

Of the 232 students, 24 were included in the pilot study and were not able to participate in the actual study, resulting in 208 eligible students to participate in the study. Only 45 parent consent forms were returned to the teacher to indicate that students could participate in the study. The 45 students were given a child assent form (Appendix C), as required by IRB, to complete, and if they were willing to participate, were given a survey to fill out in class in front of the researcher during the fourth week of the study. Of the 45 students, 39 were willing to participate in the quantitative survey in class. While child-distributed consent forms consistently result in a

low response rate, due to time constraints of the study and the case study school, it was the most applicable way to distribute consent forms for this study.

A response rate of 21.6% (n=45) was obtained from the parent consent forms, and of those 18.8% (n=39) students agreed to participate in the study. An introductory cover letter was included in the parent consent form (Appendices A and B) to increase participation, but as seen in a study completed by Woodruff et al. (2006), introductory letters appeared to have little or no significant effect on the response rate from parents allowing their children to participate in the study, so they were not helpful in increasing the parent response rate. The researcher also believes that because this was a required course, students who are not interested in agriculture may not have felt impelled to participate in the study or in the agricultural-related clubs, such as FFA and the Sustainability Garden Corps.

Qualitative Data Collection Procedures

Focus Group

A focus group was incorporated into the study to provide a more in-depth qualitative aspect to accompany the quantitative data collected through surveys. All parents were asked in the consent forms if they would consent to allow their children to participate in the focus group, which was to be held after school during an FFA meeting. Of the 45 parent consent forms returned, 30 parents (66.7%) indicated that their children could participate in the focus group. However, of those 30 children, only four were present during the after school FFA meeting on a Thursday in December 2014 when the focus group took place, thus resulting in a convenience sample of participants. The date of the focus group was selected by the agriscience connections

teacher of the case study school and was conducted during an FFA meeting to hopefully have more students present than if they were asked to stay after school for the focus group only.

When the four students were pulled to complete the focus group they were given an additional child assent form (Appendix C) to read over, per IRB requirements, and complete if they wanted to participate. All four students agreed to participate in the focus group. Students were then given a quantitative survey to complete if they had not already done so in class. After the completion of surveys each participant was given a copy of the survey questions to follow along with during the focus group. They were also offered refreshments before and during the focus group. An audio recorder was set up to record the discussion (so a transcription could be made later) and the researcher was the focus group facilitator. The researcher took notes on the responses to each question to assist with the transcription process and to build connections within answers. After each participant was given time to answer a question, the facilitator moved on to the next question. After all six main guiding questions were asked, the participants were asked if they had anything to add, thanked for their time, and the focus group concluded. The focus group took about fifteen minutes total.

Guiding discussion questions

The guiding questions for the focus group were created specifically for the study to reflect on the three construct items within the questionnaire. They also focused on learning greater details from participants on what they enjoyed about the garden and how they believed it had impacted their life choices. The final version of the question set consisted of six questions (Appendix F).

1. Do you like working in the garden? Why or why not?

2. What is the most important aspect of the garden? Why?
3. What is your favorite part of the garden? Why?
4. What is the biggest impact that the garden has had on your life?
5. Do you feel like working in the garden has changed any of your habits? If so, which ones? Why or Why not?
6. Has working in the garden changed how you make food choices at school?

Data Analysis

Quantitative Questionnaire

The responses for the completed questionnaires were entered into SPSS for data analysis. Cronbach's alpha was utilized to determine internal consistency. Frequencies, percentages, and means were calculated for each applicable demographic item. Frequencies, percentages, means, and standard deviations were calculated within each construct to determine which aspect of the school garden program had the greatest positive outcome on the participants. Independent Sample T-Tests were conducted on bivariate demographic items to determine if any significant differences existed between the different groups based on construct scores. ANOVA tests were conducted on multivariate demographic items to determine if any significant differences existed between the different groups based on construct scores, and assumptions of the ANOVA test were verified prior to data analysis. These statistical tests were utilized to determine if demographic factors influenced responses within constructs. An alpha level of 0.05 was set a priori for tests of significance.

Qualitative Focus Group

The audio recording of the fifteen minute focus group was transcribed verbatim by the researcher. The transcript (Appendix G) was then analyzed through the process of domain analysis, which searched for similar themes throughout the focus group. The researcher utilized color-coding to identify the similar themes. The researcher also had a peer reviewer analyze the transcript in the same manner to check the analysis and determine if the themes did exist. To view all codes found within the transcript see Appendix H.

Chapter Four – Results

Purpose and Objectives

The purpose of this study was to determine what aspect of school garden programs had the greatest positive outcome on urban middle school youth. Aspects included cultivation, culinary, and/or social components in which urban middle school youth participants had been involved within their school garden program. A quantitative questionnaire was used to measure the outcome on students who work in the school garden and a focus group of participating students was conducted to acquire additional information. The objectives of this study were (1) to determine demographics of the study participants; (2) to determine if garden cultivation (propagating, planting, caring for, and harvesting) had a positive outcome on urban middle school youth; (3) to determine if culinary components (food preparation and consumption of school garden produce) had a positive outcome on urban middle school youth; (4) to determine if socialization with family and peers in the garden had a positive outcome on urban middle school youth; and (5) to gather personal perspectives from active students through a focus group in the qualitative aspect of study.

The results from this study were presented below along with the specific research objective.

Research Objective #1

Determine demographics of the study

Population Demographics

Out of the 39 total surveys, there were 31 completed surveys and 8 partially completed surveys. The demographics are presented as valid percentages to account for missing responses. The average age of participants was 12.25 years old with a standard deviation of 1.14. The remaining demographics are presented in the table below (Table 3) and are represented through valid percentages. The racial demographics of the study (43% African American, 41% white, 2.6% Asian/Pacific Islander, 7.7% Hispanic, and 5.1% two or more races) were close to the demographics of the school (48% African-American, 32% white, 3% Asian, 12% Hispanic, 5% two or more races), making this sample representative of the student population at the case study school (*Clarke Middle School Information*, 2011).

Table 3

Participant Responses to Demographic Items Reported in Valid Percentages

Demographic Item	Valid Percent (%)					
Race	43.6 (n=17) African American	41.0 (n=16) White	0.0 (n=0) Alaskan/ Native American	2.6 (n=1) Asian/ Pacific Islander	7.7 (n=3) Hispanic/ Latino	5.1 (n=2) Two or More Races
Age	30.8 (n=12) 11 years old	30.8 (n=12) 12 years old	25.6 (n=10) 13 years old	7.7 (n=3) 14 years old	5.1 (n=2) 15 years old	
Grade	44.7 (n=17) 6 th	28.9 (n=11) 7 th	26.3 (n=10) 8 th			
Gender	34.2 (n=13) Male	65.8 (n=25) Female				
Number of semesters in an agriculture class	51.4 (n=19) One	27.0 (n=10) Two	13.5 (n=5) Three	8.1 (n=3) Don't remember		
FFA member	15.4 (n=6) Yes	84.6 (n=33) No				
Sustainability Garden Corps member	20.5 (n=8) Yes	79.5 (n=31) No				
Does your family have a vegetable garden at home?	48.7 (n=19) Yes	51.3 (n=20) No				

Research Objective #2

To determine if garden cultivation (propagating, planting, caring for, and harvesting) had a positive outcome on urban middle school youth

Cultivation Construct Means and Percentages

To analyze Construct One – Cultivation means were taken of each item and percentages of answer choices (Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree) were collected for each item (Table 4). Based on the percentage levels of answer choices it appeared students preferred hands-on activities that involved caring for the garden – 69.2% of students either agreed or strongly agreed that “Watering is really fun”, 51.3% of students either agreed or strongly agreed with the statement “I like to watch the seeds grow into plants”, and 78.4% either strongly disagreed or disagreed with the statement “I don’t like having to care for the plants” (which reveals a positive feeling towards caring for the garden) – and enjoyed harvesting garden produce – 59.4% either agreed or strongly agreed with the statement “I like picking vegetables the best.” However, students did not seem to favor cultivation tasks that were considered dirty or labor intensive – 51.2% strongly disagreed or disagreed with the statement “I like to look for insects in the garden” and 38.4% strongly disagreed or disagreed with the statement “I like moving compost to the garden.”

The summative mean of the construct was taken (after converting items four and six into positively worded items), and resulted in a mean of 34.8 and a standard deviation of 6.69, which implied that the participants had positive outcomes in regards to cultivation aspects of a school garden program. This construct had the highest summative mean, which indicated that it had the greatest positive outcome on participants.

Table 4

Construct One – Cultivation – Responses Reported as Valid Percentages and Means

Item #	Construct Items	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean of Item Responses (1-5)
1	Sowing seeds is my favorite part of the garden.	0.0	12.8	51.3	28.2	7.7	3.31
2	I like to look for insects in the garden.	33.3	17.9	20.5	15.4	12.8	2.56
3	I like to watch the seeds grow into plants.	7.7	15.4	25.6	30.8	20.5	3.41
4	I don't like having to care for the plants.	54.1	24.3	10.8	8.1	2.7	1.81
5	Planting the small plants from the greenhouse is really fun.	5.1	17.9	25.6	17.9	33.3	4.19
6	I don't like digging in the soil.	38.5	25.6	15.4	12.8	7.7	2.26
7	Watering is really fun.	5.1	5.1	20.5	17.9	51.3	4.05
8	I like picking vegetables the best.	2.7	8.1	29.7	18.9	40.5	3.86
9	Pulling weeds is fun.	23.1	17.9	15.4	28.2	15.4	2.95
10	I like moving compost to the garden.	25.6	12.8	30.8	20.5	10.3	2.77

Significant Differences between Groups

Statistical tests were run using SPSS on Construct One – Cultivation data to look for any significant differences between groups of participants. One-Way ANOVAs and Independent Sample T-Tests were utilized to determine if there were any significant differences in the ways that cultivation aspects of school gardens impacted different demographic groups. There were no

significant differences between race/ethnicity, ages, grade level, genders, number of semesters enrolled in an agriculture class, FFA membership, or Sustainability Garden Corps membership, (all p-values were above 0.05). A significant difference did exist between students who did or did not have a vegetable garden at home (p-value = 0.026, t-value = 2.331) because the p-value was less than 0.05 and the t-value was greater than 2.024. The mean for the students who answered “Yes” to the item “Does your family have a vegetable garden at home?” (37.35) was higher than the mean of students who answered “no” (32.39), which revealed a more positive experience with the cultivation construct of students who had a vegetable garden at home.

Research Objective #3

To determine if culinary (food preparation and consumption of school garden produce) had a positive outcome on urban middle school youth

Culinary Construct Means and Percentages

To analyze Construct Two – Culinary means were taken of each item and percentages of answer choices (Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree) were collected for each item (Table 5). Based on the percentage levels of answer choices, it appeared students greatly enjoyed culinary aspects of school garden programs, with all construct items having at least 60% of respondents agreed or strongly agreed for each positive item. Students either agreed or strongly agreed (84.7%) that “Cooking in class is fun,” and 68.4% either strongly disagreed or disagreed with the statement “I don’t like vegetables.” Respondents also had positive views of consuming produce that were grown at the school – 69.3% of students either agreed or strongly agreed with the statement “I like eating the vegetables from the garden”, 76.9% of students either agreed or strongly agreed with the statement “I like seeing

what I grew in the garden bar at school”, and 61.5% of students either agreed or strongly agreed with the statement “I like vegetables more now that I have worked in the CMS Garden.”

The summative mean of the construct was taken (after converting item four into a positively worded item), and it resulted in a mean of 32.3 and a standard deviation of 6.6, which implied that the participants had positive outcomes in regards to culinary aspects of a school garden program.

Table 5

Construct Two – Culinary – Responses Reported as Valid Percentages and Means

Item #	Construct Items	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean of Item Responses (1-5)
1	I like eating the vegetables from the garden.	2.6	2.6	25.6	30.8	38.5	4.00
2	It is fun to eat what we grow at school.	7.7	2.6	20.5	28.2	41.0	3.92
3	I like seeing what I grew in the garden bar at school.	2.6	7.7	12.8	28.2	48.7	4.13
4	I don't like vegetables.	52.6	15.8	18.4	10.5	2.6	1.95
5	Cooking in class is fun.	0.0	7.7	7.7	10.3	74.4	4.51
6	I like taking food home to share with my family.	5.1	12.8	5.1	17.9	59.0	4.13
7	I like vegetables more now that I have worked in the CMS Garden.	10.3	5.1	23.1	35.9	25.6	3.62
8	My family likes the vegetables I bring home.	10.3	5.1	20.5	15.4	48.7	3.87

Significant Differences between Groups

Statistical tests were run using SPSS on Construct Two – Culinary data to look for any significant differences between groups of participants. One-Way ANOVAs and Independent Sample T-Tests were utilized to determine if there was a significant difference in the way that culinary aspects of school gardens impacted different demographic groups. There were no significant differences between race/ethnicity, ages, grade level, genders, number of semesters enrolled in an agriculture class, FFA membership, Sustainability Garden Corps membership, and if a student had a vegetable garden at home or not (all p-values were above 0.05).

Research Objective #4

To determine if socialization with family and peers in the garden had a positive outcome on urban middle school youth

Social Construct Means and Percentages

To analyze Construct Three – Social means were taken of each item and percentages of answer choices (Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree) were collected for each item (Table 6). Students appeared to have enjoyed working with others in the garden – 89.8% of respondents either agreed or strongly agreed with the statement “I like working with my friends in the garden” (no participants strongly disagreed or disagreed with this statement), 78.9% either agreed or strongly agreed that “Working in teams in the garden is fun,” and 76.9% either agreed or strongly agreed with the statement “I enjoy spending time with college students in the garden.” Inversely, students appeared to not enjoy working individually – 48.7% either strongly disagreed or disagreed with the statements “I like working alone in the garden,” and “I feel like I get more out of it if I work alone in the garden.” Leadership was also

mentioned as 51.3% of participants either agreed or strongly agreed with the statement “I feel like a leader when I work in the garden.”

The summative mean of the construct was taken and resulted in a mean of 24.9 and a standard deviation of 3.99, which implied that the participants had positive outcomes in regards to social aspects of a school garden program.

Table 6

Construct Three – Social – Responses Reported as Valid Percentages and Means

Item #	Construct Items	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean of Item Responses (1-5)
1	I like working with my friends in the garden.	0.0	0.0	10.3	15.4	74.4	4.64
2	I like parent volunteer days.	10.3	20.5	28.2	12.8	28.2	3.28
3	I feel like a leader when I work in the garden.	2.6	7.7	38.5	12.8	38.5	3.77
4	I like working alone in the garden.	33.3	15.4	35.9	7.7	7.7	2.41
5	Working in teams in the garden is fun.	2.6	5.3	13.2	28.9	50.0	4.18
6	I feel like I get more out of it if I work alone in the garden.	28.2	20.5	35.9	2.6	12.8	2.51
7	I enjoy spending time with college students in the garden.	2.6	2.6	17.9	41.0	35.9	4.05

Significant Differences between Groups

Statistical tests were run using SPSS on Construct Three – Social data to look for any significant differences between groups of participants. One-Way ANOVAs and Independent Sample T-Tests were utilized to determine if there was a significant difference in the way that social aspects of school gardens impacted different demographic groups. There were no significant differences between race/ethnicity, grade level, genders, number of semesters enrolled in an agriculture class, FFA membership, Sustainability Garden Corps membership, and if a student had a vegetable garden at home or not (all p-values were above 0.05). A statistically significant difference did exist between ages of students (F-value = 2.656, p-value = 0.05) because the F-value was greater than 1.00 and the p-value was equal to 0.05. A post-hoc Tukey test conducted revealed no practical significance between different ages of students. However, there was a large difference in means of students who were within the normal age range for middle school in comparison to students who were older than this normal age range – 11 year olds had a mean of 24.0, 12 year olds had a mean of 23.9, and 13 year olds had a mean of 24.9 (normal age range of middle school students), while 14 year olds had a mean of 29.67 and 15 year olds had a mean of 30.0 (above normal age range of middle school students).

Research Objective #5

Gather personal perspectives from active students through a focus group in the qualitative aspect of study

Focus Group Results

The focus group was utilized to gain more in-depth information from participants about their garden experience and what outcomes had occurred within their lives based on their

participation in the school garden program. There were four students who participated in the focus group. Three identified as white and one identified as Hispanic/Latino. Two students were 11, one was 12, and one was 13. Two were in 6th grade, one was in 7th grade, and one in 8th grade. All students in the focus group were female and had taken one semester of an agriculture class. Three were FFA members and two were members of Sustainability Garden Corps, and only one student had a garden at home. They were asked questions about why they liked working in the garden, if working in the garden had effected their eating habits, and what had the greatest impact on them. Their answers were coded to fit within the three constructs and top themes were pulled from the data. The question set consisted of six questions (Appendix F).

1. Do you like working in the garden? Why or why not?
2. What is the most important aspect of the garden? Why?
3. What is your favorite part of the garden? Why?
4. What is the biggest impact that the garden has had on your life?
5. Do you feel like working in the garden has changed any of your habits? If so, which ones? Why or Why not?
6. Has working in the garden changed how you make food choices at school?

The focus group audio was recorded and transcribed verbatim by the researcher. A domain analysis was conducted on the transcript by the researcher and a peer reviewer to determine common themes that arose during the focus group. Twenty-five codes were found within Construct One – Cultivation, 20 codes were found within Construct Two – Culinary, and 20 codes were found within Construct Three – Social. A surprising find during the study was the insistence of participants that every school should have a garden, and five codes were found

within this theme (Appendix H). Within each construct, several top themes were identified and supported by quotes from the transcript (Table 7).

Table 7

Domain Analysis – Common Themes from Each Construct and Findings Identified in Focus

Group

Construct One – Cultivation – 25 codes

Top Themes – Closer to nature; Harvesting; Caring for the garden; Composting; See how food is grown

Quotes – “Enjoy putting my hands in dirt;” “You get closer to nature;” “You get to harvest food;” “I really like watering...and taking care of everything;” “We compost more at school;” “Before...I would just throw it away but now I compost it;” “Fun to see how your food is grown.”

Construct Two – Culinary – 20 codes

Top Themes – See where food comes from; Eat healthier; Garden bar at school; Cooking at school

Quotes – “Seeing where your food comes from and...eat it in the school cafeteria;” “I eat healthier... I like more vegetables now;” “Now I try them [vegetables] and see if I like them;” “We do a garden bar of the vegetables that we grow;” “I kind of wish it [the garden bar] was more often;” “Cooking...we made radish soup...in Sustainability Corps and it was really good.”

Construct Three – Social – 20 codes

Top Themes – Leadership; Teamwork; Individual work; Responsibility

Quotes – “You can be a leader;” “I like leading the groups;” “The garden... has lead me to do tours [for the school]...and I get to talk about...the garden and how it impacts the school;” “I like working with other people if I am in charge;” “You feel like you are a part of something;” “If I feel like I am going to get more done by myself I just work by myself;” “It teaches people responsibility.”

Feelings About School Gardens – 5 codes

Top Themes – Fun; More schools should have gardens

Quotes - “I think it is fun;” “They should have [more school gardens] at schools;” “I think everyone needs a big garden;” “In areas that need [school gardens] like in city schools and places like that where kids don’t necessarily have access to the healthiest of foods.”

Chapter Five – Discussions and Recommendations

Purpose and Objectives

The purpose of this study was to determine what aspect of school garden programs had the greatest positive outcome on urban middle school youth. Aspects included cultivation, culinary, and/or social components in which urban middle school youth participants had been involved within their school garden program. The objectives of this study were:

1. Determine demographics of the study;
2. To determine if garden cultivation (propagating, planting, caring for, and harvesting) had a positive outcome on urban middle school youth;
3. To determine if culinary components (food preparation and consumption of school garden produce) had a positive outcome on urban middle school youth;
4. To determine if socialization with family and peers in the garden had a positive outcome on urban middle school youth; and
5. Gather personal perspectives from active students through a focus group in the qualitative aspect of study.

Review of Methods

This study took a mixed methods approach to ensure the collection of measurable quantitative data and to gather additional, in depth qualitative data from participants through the use of a focus group. A survey instrument (Appendix E) was created by the researcher as the

quantitative method to collect data from participants. Active parent consent forms (Appendices A and B) were distributed over a three week period three times by the agriscience teacher at the case study school to all students enrolled in the class. While research showed that active parent consent forms that are sent home with students resulted in a low response rate and approved consent rate, due to time constraints and no direct access to parents by the researcher, student sent home forms were the only viable option. Of the 696 forms that were given to the teacher to distribute to students so that every child would have three consent forms, only 464 were actually distributed, averaging that each child only received two forms instead of three. A pilot study was conducted to test the reliability and validity of the survey instrument (n = 24) before the study (Appendix D). All constructs were determined reliable (after determining the Cronbach's alpha through the use of SPSS), except for the third construct, Construct Three – Social, which then had an item removed to make it reliable (Tables 1 and 2). A paper survey was utilized because it allowed for direct contact with participants and ensured that only students with parent consent were allowed to participate.

The quantitative instrument asked the participants about their feelings towards cultivation, culinary, and social aspects of a school garden program, as well as demographics. The responses (n = 39) were then analyzed using SPSS to find the percentages and means for each item, construct means, and determine if significant differences existed with demographics. The qualitative focus group was conducted with four students who were present on the set date during an after school FFA meeting. The participants were asked more in depth questions about each construct of the quantitative survey and were asked what their favorite aspects and the most important aspects of the school garden program were.

Discussion of Population

The demographic information that was gathered through the quantitative instrument provided much more information for the sample than what was provided by the case study school. Age, gender, and grade level numbers were not released by the case study school. Table 8 shows a race/ethnicity demographics comparison of the sample population and the school population. While not exactly the same demographic percentages, the sample population is a close representation of the school population. Unfortunately, inferences cannot be made about the demographics of the study because enrollment in the course is not optional.

Table 8

Race/Ethnicity Demographic Comparison between Sample Population and School Population

Race/Ethnicity	Sample Population (%)	School Population (%)
African American	43.6	48.0
White	41.0	32.0
Alaskan/ Native American	0.0	0.0
Asian/ Pacific Islander	2.6	3.0
Hispanic/ Latino	7.7	12.0
Two or More Races	5.1	5.0

Summary of Combined Quantitative and Qualitative Findings

Overall, the data revealed several encouraging trends present in urban middle school youth in regards to school garden programs. Participants agreed that overall there were positive outcomes on participants of cultivation, culinary components, and social aspects of school garden programs, which can be determined from the summative means for each construct and from the codes collected within the qualitative data: Construct One – Cultivation had a summative mean of 34.8 and 25 codes collected, Construct Two – Culinary had a summative

mean of 32.3 and 20 codes collected, and Construct Three – Social had a summative mean of 24.9 and 20 codes collected.

Research Objective #2

To determine if garden cultivation (propagating, planting, caring for, and harvesting) had a positive outcome on urban middle school youth

Construct One – Cultivation, had the highest summative mean of the three constructs, which indicated that students agreed or strongly agreed with more statements within the cultivation construct than the other two. There was a significant difference discovered between students who did or did not have a vegetable garden at home. A higher mean was determined for students who answered “yes” to the item “Does your family have a vegetable garden at home?” than the mean of students who answered “no,” which revealed a more positive experience with the cultivation construct of students who had a vegetable garden at home. This could be because they had previous experiences with gardening and were therefore accustomed to the more labor-intensive tasks than students who had never worked in a garden. This was also supported by the theoretical framework in relation to social cognitive theory – learners are more comfortable completing a task that they have experience in when working with others than they are if they are attempting something new.

The positive mean revealed that students overall do enjoy the cultivation aspects of garden programs, as supported in other studies (Graham et al., 2005; Ballentine, 2011; Ratcliffe et al., 2009). These studies also support the qualitative data collected, which indicated a strong preference of cultivation aspects of the garden (Table 7). Composting was a surprising major theme present within the qualitative data collecting in relation to this construct, but after

reflecting on the in-school composting program that was present in the cafeteria at the case study school it was positive that the composting program had such an impact on students (“Before...I would just throw it away but now I compost it”).

Research Objective #3

To determine if culinary (food preparation and consumption of school garden produce) had a positive outcome on urban middle school youth

Construct Two – Culinary had the second highest summative mean. This positive outcome was supported by a study conducted by Quick et al. (2010) to determine if it was possible to create school-based nutrition curriculum with the incorporation of school garden activities. After conducting interviews and surveys with stakeholders and implementing nutrition curriculum, they concluded that school-based garden programs were an appropriate step towards nutrition curriculum and “The school garden as an experiential learning approach was highly valued by students, teachers, and parents alike” (p. 128). This greater positive outcome was also supported by a study conducted by Ratcliffe et al. in 2009. Their study focused on vegetable consumption of low-income, urban middle school-aged students who were or were not involved in a school garden program and their abilities to identify different produce, as well as their willingness to try new vegetables and overall regular vegetable consumption. Results indicated that students who were involved in the school garden program could correctly identify more vegetables than those who were not in the school garden program and that they had a higher preference to consume vegetables, especially those that were grown in their school garden.

No significant differences were found between any demographic groups within the culinary construct, which indicated that no matter the race, age, gender, number of times students

had taken an agriculture class, were members of FFA or the Sustainability Garden Corp, or if they had a garden at home, students overall had a positive outcome from this construct.

Research Objective #4

To determine if socialization with family and peers in the garden had a positive outcome on urban middle school youth

The Construct Three – Social mean revealed that students indicated a positive outcome of socialization aspects of school garden programs. The items that had the highest means were items that related to working with others and incorporating teamwork into garden tasks. This positive feeling of teamwork was supported by Robinson and Zajicek (2005), who determined that students who were involved in school garden programs had increased life skills, such as teamwork and leadership.

The only statistically significant difference that existed was between ages of students. While no practical significance was supported, there was a large difference in means of students who were within the normal age range for middle school in comparison to students who were older than this normal age range. The research believes that this higher social mean existed within older students because they had a higher maturity level than students who were pre-teen. The sample size of older students was small (only five participants were 14 or 15 years old) which was due to the fact that students of this age are normally in high school, thus there was a smaller population of students this age than of the students within the normal middle school age range (11-13 years old).

The focus group data revealed more positive feelings towards working with others in the garden and also feelings of belonging and community, as mentioned in other studies (Ratcliffe,

2007; Dymont & Bell, 2008; Cutter-Mackenzie, 2009). Students within the focus group said that “You feel like you are a part of something” when involved in a school garden.

Research Objective #5

Objective #5 - Gather personal perspectives from active students through a focus group in the qualitative aspect of study

A surprising find within the qualitative study was the insistence of students that “everyone needs a big garden.” When asked at the end of the focus group if students had anything else they wanted the researcher to know, all students agreed that more schools should have gardens, especially “In areas that need [school gardens] like in city schools and places like that where kids don’t necessarily have access to the healthiest of foods.” This revealed to the researcher that students did not just think gardens were enjoyable, but that they saw that they had positive outcomes on their lives and believed that others should have similar opportunities to learn and grow through school garden programs.

Recommendations for Future Research

There are several recommendations for future research that were determined through this study to determine what aspect of school garden programs had the greatest positive outcome on urban middle school youth. This study was done focusing on one inner-city middle school with a high number of low-income students with a small sample size. A larger sample size of this school and of schools from similar and different demographics should be conducted to be able to generalize these results and determine if there are differences between different types of schools

and students. This would provide a more complete evaluation of school garden programs in different environments and school demographics.

In future studies the researcher recommends that passive parent consent is sought, instead of active parent consent, and that direct parent contact be made instead of sending home consent forms with students. Passive parent consent consistently has higher response rates than active parent consent (Courser et al., 2009). Also, direct contact with parents from the researcher has shown to have a higher response rate than student delivered consent forms (Stein et al., 2007). The researcher also depended on school staff to distribute consent forms instead of distributing them in person, which resulted in a percentage of the consent forms not being distributed properly. Of the 696 consent forms given to the school for distribution (three per student), only 464 were distributed, resulting in an average of two forms per student. It was not also clear if every child received two forms or if they were given sporadically. This poor distribution was due to the school staff taking on the responsibility of distributing forms along with their other responsibilities (teaching twelve classes), and it was forgotten or pushed to the wayside. If student-distributed forms are the only means of distribution available (like in the case of this study), the researcher recommends that the researcher pass out the forms instead of depending on others because then the researcher can guarantee that proper study protocol has been followed.

The researcher had assumed that the culinary construct would have the greatest positive outcome on students because they would enjoy cooking in class. However, it did not have the highest summative mean of all constructs within the quantitative data. More research should be done on the culinary aspects of school garden programs to determine how to create a more positive outcome on students in relation to culinary components of programs.

While studies had shown a benefit of parent volunteers in school garden programs (Townsend et al., 2014) and students indicated that they enjoyed working with adult volunteers, it would be interesting to research if there is an impact on families gardening together and if home gardens have a similar outcome on students as school gardens do. Students in this study who had a garden at home were significantly different than students who did not have a garden at home in regards to the cultivation construct, and it would be interesting to pursue that further.

The researcher also believes that their items for Construct Three – Social, were not encompassing of all social aspects of a garden program, such as the development of life skills. A more sensitive instrument should be developed to learn more about the social aspects of school garden programs. This has been pursued with elementary aged students (Robinson & Zajicek, 2005), but more research should be done at the middle and high school level on more in-depth social development in relation to school garden programs.

Relevance Statement

This research revealed that students felt that cultivation aspects of school gardens had the greatest positive outcome upon them. While social and culinary aspects were also important, cultivation aspects had the greatest outcome on students and was a significant life experience for them. Cultivation in the school garden was a significant life experience because it impacted students' behaviors and interests away from school, such as composting at home. Therefore, it was important for school garden programs to incorporate a cultivation aspect into the school garden program and encourage students to care for and grow their own food.

References

- 2014 annual performance report. (2014). Retrieved 03/22/2015, from <http://www.clarke.k12.ga.us/files/filesystem/Clarke%20Middle%20%28Final%20Combined%29.pdf>
- 2014-15 Georgia FFA chapters. (2015). Retrieved 03/18/2015, from <http://www.gaaged.org/Association/>
- AmeriCorps VISTA. (2015). Retrieved 03/01/2015, from <http://www.nationalservice.gov/programs/ameri-corps/ameri-corps-vista>
- “Aspect” (2015). Retrieved on 4/20/15, from <http://www.merriam-webster.com/dictionary/aspect>
- Ballentine, J. (2011). Georgia Organics Farm to School Initiative final evaluation report.
- Bandura, A. (1986). *Social foundations of thought and action*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W.H. Freeman and Company.
- Blair, D. (2009). The child in the garden: An evaluative review of the benefits of school gardening. *Journal of Environmental Education*, 40 (2), 15-38.
- Bloor, M., Frankland, J., Thomas, M., & Robson, K. (2001). *Focus groups in social research: Introducing qualitative methods*. Thousand Oaks, CA: SAGE Publications Ltd.
- Boone, H. (2011). Innovative middle school programs. *The Agricultural Education Magazine*, 83 (5), 2.
- Boyer, R., McFarland, A., Zajicek, J., & Waliczek, T. (2011). Growing minds: Gardening and parent involvement in elementary schools. *Journal of Therapeutic Horticulture*, 21 (2), 8-26.
- Characteristics of middle grade students, (1989). *Caught in the Middle*. Sacramento: California Department of Education, 144-148.
<http://pubs.cde.ca.gov/tcsii/documentlibrary/characteristicsMG.aspx>

- Chawla, L. (2006). Research methods to investigate significant life experiences: review and recommendations. *Environmental Education Research*, 12 (4), 359-374. doi:10.1080/1350462060094284
- Cherry, K. (2015). *What is experiential learning?* Retrieved 03/18/2015, from <http://psychology.about.com/od/educationalpsychology/a/experiential-learning.htm>
- Clarke Middle School information. (2011). Retrieved 03/22/2015, from <http://publicschools.k12.ga.us/clarke-county/130117000443.html>
- Compost. (2015). Retrieved 03/01/2015, from <http://dictionary.reference.com/browse/compost?s=t>
- Courser, M. W., Shamblen, S. R., Lavrakas, P. J., Collins, D., & Ditterline, P. (2009). The impact of active consent procedures on nonresponsive and nonresponse error in youth survey data: Evidence from a new experiment. *National Institutes of Health Public Access*, 33 (4), 370-395. doi:10.1177/0193841X09337228.
- Culinary. (2015). Retrieved 03/01/2015, from <http://dictionary.reference.com/browse/culinary?s=t>
- Cultivate. (2015). Retrieved 03/01/2015, from <http://dictionary.reference.com/browse/cultivate>
- Cutter-Mackenzie, A. (2009). Multicultural school gardens: Creating garden spaces in learning about language, culture, and environment. *Canadian Journal of Environmental Education*, 14, 122-135.
- Davis, J. A. (1971). *Elementary survey analysis*. Englewood Cliffs, NJ: Prentice Hall.
- Dillman, D. A., Sinclair, M. D., & Clark, J. R. (1993). Effects of questionnaire length, respondent-friendly design and a difficult question on response rates for occupant-addressed census mail surveys. *Public Opinion Quarterly*, 57 (3), 289-304.
- Dillman, D. A., Smyth, J. D., Christian, L. M. (2009). *Internet, mail, and mixed-mode surveys: The tailored design method (3rd ed.)*. Hoboken, NJ: John Wiley & Sons, Inc.
- Dyment J., & Bell A. (2008) "Our Garden Is Colour Blind, Inclusive and Warm": Reflections on green school grounds and social inclusion. *International Journal of Inclusive Education*, 12 (2):169-183.
- Emekauwa, E. (2004). *They remember what they touch: The impact of place-based learning in East Feliciana parish*. Rural School and Community Trust, Arlington, VA. Retrieved June 3, 2006, from http://www.peecworks.org/PEEC/PEEC_Research/S0009D4FB-0084FE88

- Fontinelle, A. (2015). *Are the volunteer corps right for you?* Retrieved 03/02/2015, from <http://www.investopedia.com/articles/younginvestors/07/join-the-corps.asp>
- Gibbs, H. J. (2005). It's not just in high school-agricultural education in middle school. *Techniques: Connecting education and careers*. Retrieved from www.acteonline.org/members/techniques/feb05_feature3.cfm
- Gopal, J., & Pastor, E. (2013). Indoor-outdoor science. *Science & Children*, 50 (6), 35-41.
- Graham, H., Deborah, L. B., Lussier, M., McLaughlin, P., & Zidenberg-Cherr, S. (2005). Use of school gardens in academic instruction. *Journal of Nutrition Education and Behavior*, 37 (3), 147-151.
- Hayden-Smith, R. (2011). *A brief history of school gardens*. Retrieved 03/18/2015, from <http://kgi.org/blogs/rose-hayden-smith/brief-history-school-gardens>
- Hicks, S. (2015). *Does a full year of agriscience really make a difference on student achievement of a state mandated examination?* (Unpublished University of Georgia).
- History of youth gardens. (2002). Retrieved 02/08/2015, from <http://www.hort.vt.edu/HORT6004/network/schoolgardens.html>
- Hittleman, D. R. & Simon, A. J. (2002). *Interpreting educational research: An introduction for consumers of research*. Upper Saddle River, NJ: Merrill Prentice Hall. (3rd ed.)
- Lieberman, G. A., & Hoody, L. L. (1998). *Closing the achievement gap: Using the environment as an integrating context for learning*. Paper presented at the State Education and Environmental Roundtable, San Diego, CA.
- McLeod, S. (2011). *Bandura – Social learning theory*. Retrieved 03/29/2015, from <http://www.simplypsychology.org/bandura.html>
- McLeod, S. (2013). *Kolb – Learning styles*. Retrieved 03/21/2015, from <http://www.simplypsychology.org/learning-kolb.html>
- Monroe, M. C. (2003). Two avenues for encouraging conservation behaviors. *Human Ecology Review*, 10 (2), 113-125.
- Morgan, P. J., Warren, J. M., Lubans, D. R., Saunders, K. L., Quick, G. I., & Collins, C. E., (2009). The impact of nutrition education with and without a school garden on knowledge, vegetable intake and preferences and quality of school life among primary-school students. *Public Health Nutrition: 13* (11), 1931–1940. doi:10.1017/S1368980010000959
- “Outcome” (2015). Retrieved 4/20/15 from <http://www.merriam-webster.com/dictionary/outcome>

- Quick, G. I., Morgan, P. J., Collins, C. E., Lubans, D. R., Saunders, K. L., & Warren, J. M. (2010). Process evaluation of a primary school garden-enhanced nutrition curriculum. *Australasian Medical Journal*, 3 (1), 128.
- Ratcliffe, M. M. (2007). *Garden-based education in school settings: The effects on children's vegetable consumption, vegetable preferences and ecoliteracy*. (Unpublished Doctor of Philosophy). Tufts University.
- Ratcliffe, M., Merrigan, K., Rogers, B., & Goldberg, J. (2009). The effects of school garden experiences on middle school-aged students' knowledge, attitudes, and behaviors associated with vegetable consumption. *Health Promotion Practice Online*First, 1-8. doi:10.1177/1524839909349182
- Robinson, C. W., & Zajicek, J. M. (2005). Growing minds: The effects of a one-year school garden program on six constructs of life skills of elementary school children. *HortTechnology*, 15 (3). 453-457.
- Rossetti, R. & McCaslin, N. L. (1992). An examination of middle school agricultural education and FFA programs: Survey results from state FFA executive secretaries. *Education Resources Information Center (ERIC)*, 1-9. <http://files.eric.ed.gov/fulltext/ED346302.pdf>
- Schunk, D. (2012) Social cognitive theory. *Learning theories: An educational perspective* (6th ed., pp. 117-162). Boston, MA: Pearson Education Inc.
- Social. (2015). Retrieved 03/01/2015, from <http://dictionary.reference.com/browse/social>
- Social Cognitive Theory. (2010). Retrieved 03/23/2015, from http://www.utwente.nl/cw/theorieenoverzicht/Theory%20clusters/Health%20Communication/Social_cognitive_theory/
- Somerset, S., Ball, R., Flett, M., & Geissman, R. (2005). School-based community gardens: Re-establishing healthy relationships with food. *Journal of the HEIA*, 12 (2), 25-33.
- Stein, B. D., Jaycox, L. H., Langley, A., Kataoka, S. H., Wilkins, W. S., & Wong, M. (2007). Active Parental Consent for a School-Based Community Violence Screening: Comparing Distribution Methods. *Journal of School Health*, 77 (3), 116-120.
- Townsend, M., Gibbs, L., Macfarlane, S., Block, K., Staiger, P., Gold, L., & Long, C. (2014). Volunteering in a school kitchen garden program: Cooking up confidence, capabilities, and connections! *Voluntas: International Journal of Voluntary & Nonprofit Organizations*, 25 (1), 225-247. doi:10.1007/s11266-012-9334-5
- What is agricultural education? (2015). Retrieved 03/01/2015, from <http://www.naae.org/whatisaged/>

What is farm to school? (2015). Retrieved from <http://www.farmtoschool.org/about/what-is-farm-to-school>

What is FFA? (2015). Retrieved 03/01/2015, from <https://www.ffa.org/about/what-is-ffa>

Woodruff, S. I., Mayer, J. A., & Clapp, E. (2006). Effects of an Introductory Letter on Response Rates to a Teen/Parent Telephone Health Survey. *Evaluation Review*, 30 (6), 817-823.

Appendix A – Consent Form Cover Letter

Dear Clarke Middle Parent:

Your child has been invited to participate in a research study titled “**School Garden Impact on Urban Youth**” conducted by Graduate Student Ashley Collins and Dr. Dennis Duncan with the Department of Agricultural Leadership, Education, and Communication, University of Georgia. The contact person for this study is Ashley Collins at ash2009@uga.edu.

The purpose of this research study is to determine what aspect of a school garden program impacts urban middle school youth’s food environment. In short, what aspect of a school garden impacts the students the most and makes them excited to be involved. These findings can contribute to the structure of school garden programs across the county.

If you should choose to allow your child to participate in this study, your child’s participation will involve the following:

- Completing a paper survey during their agriscience class period once.
- Potentially being part of a focus group after school, consisting of FFA members.

Completion of the survey is expected to take a maximum of 15 minutes. Once I receive the completed surveys, I will store them in a locked file cabinet off-campus and will destroy all names and contact information, if any are received. **Any information that is obtained in connection with this study cannot be connected with your child and will remain anonymous.**

Your child's participation in this study is completely voluntary. You may refuse to allow them to participate or they may withdraw at any time without penalty or loss of benefits to which they are otherwise entitled, or skip any questions they feel uncomfortable answering.

If you have any questions do not hesitate to ask now or at a later date. You may contact Ashley Collins at ash2009@uga.edu.

Thank you for the invaluable help that you are providing by allowing your child to participate in this research study.

Sincerely,

Ashley Collins

Department of Agricultural Leadership, Education, and Communication

College of Agricultural and Environmental Sciences

University of Georgia

ash2009@uga.edu

Appendix B – Parent Consent Form

School Garden Impact on Urban Youth

Researcher's Statement

We are asking your child to take part in a research study. Before you decide to allow them to participate in this study, it is important that you understand why the research is being done and what it will involve. This form is designed to give you the information about the study so you can decide whether to allow your child to be in the study or not. Please take the time to read the following information carefully. Please ask the researcher if there is anything that is not clear or if you need more information. When all your questions have been answered, you can decide if you want your child to be in the study or not. This process is called “informed consent.” A copy of this form will be given to you.

Principal Investigator: Ashley DeAnn Collins
Agricultural Leadership, Education, and Communication
Ash2009@uga.edu

Purpose of the Study

The purpose of this study is to determine what part of a school garden program impacts students the most and wants them to continue to be involved. Students will be asked questions about socializing in the garden, cooking with garden produce, and taking care of the garden.

Your child is being asked to participate because they are enrolled in the agriscience connections course at Clarke Middle School.

Study Procedures

If you agree to allow your child to participate, they will be asked to ...

- Complete a survey about their experience in the garden in their agriscience class that will take less than 15 minutes
- Potentially complete a 30 minute group interview after school during a previously scheduled FFA meeting

Risks and discomforts

- I do not anticipate any risks from participating in this research.

Benefits

- No direct benefits to participants
- To society/mankind –
 - An understanding of the part of school gardens students should be involved in
 - An increased interest in gardening among youth
 - An increase utilization of school gardens

Incentives for participation

There are no incentives for participating in this study.

Audio/Video Recording

Audio recording will be used during the group interview conducted after school for 5 participants chosen at random. Once these audio recordings have been transcribed they will be archived and only heard by the researcher.

Please provide initials below if you agree to have this audio interview recorded or not. Your child may still participate in this study even if you are not willing to have the interview recorded.

_____ I do not want to have this interview recorded.

_____ I am willing to have this interview recorded.

Privacy/Confidentiality

No data collected will include information that identifies your child directly or indirectly - the data will be collected anonymously.

Taking part is voluntary

Your child's involvement in the study is voluntary, and you may choose not to participate or to stop at any time without penalty or loss of benefits to which you are otherwise entitled.

If you decide to stop or withdraw from the study, the information/data collected from or about your child up to the point of your withdrawal will be kept as part of the study and may continue to be analyzed.

If you have questions:

The main researcher conducting this study is Ashley Collins, a graduate student at the University of Georgia. If you have questions later, you may contact Ashley Collins at ash2009@uga.edu. If you have any questions or concerns regarding your rights as a research participant should be directed to the Chairperson, University of Georgia Institutional Review Board (IRB), at 629 Boyd GSRC, Athens, GA, 30602; 706.542.3199 or irb@uga.edu.

Research Subject's Consent to Participate in Research:

To voluntarily agree to take part in this study, you must sign on the line below. Your signature below indicates that you have read or had read to you this entire consent form, and have had all of your questions answered.

Name of Student/Child

Name of Researcher

Signature

Date

Name of Parent

Signature

Date

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

Appendix C – Child Assent Form

We are doing a study on what part of school gardens middle school students enjoy the most. You are being asked to help because you are enrolled in the agriscience program at CMS and have worked in the garden.

If you agree to be in our study, we are going to ask you to rate your agreement to some statements about the garden. We want to know if you like or dislike certain parts of the school garden program. For example, we will ask you if you enjoy planting seeds in the garden and you will say you strongly disagree, disagree, neutral (you are indifferent, you do not agree or disagree), agree, or strongly agree.

You can ask questions about this study at any time. If you decide at any time not to finish, you can ask us to stop.

The questions we will ask are only about what you think. There are no right or wrong answers because this is not a test.

If you have questions:

The main researcher conducting this study is Ashley Collins, a graduate student at the University of Georgia. If you have questions later, you may contact Ashley Collins at ash2009@uga.edu. If you have any questions or concerns regarding your rights as a research participant should be

directed to the Chairperson, University of Georgia Institutional Review Board (IRB), at 629
Boyd GSRC, Athens, GA, 30602; 706.542.3199 or irb@uga.edu.

If you sign this paper, it means that you have read this and that you want to be in the study. If
you don't want to be in the study, don't sign this paper. Being in the study is up to you, and no
one will be upset if you don't sign this paper or if you change your mind later. Your grade in
your class will not be impacted by your participation in this study.

Your signature: _____ Date _____

Your printed name: _____ Date _____

Signature of person obtaining consent: _____ Date _____

Printed name of person obtaining consent: _____ Date _____

Appendix D – Questionnaire Instrument – Pilot Version

I want to know how you feel about different aspects of the school garden at Clarke Middle School! Please circle **one number** below for each statement. Neutral means you are indifferent, you don't agree or disagree with the statement(s).

I. Feelings about the garden

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Cultivation and Production					
Sowing seeds is my favorite part of the garden.	1	2	3	4	5
I like to look for insects in the garden.	1	2	3	4	5
I like to watch the seeds grow into plants.	1	2	3	4	5
I don't like having to care for the plants.	1	2	3	4	5
Planting the small plants from the greenhouse is really fun.	1	2	3	4	5
I don't like digging in the soil.	1	2	3	4	5
Watering is really fun.	1	2	3	4	5
I like picking vegetables the best.	1	2	3	4	5
Pulling weeds is fun.	1	2	3	4	5
I like moving compost to the garden.	1	2	3	4	5
Culinary					
I like eating the vegetables from the garden.	1	2	3	4	5
It is fun to eat what we grow at school.	1	2	3	4	5
I like seeing what I grew in the garden bar at school.	1	2	3	4	5
I don't like vegetables.	1	2	3	4	5
Cooking in class is fun.	1	2	3	4	5
I like taking food home to share with my family.	1	2	3	4	5
I like vegetables more now that I have worked in the CMS Garden.	1	2	3	4	5
My family likes the vegetables I bring home.	1	2	3	4	5
Social					
I like working with my friends in the garden.	1	2	3	4	5
I like parent volunteer days.	1	2	3	4	5
I feel like a leader when I work in the garden.	1	2	3	4	5
I like working alone in the garden.	1	2	3	4	5
Working in teams in the garden is fun.	1	2	3	4	5
I feel like I get more out of it if I work alone in the garden.	1	2	3	4	5
I like showing younger kids how to work in the garden.	1	2	3	4	5
I enjoy spending time with college students in the garden.	1	2	3	4	5

II. Demographics

We want to learn a little more about you. **Please circle** the correct answer for each question.

Race/Ethnicity

- African American
- Asian/Pacific Islander
- White
- Hispanic/Latino
- Native American
- Other _____

Age

- 11
- 12
- 13
- 14
- 15

Grade Level

- 6th
- 7th
- 8th

Gender

- Male
- Female

How many semesters have you taken an agriculture class? **Circle the correct answer.**

1 2 3 don't remember

Are/were you ever an FFA member? YES NO

Are/were you ever a member of the Garden Corps? YES NO

Does your family have a vegetable garden at home? YES NO

Thank you for completing this survey!

Appendix E – Questionnaire Instrument – Final Version

I want to know how you feel about different aspects of the school garden at Clarke Middle School! Please circle **one number** below for each statement. Neutral means you are indifferent, you don't agree or disagree with the statement(s).

I. Feelings about the garden

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Cultivation and Production					
Sowing seeds is my favorite part of the garden.	1	2	3	4	5
I like to look for insects in the garden.	1	2	3	4	5
I like to watch the seeds grow into plants.	1	2	3	4	5
I don't like having to care for the plants.	1	2	3	4	5
Planting the small plants from the greenhouse is really fun.	1	2	3	4	5
I don't like digging in the soil.	1	2	3	4	5
Watering is really fun.	1	2	3	4	5
I like picking vegetables the best.	1	2	3	4	5
Pulling weeds is fun.	1	2	3	4	5
I like moving compost to the garden.	1	2	3	4	5
Culinary					
I like eating the vegetables from the garden.	1	2	3	4	5
It is fun to eat what we grow at school.	1	2	3	4	5
I like seeing what I grew in the garden bar at school.	1	2	3	4	5
I don't like vegetables.	1	2	3	4	5
Cooking in class is fun.	1	2	3	4	5
I like taking food home to share with my family.	1	2	3	4	5
I like vegetables more now that I have worked in the CMS Garden.	1	2	3	4	5
My family likes the vegetables I bring home.	1	2	3	4	5
Social					
I like working with my friends in the garden.	1	2	3	4	5
I like parent volunteer days.	1	2	3	4	5
I feel like a leader when I work in the garden.	1	2	3	4	5
I like working alone in the garden.	1	2	3	4	5
Working in teams in the garden is fun.	1	2	3	4	5
I feel like I get more out of it if I work alone in the garden.	1	2	3	4	5
I enjoy spending time with college students in the garden.	1	2	3	4	5

II. Demographics

We want to learn a little more about you. **Please circle** the most applicable answer to each question.

Race/Ethnicity

African American

Asian/Pacific Islander

White

Hispanic/Latino

Alaskan/Native American

Two or More Races

Age: 11 12 13 14 15

Grade Level: 6th 7th 8th

I identify as: Male Female

How many semesters have you taken an agriculture class? Circle the correct answer.

1 2 3 don't remember

Are/were you ever an FFA member? YES NO

Are/were you ever a member of the Sustainability Garden Corps? YES NO

Does your family have a vegetable garden at home? YES NO

Thank you for completing this survey!

Appendix F – Focus Group Guiding Questions

1. Do you like working in the garden? Why or why not?
2. What is the most important aspect of the garden? Why?
3. What is your favorite part of the garden? Why?
4. What is the biggest impact that the garden has had on your life?
5. Do you feel like working in the garden has changed any of your habits? If so, which ones? Why or Why not?
6. Has working in the garden changed how you make food choices at school?

Appendix G – Focus Group Transcription

A – Moderator

1 – Student 1

2 – Student 2

3 – Student 3

4 – Student 4

A – Ok guys we are going to start the interview. I won't call on you so you don't have to talk if you don't want to, but if you do have an answer feel free to chime in with whatever is on your mind. This is anonymous so no one will know it was you guys so feel free to be honest with me don't feel like you have to make things up to make the garden sound awesome. Do you guys like working in the garden?

All – Yes.

2 – Yea I think it's fun.

A – You think it's fun why do you think it's fun?

2 – Because you get closer to nature

3 – I enjoy putting my hands in dirt.

1 – You get to harvest food and keep the food.

4 – I like working in the garden because you get closer to nature.

A – Ok. And you like to harvest and eat food?

1 – And I think it's fun to see how your food is grown.

2 – Year my mom talks about that a lot. Like farm to table and where your food comes from. You go pick it at a grocery store but really you can grow it on your own or get it at a farm.

A – Any other reasons you guys like working in the garden? The main ones are closer to nature, get to touch dirt, harvest and eat food, learn about food, and the farm to table stuff?

2 – Yea and you can be a leader. I did the summer program with Wick and if I were to be there I would feel like a stage member because I know behind the scenes and were stuff is and that stuff.

A – You feel like you are a part of something.

4 – Yeah like that.

A – Awesome.

A – So for the second one, what is the most important aspect of the garden? What is the most important part of it? What do y'all think is the most important?

4 – I like seeing how your food is grown and also it teaches people responsibility because you have to take care of another living thing but that's not as big as a dog or a cat or a chicken but you actually get to watch it grow and get it what it needs which shows responsibility.

A – Awesome!

4 – Like she said, seeing where your food comes from and getting to eat the food and eat it in the school cafeteria.

A – You like that part?

3 – Yep!

A – How often is it in your cafeteria?

3 – It's like every Friday or every other Friday. And we do a garden bar of the vegetables that we grow.

1 – I kinda wish it was more often. Like every week.

2 – It isn't really a specific day, but usually on a Thursday or Friday.

A – Anything else y'all think is important about the garden?

4 – Nope! Well in my opinion it is important to know that students respect it. Well that they should, not that they always do.

A – Alright so what is your favorite part of the garden? Actually in the garden. You know in the survey it asked about the growing parts or the cooking parts or the social parts. What is y'all's favorite part?

3 – The cooking! Well my favorite part is walking to the garden and getting the vegetables to cook.

2 – Can we count the raised beds?

A – Yes!

2 – I really like the carrot plants and the little tomato plants because you can literally walk out there, pull up a carrot, wash it off and then you eat it.

A – Pretty cool

2 – And the cucumber plants we would harvest them during the summer like every day. The cucumber and the squash and the zucchini we would harvest every day.

3 – I like pulling the weeds in the garden.

A – Oh wow!

2 – That's not fun!

3 – I think it's fun!

2 – Wick would make us sit down and have to pull up these big patches of grass and it was not fun.

4 – I really like watering everything and taking care of everything.

A – What about when you work with other people? Do you like working with other people or do you like doing it on your own?

3 – Yea I do!

1 – Yea! I like working with other people.

2 – I like working with other people if I am in charge.

4 – I like both because sometimes I feel, especially in the garden, if I have friends who I bring to the workday I don't feel like I get much working done. But sometimes during class when we are in groups I like that because I feel like we can get a lot done. So I like groups and working alone.

1 – I agree because sometime I like working with other people but if I feel like I'm going to get more done by myself I just work by myself.

A – Awesome! So for question four, what is the biggest impact that the garden has had on your life? Do you think the garden has changed the way you do something, do you think it makes you care about food more, do you think it makes you want to eat healthier, does it make you want to be a leader, anything like that?

1 – I think the garden has just made me more knowledgeable in growing stuff.

3 – Same here!

4 – I think it is really cool that when I see what we grow and then I see it anywhere else I know the process behind it.

2 – I learned what different foods are! Like this summer I had no idea what kohlrabi was or that it existed. Now I see it in the store and I'm like "Oh! I know what that is!"

A – Anything else that is the biggest impact?

1 – Composting!

2 – And food waste! Now we compost more at school and I compost at home.

A – Do you feel like working in the garden has changed any of your habits? And if so, which ones and why?

1 – I think I am less likely to waste food and if there is something that can be composted I will compost it.

All – Yea!

1 – Before if there was something that could be composted I would just throw it away but now I compost it.

3 – And if you are in lunch in the lunch room there is no way you can throw your food away because they will grab your food and try to compost it. There are like five people around the trashcans trying not to throw away the vegetables.

2 – When I am at my friend's house, I am pretty much the only one who has composting at home, and I see that they have their strawberry tops and their apple cores and I'm shocked because I see that it is wasted.

A – Awesome! Any other habits, y'all think it has made you want to compost and not waste food? What about your eating habits, do you think you eat healthier?

3 – Oh I do eat healthier!

4 – Yea.

1 – Oh I eat healthier too! I feel like I like more vegetables now because before I just wasn't willing to try them but now I'm willing to try them more because I kind of know what they are and how they are grown.

3 – Yea!

2 – And you learn what you don't like. I ate a radish and learned I don't like it, but I do like tomatoes now!

3 – Like usually I wouldn't eat vegetable soup, but I made radish soup.

1 – Yea we made radish soup a while ago in Sustainability Corp and it is really good. I thought it would be disgusting and super spicy but it's not.

A – It sounds kinda weird.

3 – It made me stop eating fast food.

1 – I still like fast food.

A – Stop eating it at all? Like totally?

3 – Well no but not as much.

A – So the last question, which y'all kinda just answered, is 'has working in the garden changed how you make food choices at school?' When you go through the line have you made any changes or the snacks that you bring to school?

2 – My snacks yea.

3 – If you go through the line to get food they make you get vegetables so you have to.

A – Do you eat them now?

2 – Some kids don't, they just waste them.

3 – I eat them.

2 – I bring my lunch every day.

4 – Me too.

1 – I bring my lunch every day but in my lunchbox I always would get some sort of fruit or vegetable and before I wouldn't really eat them I would just throw them away but now I eat try them and see if I like them.

2 – For me it drives me insane when my mom doesn't pack me a fruit. I'm like seriously? I need food. Especially fruit. I would live off fruit if I could.

A – What about leading, do you feel that working in the garden has made you more confident in leading groups of people, or do y'all feel like you do a lot of teamwork stuff in the garden?

3 – Yea I like leading the groups!

4 – I watched our teacher over the summer when she was working here and try to take care of the garden herself and it was REALLY hard, so I would imagine that teamwork would help a lot.

A – So anything else about teamwork in the garden?

2 – Would it count to say that the garden, because of what I’ve done in it, has lead me to do tours and stuff like that?

A – Tours in the garden?

2 – Well tours of the school and I get the opportunity to talk about what I have done in the garden and how it impacts the school.

A – And that is because you worked in the garden?

2 – Yep! I am referring to the summer program a lot. It was fun and I want to do it again!

1 – Yea the summer program was fun I didn’t go that much though.

2 – Were you there when we made ice cream?

1 – Yea I was!!! We would spend about an hour picking vegetables and cleaning them off and it would definitely take way more time if we weren’t all doing it and only one or two people were doing it.

4 – Yea I like seeing how after workdays the amount of work we get done. With just the kids doing stuff in class it would take it would take a week or maybe two what a workday can get done in a few hours.

A – Are work days volunteers?

2 – Yea usually parents and students from UGA. We had athletes come one time too.

A – Is there anything else you guys want me to know about the garden? Something where you are like “man, she really needs to know about this!”

3 – The chickens maybe?

4 – They should have it at more schools! More school gardens.

All – yes!

1 – Some schools have gardens but they are not big enough that they can grow and compost their food and put their veggies in the cafeteria. They have small gardens, but I think everyone needs a big garden.

4 – Especially in areas that need it like in city schools and places like that where kids don't necessarily have access to the healthiest of foods.

3 – Because then they can harvest their own food.

2 – Another thing would be livestock, we have chickens and another middle school has some goats.

1 – The chickens also serve as food because they are chickens but they are also used for eggs, we don't eat the chickens.

3 – We are getting goats! We are getting goats after the break!!

2 – What?! The school is getting goats?! Yes! I have always wanted goats!

3 – Yea so we are going to have goats in the lower field. They are going to build a fence near the fruits.

A – that is really cool!

4 – Chickens teach responsibility. I love the chickens.

1 – But not everyone respects the chickens.

3 – Yea my friend tried to kick a chicken the other day. I have a video of it.

A – That is not very nice. Sounds like they need to be respectful of the chickens. Thank you guys for being a part of my focus group, have a great day!

Appendix H – Transcript Codes

Cultivation - 25

1. Closer to nature – 2 mentions
2. Enjoy putting my hands in dirt
3. Harvest food – 6 mentions
4. Fun to see how your food is grown – 4 mentions
5. Grow it (food) on your own
6. Walking in the garden
7. Pulling weeds
8. Watering everything
9. Taking care of everything
10. More knowledgeable in growing stuff
11. Composting at school – 4 mentions
12. Composting at home – 2 mentions

Culinary - 20

1. Keep the food
2. Farm to table
3. Where you food comes from – 3 mentions
4. Getting to eat the food in the school cafeteria (garden bar) – 3 mentions
5. Getting to eat the food you grow – 2 mentions

6. Cooking
7. Learned what different foods are
8. Eat healthier – 2 mentions
9. I like vegetables now because... I kind of know what they are and how they are grown
10. Made radish soup in Sustainability Corp – 2 mentions
11. Eat less fast food
12. Now I try them and see if I like them
13. I eat the vegetables in the cafeteria now

Social - 20

1. Can be a leader – 2 mentions
2. Feel like you are part of something
3. Teaches people responsibility - 2
4. Students should respect the garden
5. I like working with other people – 5 mentions
6. During class when we are in groups I like that because I feel like we can get a lot done
7. I like working alone – 2 mentions
8. Teamwork – 3 mentions
9. Lead tours of the school for the community because of my involvement in school garden
– 2 mentions
10. Parents and students from UGA come to workdays

Feelings about School Gardens

1. More school gardens – 3 mentions
2. I think everyone needs a big garden
3. Especially in areas that need it like in city schools and places like that where kids don't necessarily have access to the healthiest of foods

Appendix I – School District Research Proposal

Ashley DeAnn Collins

University of Georgia
Graduate Teaching Assistant and Master of Agricultural and Environmental Education student
Department of Agricultural Leadership, Education, and Communication
Address: 400 River Road
Four Towers Building
University of Georgia
Athens, GA 30602
Phone number: 404-313-9716
Email: ash2009@uga.edu

Advisor: Dr. Nick Fuhrman
Associate Professor
Department of Agricultural Leadership, Education, and Communication
Phone: (352) 226-1199
Email: fuhrman@uga.edu

Title: School Garden Impact on Urban Youth

Approximate beginning: Immediately after project acceptance

Approximate ending: Three weeks after start date

Target School: Clarke Middle School

Purpose of the Project

To investigate the various aspects of school garden programs (social, culinary, and cultivation) impact on a middle school youth's food environment.

Target Population (school, grade levels, subgroup, etc.)

The target population for this study would be the students enrolled in the agriscience program at Clarke Middle School in sixth, seventh, and eighth grades.

Timeline for Major Activities (include starting and ending dates for research study)

The following timeline was developed after considering the 2014-2015 CCSD academic calendar. Immediately after project acceptance, a consent form will be sent to all parents of students who are enrolled in the agriscience program at Clarke Middle School to introduce the study two weeks before data collection. A week before data collection another consent form will be sent to home with students to the parents to increase participation numbers. A week later a fifteen minute survey will be conducted in every agriscience course over a two day period for students who returned their consent forms and signed an assent form. Approximately 2-3 days later, qualitative interviews will be conducted with students at an after school FFA meeting that will take no more than thirty minutes in a group setting. These interviews (with no more than five students) will be conducted face to face. (Please see attachments for examples of consent forms and instruments used)

Research Question

What aspect of school garden programs impact urban middle school youth perspectives on food environment?

Research Hypothesis

The researcher hypothesizes that urban middle school youth are impacted by the social aspect of school garden programs when it comes to their food environment.

Project Design (including amount of testing/student-contact time, if any) Activities must be nonintrusive to the regularly scheduled instructional day.

PART ONE

Part one of this study will be done using a paper survey which will take 10 – 15 minutes to complete. This survey will be conducted during the first fifteen minutes of the agriscience connections course at Clarke Middle School over the course of two days. Only students who returned completed parent permission and assent forms will be allowed to participate in the survey. There will be no make-up days for those who miss the survey days in class.

The questions on the quantitative survey will ask the students to respond to statements by sharing levels of agreement and how true particular qualities are for them when relating to social, cultivation, and culinary aspects of the school garden program. They will also be asked to share some demographic information. All data from this survey will be completely anonymous.

PART TWO

Part two of this study will involve voluntary interviews with up to five students who agree to participate. Students will be recruited at an after school FFA meeting at Clarke Middle School, so no class time will be impacted by conduction of interviews. These interviews will last about 30 minutes and will be conducted in a group setting. All interviews will be audio recorded and transcribed verbatim. No names will be associated with responses.

How Project Relates to Student Academic Achievement

While many studies have revealed that school gardens are beneficial to academic achievement of students, few studies have been conducted that focus on the various aspects of school garden programs and how they impact life choices of a student. Anderson and Kim (2009) addressed the desire of urban students in agriculture programs to learn leadership skills and real-world application through their involvement in FFA and gardens. Another study revealed that students involved in school garden programs score “significantly higher” on science achievement exams than students who were not involved in their school garden (Klemmer, Waliczek, and Zajicek; 2005).

How Project Relates to District or Target School’s School Improvement Plan

School gardens can be used in many different subjects, and can be utilized towards areas of improvement for students. The Clarke Middle School 2012-13 Improvement Plan would like to improve the percentage of students who meet or exceed expectations on the science portion of the CRCT from 72% to 78%, as stated in the Science Growth Area of the Clarke Middle School Improvement Plan (p. 10). Gardens provide many opportunities for science application,

especially during biology and life science, and the agriscience curriculum focuses on the growth and needs of plants. The “Establish positive school cultures through engaging classroom environments that support student's emotional and social needs” area of the Improvement Plan addressed the need for a more comfortable environment for students through school-wide enrichment programs. Having a garden in a school encourages teamwork and collaboration among students, which in turn makes parents more comfortable to participate in their child’s school (Boyer et al., 2011).

How project is aligned to the Georgia Performance Standards

Georgia Performance Standards for Agriscience programs at the middle school level focus on many different agricultural topics, including plant science. Gardens allow for a hands-on take on this topic by allowing students to plant, nurture, and grow plants and see the complete life cycle. Gardens also allow students to understand the different parts of a plant, different seed types and seed dispersion techniques, and propagation techniques.

How Project Will Benefit the Clarke County School District

Every school in Athens-Clarke County has some form of a school garden program, from an in-ground garden plot to a container garden. Little research has been conducted to determine what aspect of school garden programs actually impacts students working in the school garden, which means no one knows when and how students should be involved in gardens. Knowing what the most important aspect of a school garden program is to students will assist in the incorporation of the garden into curriculum and ensure students are participating in the most valuable aspect of the garden program. This study targets a school that has been identified as a

leader in utilizing their school garden and currently addresses social, culinary, and cultivation aspects of a garden. By understanding what aspect connects with Clarke Middle School students the most through this study, other CCSD schools and their students could benefit from knowledge.

Assurance Statement

I, *Ashley DeAnn Collins*, under the supervision of Dr. Nick Fuhrman, assure that all previous research carried out in Clarke County School District will culminate with the required reports.

Signed: _____ Date: _____

Ashley DeAnn Collins

Signed: _____ Date: _____

Dr. Nick Fuhrman

Statement of Commitment

I, *Ashley DeAnn Collins*, under the supervision of Dr. Nick Fuhrman, commit to present an oral report on the findings of the study School Garden Impact on Urban Youth's Food Environment to Clarke Middle School teachers if there are interested faculty or staff. I agree to give this presentation within 90 days of completing my research project at a time that is convenient for all interested parties. This presentation will be an informal discussion of the results of the study, to include specific implications for classroom and resource teachers.

Signed: _____ Date: _____

Ashley DeAnn Collins

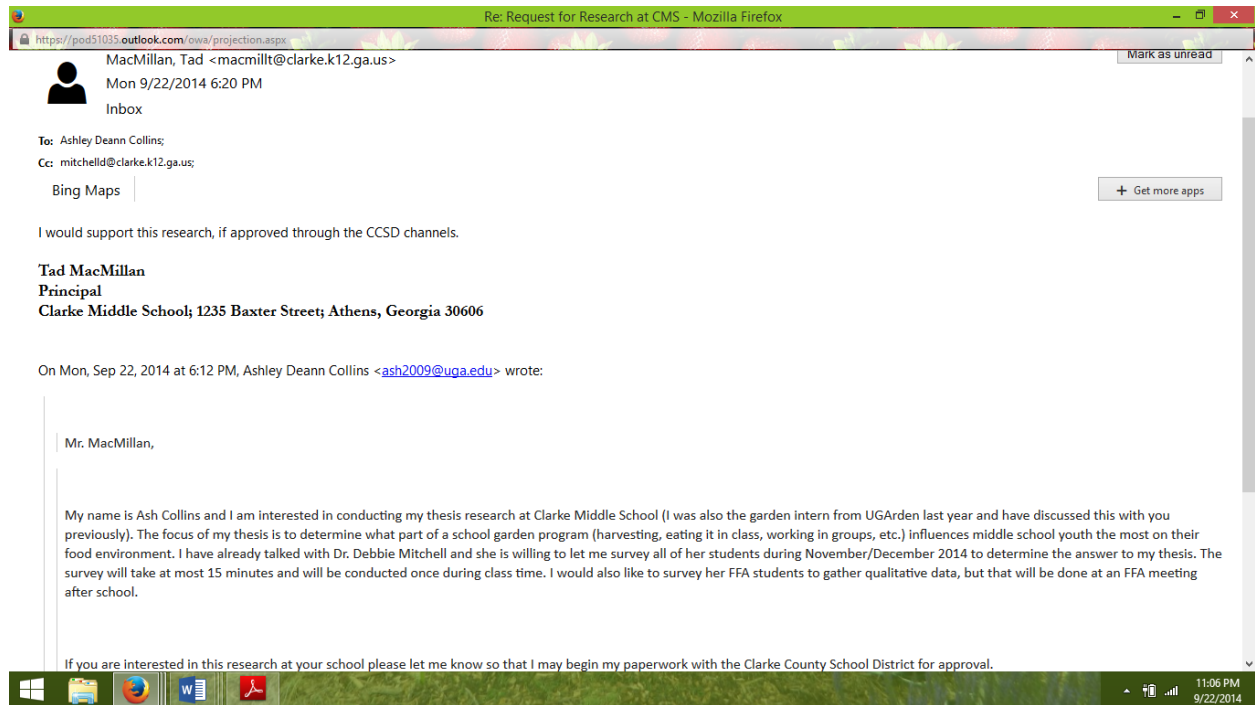
Signed: _____ Date: _____

Dr. Nick Fuhrman

References

- Anderson, J. & Kim, E. (2009). Youth leadership development: Perceptions and preferences of urban students enrolled in a comprehensive agriculture program. *Journal of Agricultural Education*, 50 (1), 8-20.
- Boyer, R., McFarland, A., Zajicek, J., & Waliczek, T. (2011). Growing minds: Gardening and parent involvement in elementary schools. *Journal of Therapeutic Horticulture*, 21 (2), 8-26.
- Klemmer, C., Waliczek, T., & Zajicek, J. (2005). Growing minds: The effect of a school gardening program on the science achievement of elementary students. *HortTechnology*, 15 (3), 448-452.

Appendix J – Principal Commitment



Appendix K – School District and IRB Research Approval

