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The Integration of School Garden Programs into Educational Curriculum

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THE INTEGRATION OF SCHOOL GARDEN PROGRAMS INTO EDUCATIONAL
CURRICULUM

By

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To my parents, who taught me to question the status quo and inspired me to search for the truth myself.

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Thank you also to the honors council members, who have worked so hard to create this new honors program. This honors program, both the class and project, has greatly influenced me and allowed me to connect with peers who shared my desire to think deeply.

PREFACE

Education is a reflection of culture. Children are educated based on the values and beliefs of the current society, and therefore, education can be one of the best gauges of what we as a society feel is important. All of us, educators, parents, administrators, and professors, as well as those in business, science, medicine, music, and art, need to look critically at today's educational system not as a set methodology of pedagogical skills, but as a picture of the culture in which we live. What does this culture value? How does our society function? Our life in America is greatly influenced by the many commodities we produce and consume. In a society that greatly values these products and the efficient production of them, has our education system begun to mimic the assembly line that we so readily use? And if so, is this the best way to educate? Is the goal of education efficiency or development of something more?

As evidenced from my many questions, I wanted to explore a topic that helped students to develop in areas that our current fast-paced society sometimes does not allow. I have grown up helping my mom with her summer vegetable garden and remembered the joy of seeing large, delicious vegetables grow from a small seed in the ground. Along with my own experience, I was also drawn to the philosophical way that gardening connects the gardener with the basics of life. In our American world where we can get entertainment at the press of a remote control button and make a meal in minutes in the microwave, gardening can remind us that the best things sometimes do not happen instantly, but, like the plants, grow slowly through nurture and care.

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ABSTRACT

School gardens have many benefits for students which include helping students make nutritious choices, encouraging students to be environmentally conscious, and providing experiential learning. School gardens have great potential to be an effective learning tool if incorporated into the classroom. The purpose of this project is to evaluate how gardening is being integrated into classroom curriculum in several schools in the state of Illinois and what factors have led to this integration. Educational professionals from seven different sites were interviewed to collect qualitative data about current integration of gardening into school curriculum. The results from the interviews confirm previous research on the benefits of gardening and give new insights about current and future integration of the garden into the classroom.

Keywords: School Gardening; Integrated Curriculum; Horticulture; Teaching Methods; Teacher Education; Interdisciplinary Approach; Environmental Education

CHAPTER ONE: THE PROBLEM

The benefits of school gardening to students have been researched and include improving nutrition, aiding environmental awareness, stimulating critical thinking, and helping with the holistic development of students. Along with the many benefits gardening can bring to students, the activity itself can help students better understand the process of learning. When writing about this aspect of school gardening, Subramaniam (2002) speaks of how garden-based learning helps students improve contextual, integrated learning. Gardening benefits the students by inspiring new ideas of learning and allowing them to solve new problems.

Elementary schools across the country are beginning to create school gardens. In an evaluative study on current research in school gardening, Blair (2009) states “school gardening has become a national movement” (p. 15). However, the presence of school gardens does not necessarily mean that the gardens are being used as effective educational tools. The purpose of this project is to research how gardening is being integrated into classroom curriculum in several schools in the state of Illinois and what factors led to this integration.

Questions for research were:

1. Is there a connection between a school’s mission statement and the school’s use of gardening in the classroom?
2. Did past experience with gardening influence whether gardening leaders integrate gardening into the school’s curriculum?
3. From the opinion of current school gardening leaders, would Illinois encourage schools to integrate a gardening program into the curriculum?

4. Did teacher in-services about gardening affect whether teachers used the gardening in their classrooms?
5. Did current research about the benefits of gardening reflect expressed benefits from current professionals working in school gardening programs?

This project had both delimitations and limitations. In terms of delimitations, this project did not examine how to create a school garden program, but rather worked with schools that already had garden programs. Neither did this project examine the best way to integrate gardening into the classroom, but rather was an evaluative study on the current integration of gardening into the classroom in the select Illinois schools.

One limitation was that the study consisted of a sample of interviewees from seven sites, while there are thousands of educators across the state of Illinois. The statements may not represent the whole population. A second limitation was that all those who were interviewed were from Illinois; thus, the results may not be generalizable to all school gardening programs in Illinois or in other states. The third limitation was that the interviewees were all leaders in their school gardens, so the opinions of teachers not a part of the school gardening program were not included. A last limitation was that the interviewer took the notes during the interview, which could possibly have affected the accuracy of the interviewees' statements.

Two terms that need clarification in this paper are "garden program" and "sustainability." The term "garden program" was used in its broadest context, and ranged from schools that simply had a garden that was being tended by staff or teachers to schools that were actively integrating the garden into curriculum. "Sustainability" refers to the effort to teach students how to live with the least amount of harm to the earth.

Though schools may have gardens, they may not be using them to their full potential as an educational resource. Gardening has many proven benefits and incorporating it into the classroom can help bring all these benefits to the students. This study will evaluate seven Illinois schools that are integrating gardening into the curriculum and look at some of the determining factors that lead to this integration.

CHAPTER TWO: REVIEW OF LITERATURE

The Need for Gardens

Children today are spending more time indoors and less time outside than ever before. New technologies, such as computers, television, and video games, have allowed children stimulation that was once experienced outdoors. However, researchers, authors, parents, and teachers are questioning the effects of this new indoor childhood on the current generation. Louv (2008) defines modern children's lack of exposure to the outdoors as "nature-deficit disorder" and describes the many problems this disorder can have including lack of attention, diminished use of the senses, and even physical or emotional illness. As a response to the nature-deficient disorder of today's children, some educators have tried to create ways to expose children to nature. Though there are various avenues that can open children to the outdoors, time constraints and availability can often pose multiple problems. Many teachers have discovered that one of the most convenient ways to expose students to the outdoors is through a school garden. School gardens not only expose children to the outdoors, but also aid nutrition campaigns, increase environmental awareness, challenge students to think critically, and help students to develop holistically. This chapter discusses current research about the benefits of gardening and addresses the importance of gardening in the classroom.

Researched Benefits of Gardening

Nutrition

School gardens have helped improve nutrition in the schools. In a study done about the effects of a school garden on students' consumption of fruit and vegetables,

Parmer, Salsibury-Glennon, Shannon, and Struempler (2009) had encouraging results. The study evaluated six first grade classrooms, with one of those classrooms integrating gardening into the nutrition curriculum. Using a survey, preference questionnaire, and lunchroom observations, researchers observed that students in the classroom which incorporated gardening had the highest preference for fruits and vegetables and ate more of them during lunch.

Not only do gardens improve nutrition, but gardening can also change the way students view food. When explaining how gardening can help students better understand how food is grown and used, Blair (2009) quotes Thorp and Thorp (2001) writing:

Gardening changes the status of food for all involved. When one gardens, food can no longer be viewed as a mere commodity for consumption; we are brought into the ritual of communal goodness that is found at the intersection of people and plants. Food that we grow with our own hands becomes a portal for personal transformation. (p. 357)

As students learn the joys of gardening, they no longer see food as a commodity, but rather value the plants they have grown and appreciate the growing process.

Environmental Awareness

Gardens have increased environmental awareness because they give students the opportunity to experience nature. When describing how environmental attitudes are formed, Pe'er, Goldman, and Yavetz (2007) emphasize the importance of connecting with nature at an affective level. The authors write that the affective part of environmental education is “concerned with the attitudes and values necessary to

motivate the transformation of knowledge into responsible environmental behavior” (p. 46).

Gardens help increase environmental awareness by allowing students to form environmental attitudes through hands-on experience. When speaking of the philosophy behind garden-based learning, Aarit (2002) speaks how gardening guides children to personal discovery in a natural environment and explains how this process allows students to internalize important ecological ideas.

Researchers have specifically studied the effects of gardening on environmental awareness. Brynjegard (2001) writes of three elementary schools in California that have school gardens and evaluates the environmental awareness of the students of these schools. In the first school, the author tells that the children enjoyed the garden as a place to relate to nature and how children were even able to name native plant species. The second school had planter boxes that gave students a sense of ownership and commitment to the environment. The third school had a part-time garden coordinator who helped create an extensive school garden and facilitated gardening classes. This part-time garden coordinator at the third school stated that the garden promoted maturity in environmental thinking among the students.

Morgan, Hamilton, Bentley, and Myrie (2009) speak of school gardening programs helping students become more environmentally aware. While studying a garden program in the inner city, where children have fewer experiences with nature, Morgan et al (2009) recognized that the positive experiences in the garden program promoted more awareness of the outdoors and encouraged positive attitudes towards the environment.

Critical Thinking

Along with helping students become more environmentally aware, gardening has increased academic and interdisciplinary skills. In their research about the Brooklyn Botanic Garden Project Green Reach (PGR), Morgan et al. (2009) observed that students used the garden in many different academic subjects at the same time. When describing the interdisciplinary nature of the garden, one student said

It forced us to look outside the box when we were thinking about plants. We didn't just grow them and bring home vegetables and ... things of that nature. We drew pictures. We spoke of our experiences while we were there. We made instruments. (p. 43)

Their study emphasized that gardening can be an effective teaching tool in many different areas of academia, such as science, art, and even home economics.

Blair (2009) discovered that gardening enhances not only interdisciplinary skills, but also develops higher-level cognitive thinking skills by reviewing current research in school gardening. In one research study, 175 elementary students were interviewed after a four-hour hands-on nature program, and their responses were classified in Bloom's taxonomy. The children's responses showed that 87% used application vocabulary, 19 % used analysis vocabulary, and 26 % were able to use words that showed synthesis and analysis (Waliczek, Loga, & Zajicek, 2003, as cited by Blair, 2009).

In another study, Mabie and Baker (1996) discovered that after an extended school garden project in a Los Angeles middle school, which included three classroom projects, including seed starting, chick rearing, and bread baking, students improved in critical thinking skills such as ordering, comparing, and communicating (as cited by

Blair, 2009). Gardening can help students develop important skills that will aid their learning in other academic areas.

Holistic Development

Gardening encourages students to develop in areas that traditional academics may ignore, such as self-esteem and social skills. In the Project Green Ranch garden program, Morgan et al. (2009) tell how this program teaches students that growing plants and friendships have similarities. Students in the program are able to work with partners, discuss their ideas about the garden, and speak in front of their peers.

Other researchers have come to similar conclusions about how gardening helps develop the whole child. During their studies of the impact of a master's gardening program in San Antonio Independent School District, Alexander, North, and Hendren (1995) identified that gardening teaches children how to respect and care for natural things, to develop patience for delayed gratification, and to cooperate with others. Alexander, North, and Hendren (1995) observed that this master's gardening program has strengthened the connection between home and school. Parents are encouraged to come in and volunteer, and students are eager to talk about gardening activities at home. Gardening gives students a sense of accomplishment that they want to share with others.

Other studies have confirmed that gardens help students develop in ways beyond the academic curriculum. In their study of how outdoor activities involving nature can benefit students, Palmberg and Kuru (2000) discovered that students who had more outdoor experience were more willing to try new activities and work as a team. Students

who did not have previous outdoor experience were more apprehensive to try new activities and less enthusiastic about cooperating.

Importance of Gardening in the Classroom

Gardens help children learn through experience. Montessori, the creator of the Montessori philosophy of education, was one of the first educators to realize the importance of experiential learning. Montessori integrated gardening into her school curriculum and discovered that gardens allowed children to contemplate and become excited learners (Alexander, North, & Hendren, 1995). Another educational reformer, Dewey, was also a proponent of gardens. He believed that gardens connected classroom learning with the natural environment of the students and helped integrate knowledge with practice (Kohlstedt, 2008).

Along with allowing students to learn through hands-on activities, gardens help students connect to nature in their local environment. In a study evaluating the importance of localizing environmental education, Fisman (2005) learned that students' understanding of nature greatly increased when they completed an activity that helped them see the nature in the local environment. This research was guided by the belief that sustained exposure to nature creates a lasting connection. A school garden gives students the opportunity to experience nature in a local environment and gives them sustained exposure to the outdoors.

Integrating Gardening into the Curriculum

The comprehensive nature of gardening allows it to be integrated into almost any subject. Students can use math while measuring plants, science while studying growth, art while they draw what they see or experience, and reading as they learn about the different processes of gardening. When speaking about the integration of gardening, Subramaniam (2002) declares that gardening is a pivotal platform for integrated curriculum because it is interactive. Students construct knowledge as they have hands-on interaction in the garden, and this applied way of learning can help solidify knowledge in other areas (Drake, 1998, as cited by Subramaniam, 2002).

In a recent study, Blair (2009) examined whether the benefits of integrating school gardens into the curriculum have been proven by measurable results. The study reviewed multiple current journal articles about gardening education and identified that nine out of the twelve quantitative studies agreed that gardening measurably improved behavioral and higher science achievement. When discussing the direction of further studies, Blair states:

Additional studies are necessary on how educators can best remove barriers to implementing and keeping school gardens running. Studies have not addressed school-garden continuity or failure, but they have addressed the lack of teacher preparation for using gardens in instruction. (p. 35)

More research is needed about the reasons for school gardening success and failure. My research project addresses the concern of how to implement effective school gardens in the state of Illinois, specifically focusing on integrating the garden into the

classroom. Interview questions inquire as to how teachers are integrating the gardening into their classroom and what factors lead to successful integration.

CHAPTER THREE: METHODOLOGY

The purpose of this project is to evaluate how gardening is being integrated into classroom curriculum in several schools in the state of Illinois and the factors that led to this integration. The research design of this project was qualitative research through the interview method. Interviewing is a philosophy of learning as the interviewer studies those that are interviewed and the responses they give (“What Is Qualitative Interviewing?,” n.d.). Interviews can either be structured or unstructured. Structured interviews have a list of questions, and interviewees’ responses are limited to answering the specified questions. On the other hand, in unstructured interviews, the interviewer can deviate from prepared questions as the conversation turns to related topics. This project mainly used a structured interview process; however, extra information was obtained through a few conversational comments between prepared questions.

When conducting the interview, interviewers must examine both the content and the process of the interview. The content is what is actually said, while the process is how the interviewee acted during the interview. Process clues can be elements such as body language, intonation, volume, sequencing, and even the location of the interview (Suler, n.d.). During this project, both content and process clues were taken into consideration, although most of the data was from the content of the interviews. Interviews give new insights, widen previous perspectives, and can be validated by other interviews (“What is Qualitative Interviewing?,”n.d.).

Questions for research were:

1. Is there a connection between a school’s mission statement and the school’s use of gardening in the classroom?

2. Did past experience with gardening influence whether gardening leaders integrate gardening into the school's curriculum?
3. From the opinion of current school gardening leaders, would Illinois encourage schools to integrate a gardening program into the curriculum?
4. Did teacher in-services about gardening affect whether teachers used the gardening in their classrooms?
5. Did current research about the benefits of gardening reflect expressed benefits from current professionals working in school gardening programs?

Subjects were selected for their profession in education and their participation in school gardening programs as well as their willingness to participate in this study. The data came from the interviewee's responses to interview questions. The interviewee's responses were either written down as they verbally responded or given through written form. Assumptions for the interview were that the interviewees would understand the interview questions and that the interviewees would answer the questions honestly.

One limitation was that the study consisted of a sample of interviewees from seven sites, while there are thousands of educators across the state of Illinois. The statements may not represent the whole population. A second limitation was that all those who were interviewed were from Illinois, which may not be able to be generalized to all school gardening programs in Illinois or other states. The third limitation was that the interviewees were all leaders in their school gardens, so the opinions of teachers not a part of the school gardening program were not included. The final limitation was that the interviewer took the notes during the interview, which could possibly have affected the accuracy of the interviewees' statements.

Before beginning the interviews, an application was submitted to the Internal Review Board (IRB) of Olivet Nazarene University. This application stated the purpose for the research, how the research data would be collected, and how the privacy of interviewees would be protected. IRB permission for this study was granted in May, 2010.

To identify sites and interviewees, three sources were used. The first source was the Internet to search for elementary schools in Illinois that had garden programs. Once a site was selected, contact was made to ask if an administrator or teacher would be willing to be interviewed. The second source to contact interviewees was through personal contact and through contacts from professors or from my own teaching experiences. The third source was to ask interviewees if they knew of any contacts who would be available to be interviewed.

The questions for the interview were based on previous research about integrating gardening into the curriculum. Some questions were formed to build on previous questions, while others were independent of each other. Questions were created with terms that professional gardening educators could clearly understand. The interview questions are located in Appendix B.

During the interview, the priority was having the interviewees answer the prepared questions; however, other spontaneous questions were asked to specify a topic or expand an idea. Therefore, the interview was mainly a structured interview.

After the interviews were complete, notes and data were analyzed. First quantitative evidence, such as how many schools integrated gardening, was assessed. This information was put into charts to aid understanding of the qualitative responses in

the written results. After this data was established, notes were compiled so each question had responses from all interviewees. This made it easier to analyze the notes and decide how the responses related and applied to one another.

CHAPTER FOUR: RESULTS

Data was collected through the qualitative method of interview. All the interviewees had worked or were working in a school with a garden program as listed in Table 4.1. The term “garden program” was used in its broadest context, and ranged from schools that simply had a garden that was being tended by staff or teachers to schools that were actively integrating the garden into the curriculum. Interviews took place either on site, with the phone, or through e-mail.

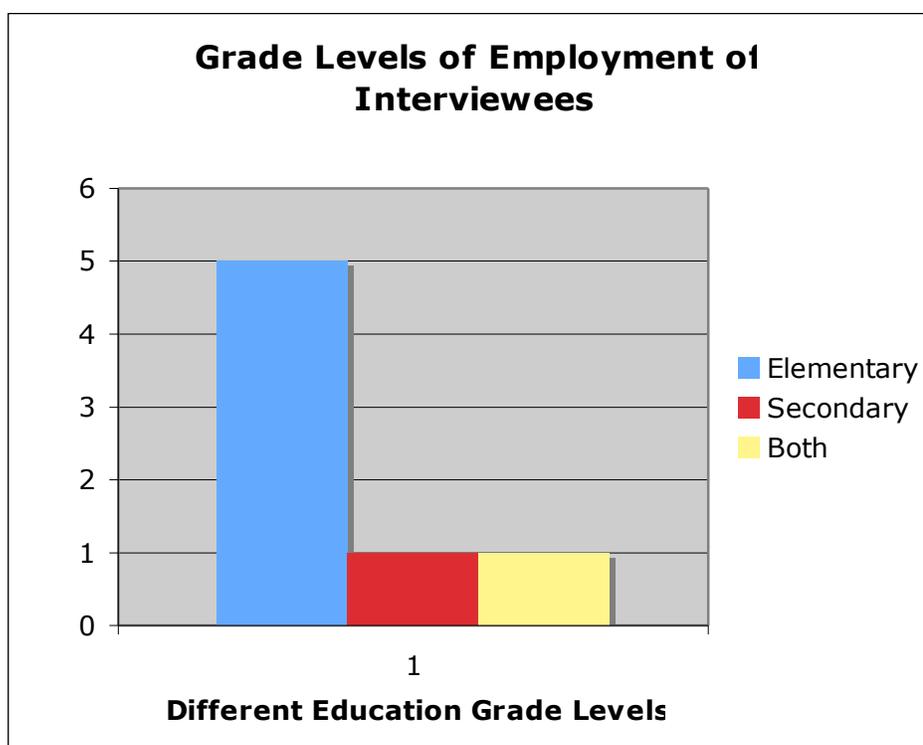
Table 4.1 Interviewee Background

	Experience with a school garden program
Site #1	Teacher who is currently on the elementary public school “Growing Members Committee” which works on outdoor planting projects for the school
Site #2	Horticulture public high school teacher who supervises the school greenhouse and all gardening at the school
Site #3	Elementary teacher who helped to start current butterfly garden for public school
Site #4	Administrator of a charter elementary school with a great emphasis on global awareness, sustainability, and gardening
Site #5	Environmental educator who currently works with University of Illinois Extension Master Gardener Program (which participates in school gardens)
Site #6	Elementary teacher who was previously on a public school committee that planned outdoor planting projects
Site #7	Environmental educator at a charter school with an emphasis on sustainability and outdoor education

*For specific names of sites, please see Appendix C

Interviewees work with students from a variety of ages according to Figure 4.1. At site one, three, four, and six, all interviewees work as teachers or administrators of schools at the elementary level. Site two interviewee works with high school students, while Site five interviewee works with training gardening mentors who can assist classroom teachers in creating a school garden.

Figure 4.1 Grade Levels of Employment of Interviewees



Current Integration of Gardens into Curriculum

The amount that the school garden was integrated into the curriculum varied depending on the specifics of the school garden program. At site one, the garden program consisted of planting three new trees and creating two raised beds. The “Growing Members Committee,” a committee of both current staff and retired teachers of the school, worked together on the project. To help plant the trees and to create the raised

beds, the school hosted a “Community Day” in April 2010, at which time 150 people from the community came to help. The money for the raised beds was given through a grant from the University of Illinois and from other donors. Future plans included planting vegetables and pumpkins in the raised beds and putting in a pond. The “Growing Members Committee” did not have specific plans on how the raised beds would be integrated into the classroom, but rather simply had the desire to give teachers a resource that they could incorporate into their classroom.

Site two was a high school where gardening occurred in the school greenhouse and with outdoor plants on the school premises. The horticulture teacher supervised the gardening, and the plants were mainly used for the horticulture and greenhouse class. In the horticulture class, the teacher integrated the greenhouse into the curriculum by having students plant a seed and record the stages of its growth. Future plans are a vegetable garden, which the horticulture teacher hopes can be done as a project with Future Farmers of America, also known as FFA.

Site three was an elementary school that had a butterfly garden. The garden was divided into four sections, and each grade chose which plants would be planted in each part. Beyond planning and planting the garden, teachers have used the garden as a place for the students to read, but no official curriculum has been developed to integrate the garden into the curriculum. A local gardening club donated the money for the gardening supplies and books about plants that attract butterflies.

Site four was a charter elementary school that had a school garden which was an integral part of the school since it opened two years ago. When designing the school, which promotes global citizenship and sustainability, the garden was a significant part of

the extensive design project. The design team created the garden program but are still tweaking and revising the program as they gain experience and perspective in time. Right now, the garden is incorporated into the daily 40-minute sustainability wellness class, as well as used by teachers in unit lessons.

Site five was not one location, but rather a gardening program through the University of Illinois horticulture extension called the “Master Gardener.” Master gardeners are qualified gardeners who are able to help others learn the art of gardening and planting. To become a master gardener, volunteers must go through 60 hours of initial training and 10 hours of annual instruction. The Master Garden program works with schools to pair a master gardener with a teacher who wants to create a school garden. The master gardener is able to give advice and support for teachers. Master gardeners do not have a specific program to help integrate gardening into the classroom, but can be a valuable resource for teachers who are trying to integrate the garden into the curriculum.

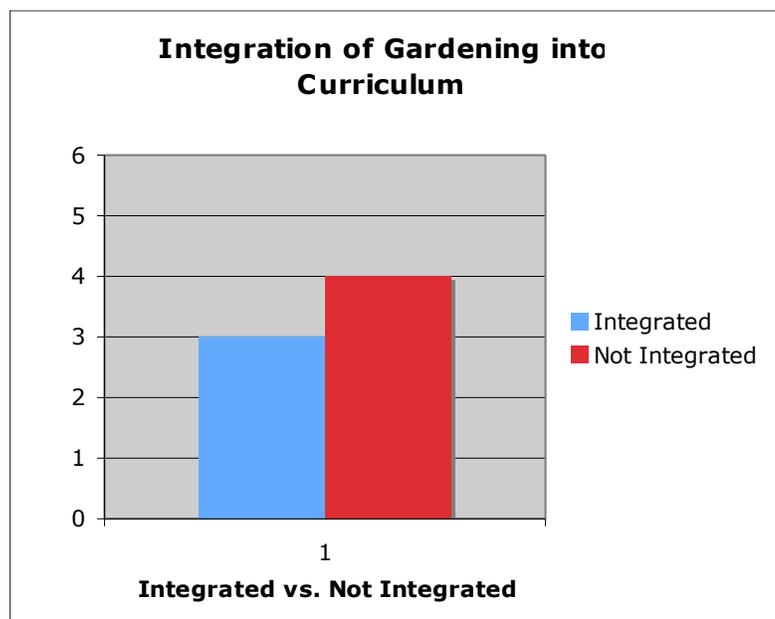
Site six was an elementary school that previously had a committee that helped with outdoor planting projects. In its first year, the committee organized for each grade to plant a tree on school premises and also arranged for students to plant 500 bulbs, which was done during recess hours. In the second year, one of the first grade classes planted 300 donated bulbs on a Saturday with the help of family and community members. Though an official garden program was not created, students did get a chance to plant something on their school grounds.

Site seven was a charter school that was built with a mission for sustainability and outdoor education. Each class has its own classroom garden, which is located behind

each classroom. Teachers plan how they will use their garden with the help of an environmental educator. This environmental educator also helps teachers integrate the garden into their curriculum. Some teachers incorporate the garden into their problem-based learning units, where students plan, design, and implement the whole garden. Other teachers use the garden to enforce certain curriculum units and lessons as they see fit. Most teachers will plant native plants, but some grow vegetables or have gardens with themes that match aspects of curriculum, such as a Native American garden or Colonial herb garden. Along with gardening, the school partners with a local learning farm to educate students about sustainability.

Figure 4.2 summarizes the findings about the number of the interviewed schools which integrated gardening into the curriculum.

Figure 4.2 Integration of Gardening into the Curriculum



Integration Obstacles

Various obstacles can cause teachers not to integrate the garden into the classroom curriculum as listed in Table 4.2. From the sites that did not academically incorporate the garden, site one, three, five, and six, interviewees gave explanations for the lack of integration. One reason was that most flowers bloom and vegetables grow in the summertime, when students are out of session. Another reason was that teachers had other interests and gardening does not take a priority in their classroom curriculum. Also, some teachers were not comfortable with the garden and did not have enough experience with gardening. Teachers may have an interest in bringing gardening into the classroom, but may be unsure how to start incorporating it into their curriculum.

Table 4.2 Obstacles to Integrating Gardening into the Curriculum

Obstacles to Integrating Gardening into the Curriculum
<ul style="list-style-type: none"> • Flowers bloom and vegetables in the summertime while school is out of session • Teachers have other interests • Teachers are not comfortable with the garden • Teachers are unsure how to incorporate the garden into the curriculum

Among the three sites that did integrate gardening into the classroom, the interviewee from site four named obstacles they faced when they were integrating the garden into the classroom. One obstacle was managing large numbers of younger students while in the garden. Another obstacle was how groups of students participated in

the gardening activities. For example, the most popular gardening task is watering; however, not everyone can water all the time because too much water will kill the plants.

Garden Experience

Research question two asked about teachers' previous gardening experience because I thought that if teachers had previous gardening experience they would be more likely to integrate it into their classroom. All interviewed teachers had some type of gardening experience, but there was a similar past experience between two of the educators that incorporated gardens. The two interviewees who integrate gardening into the classroom both had previous experiences of living on a farm, while none of the other interviewees shared this same experience.

The two teachers who integrated gardening into the curriculum were from sites two and four. The high school teacher at site two mentioned her gardening experiences at the University of Illinois, her life on a farm, and her previous gardening job. The administrator at site four spoke of growing up on a rural dairy farm and had interests in organic foods.

The other teachers had past gardening experience, but did not have farm living in their past. The elementary teacher at site one told that the current garden was the third garden with which the teacher had participated. The first garden this teacher was a part of was a large vegetable garden that was located next to a nursing home. Students were bused to the garden site once a week, and the students grew vegetables for the nursing home. This first garden was a great community builder, and students even had contests

to determine who could grow the most unique vegetables. The second garden that this teacher participated in was a prairie garden with natural grasses.

The teacher at site three expressed her initial dislike of gardening because of memories of helping grandma with a very large garden during childhood. This previous dislike has changed as this teacher has explored gardening during adulthood and now has a vegetable and flower garden at home.

The environmental educator at site five told about visiting the Lincoln Park Conservatory during childhood, visiting the greenhouse with mom, taking a high school horticulture class, and working in a greenhouse. The teacher at site six mentioned a childhood home that was next to a large university that had a big garden area and greenhouse where she would spend time.

Teacher In-Services

Research question four inquired if teacher in-services about gardening influenced whether teachers integrated gardening into their curriculum. However, none of the sites where teachers were interviewed currently had any teacher in-services about gardening. At site seven, which was the sustainability charter school, the educator mentioned that some teachers did attend gardening conferences on their own. Site one mentioned that the school hoped to work with the University of Illinois extension program in the future to possibly create an in-service. Ironically, when I interviewed one of the environmental educators from the University of Illinois extension program about teacher in-services, the educator said there was nothing in place, but thought it was a great idea. In fact, the

interview question actually inspired this educator to think of more ideas on how the extension program could be a part of teacher in-services.

Benefits of School Garden

Gardening has many researched benefits as explained in the Review of Literature, but it was interesting to discover how the interviewees, leaders who were actively participating in school garden projects, would respond when asked about the benefits of school gardens as indicated in Table 4.3.

The teacher at site one spoke of how gardening helps develop critical thinking, problem solving, and logic skills. This teacher also mentioned that gardening employs a different set of skills than other academic skills, and requires students to think ahead and work as a team. The teacher at site two explained that gardening allows students to learn how to nurture and care for something. Even troubled students seem to respond to gardening, and it can be therapeutic for these students.

The teacher at site three responded that gardening gives students a respect for nature, and stated, “if they start at a young age, maybe you could spark something in a child,” (personal communication, December 7, 2010). The administrator at site four told about how gardening allows students to make connections between what they are eating and what they plant, which can have nutritional benefits. Also, gardening helps students enjoy the outdoors by allowing them to get dirty and watch something grow.

At site five, the environmental educator spoke of how school gardens give students exposure to plants as well as a connection between what they eat and where it comes from. Local grown food tastes better, and when students learn this through the

garden program, they will be more willing to eat healthy foods instead of processed foods. Also, this educator mentioned that gardening and plants create a sense of well-being and give a positive atmosphere for students to learn. The teacher at site six mentioned that gardening provides students an awareness of different types of plants and can spark an early enthusiasm for gardening in young students.

At site seven, the environmental educator told of how gardening helps students understand where food comes from. This understanding can encourage sustainability, help make more nutritious food choices, develop awareness of the cycles of earth, and appreciate the natural interrelationships, such as the interaction between plants and insects. This educator also spoke of how gardening provides an “excellent, integrated and authentic learning experience. Students need to use math to plan out and plant their garden, they need to use science, [and] they can use language skills and art to record about their garden” (personal communication, February 22, 2011). From school gardening experience, this educator had also observed that gardening motivates students through integrated, real-world experiences.

Table 4.3 Benefits of Gardening from Interviewees’ Point of View

Benefits of Gardening from Interviewees’ Point of View
<ul style="list-style-type: none"> • Critical thinking, problem solving, and logic skills • Emotional and personal development as they nurture plants • Respect for nature • Connection between what students eat and what they plant • Nutritional benefits of enjoying local, healthy foods

- Awareness of different types of plant
- Enthusiasm for gardening
- Creates an authentic, integrated learning experience

State of Illinois and School Gardens

With the many benefits that gardening offers, I was interested in the interviewee's opinion about whether or not the state of Illinois would begin encouraging schools to integrate gardening into the curriculum. Only two of the interviewees thought that the state might try to encourage gardens; these were the environmental educator from site five and the environmental educator from site seven. From site five, the educator's view was that the state would not mandate that schools have a garden program, but they could encourage it in the future if the garden was being used as an effective educational resource. This educator also told about how gardening could fulfill state standards about the environment with gardening projects such as worm composting bins and fulfill standards in other subjects.

The educator from site seven mentioned that there is already a gardening movement in the Chicago Public Schools, where the goal is to have a garden in every school by 2020. This environmental educator also spoke of hopes that No Child Left Inside (NCLB) would pass legislation that would encourage gardening in schools because it allows students to learn outside.

The other interviewees had a somewhat unified view that the state would not encourage schools to integrate a garden program into the curriculum because it did not view gardening as an important priority. These reasons are listed in Table 4.4. The administrator at site four explained that not enough people in the state value gardening,

and went on to articulate that for the state to support gardening, it would need to give out more grants for school gardens and offer more professional development opportunities.

The teacher at site three also mentioned that no interest in gardens has been seen at the state level and only a minimal amount of funding has been given. This teacher could not see the state pushing gardening because it would require more funds. Another reason that the state might not support school gardens is that much of the gardening season happens during the summer, which is outside the academic school year. This teacher's thoughts were that the state might be more focused on more immediate activities that happen while school is in session.

Table 4.4 Reasons for State not Encouraging School Gardens

Reasons for State not Encouraging School Gardens
<ul style="list-style-type: none"> ▪ Limited funds ▪ Not enough people in the state value gardening ▪ Some of gardening happens in the summer when school is not in session

Table 4.5 lists ideas of integrating gardens without help from the state as shared by the interviewees. The teacher from site one stated that although the state would probably not encourage schools to have a garden program, the state would not be opposed to such a program. School garden programs can incorporate different state standards, including subjects like life skills, math, and science. The teacher from site two also thought the state would not encourage gardening. However, this teacher felt that programs such as the national agricultural program Future Farmers of America, also

known as FFA, could become more of a resource for encouraging teachers to integrate the garden into the curriculum. The teacher at site six expressed that in order to integrate gardens into schools, teachers would need to initiate their own school gardening projects.

Table 4.5 Ideas of Integrating Gardens without State Encouragement

Ideas for Integrating Gardens without State Encouragement
<ul style="list-style-type: none"> ▪ Incorporating current state standards into gardening lessons ▪ Teachers initiate their own garden projects

Each interviewee had a unique view of school gardening based on past experiences and current involvement in a school garden program. The interviews provided insights about the future state involvement in school gardening, the benefits of gardening, the present teacher training for gardening, the influence of past experience on incorporating the garden into the classroom, and the obstacles of integrating gardening into the classroom.

CHAPTER FIVE: DISCUSSION

Integration of Gardening into Curriculum

The purpose of this project was to evaluate how gardening is being integrated into classroom curriculum in the state of Illinois and the factors that led to this integration. From the interviewed sites, the sites that did integrate gardening into the curriculum were the charter schools and the high school horticulture class. The first charter school, site four, was a school built on ideas of sustainability and global awareness, and the garden was an integral part of that mission. The mission statement affirms that the school exists to “foster environmental stewardship” (Ippel, 2010), and the organic garden was a part of establishing that goal. This school was founded not only with the desire to foster environmental awareness, but also with a specific plan. The garden was created with the school, and a wellness teacher was hired to help facilitate using the garden in the wellness class. Beyond this wellness class, teachers are encouraged by administration to incorporate the garden into their lessons. The school uses a philosophy of education called “International Baccalaureate Primary Years Program,” which educates students in units with different interdisciplinary themes. Students may study a unit such as trees for a set number of weeks. Some of these units may incorporate the garden or other outdoor topics.

The second charter school, site seven, was built on sustainability and outdoor education. The school’s mission speaks of “students who spend part of each day outdoors, learning experientially from their natural environment. And add to that the knowledge that these students gain regarding how to care for themselves and the earth”

(Whittington, 2011). This school's mission included sustainability and outdoor experience, and the garden was a part of that vision.

The second school that integrated gardening into the classroom was the high school and the integration occurred in the horticulture class. Like the charter school, this class was designed with a mission that incorporated plants. The teacher of the class used the on-site greenhouse as a teaching tool to further the mission of teaching students about plants. However, though the greenhouse was used for students in the horticulture class, none of the other classes in the school took advantage of this gardening resource. The horticulture teacher that I interviewed also taught an introductory biology class, and when asked about integration in other classes in the school, she spoke of the lack of integration, but then began to think of ways she could use the greenhouse in the biology class.

The sites that had a garden but did not incorporate it into the curriculum were the three elementary schools and the University of Illinois extension program. The three elementary schools were traditional public schools that did not have gardening in their mission statement. School committees started these garden projects, and these committees had to plan the necessary means for the garden. Unlike the charter school, where the garden was incorporated into the mission statement, these committees were bringing the garden into the school. Simply creating a garden project was a large task, and integration of it into the curriculum would have taken greater efforts.

Also, most of these school gardens were only a few years old. It is possible that in time, once the gardens are more established, integration will occur. For example, at site one, the teacher mentioned that the garden had just been created that spring and that integration was a future goal. Further areas of research could look into what types of

resources will help these teachers incorporate already established gardens into their classroom. Resources could be aids such as gardening lesson plans that include state standards, teacher education about garden integration, or some method of communication between gardening educators.

Opening the Discussion

When interviewing the teacher from site one, the interview questions actually inspired new ideas about how to integrate the school greenhouse into the biology class, whereas before it was only integrated into the horticulture class. Also, when interviewing the educator from the University of Illinois extension program, the idea of teacher in-services helped the educator begin thinking about creating teacher in-services for schools.

The way that the interview questions sparked new ideas in the interviewees illustrated that the first step to integration could begin simply with asking a question. Especially with education leaders who already have an interest in gardening, asking a question can spark an idea and rekindle the interest in sharing gardening with students. A question cannot only inspire new ideas, but it also reminds them they are part of a greater educational community of gardeners. Oftentimes, teachers with specific interests, such as gardening, are a minority in their schools, and they lack the input of others to motivate and enthuse them. Well-stated questions, specific to an interest, can remind them that others are interested in this topic and find it important. Future research could be done to evaluate if these interviewees acted on their expressed ideas.

The State of Illinois Encouraging School Gardens

When responding to the question about whether the state of Illinois would encourage school gardens in the future, interviewees' answers varied. The environmental educator thought that the state would encourage school gardens if the teachers' gardens could incorporate state standards into the garden projects. However, the educator from site one stated that the state would not encourage school gardens, but the state would not oppose gardens because they could include state standards. Both educators gave the same reasoning, but came to different conclusions. It is possible that the environmental educator, who was part of the University of Illinois extension, saw a different side of the state because of the connection to the University, while the teacher had a different perspective after working in a state public school. Another reason for this discrepancy could be that the word "encouragement" could have different definitions for each educator. The environmental educator could have thought encouragement from the state would mean more educational resources, while the teachers' thoughts of encouragement could have been more of encouragement with finances. With the limited finances of the state currently, the teachers' opinion might be that these funds would not be put towards school gardens.

Teacher In-Services

Research question four sought to discover if there was a correlation between those schools that integrated gardening into the curriculum with those schools that had teacher workshops in gardening. However, neither of the sites that integrated gardening into the classroom had teacher in-services. The sites that did not integrate gardening into the

curriculum also did not have teacher in-services for gardening. A teacher from one of the sites mentioned that many of the teacher institute days are primarily focused on reading and math.

This lack of teacher education in gardening could be an area of future research. At the end of a comprehensive paper that evaluated the current research on school gardens, Blair (2009) recommended areas for research writing, “Studies have not addressed school-garden continuity or failure, but they have addressed the lack of teacher preparations for using garden instruction” (p. 42). Though the point that there exists a lack of teacher preparation had been established, the studies evaluating any current programs that educate teachers about integrating school gardens have not been done. What types of programs exist to educate teachers about how to integrate school gardens? How effective are these programs at helping teachers integrate the garden? The University of Illinois extension educator did mention a desire to set up a teacher institute day, but will schools be open to spending time and money educating teachers about this? These questions could be discussion for future research.

Benefits of Gardening Confirmed

The benefits of gardening researched in the review of literature were echoed in the interviewees’ responses. Mentioned benefits of school gardens were critical thinking skills, personal development, respect for nature, connection with food, nutritional benefits, botany awareness, and enthusiasm for gardening. This confirmed that the researched studies from the Review of Literature, though from different states and school settings, resonated with local educators.

For example, one benefit of gardening that the research matched the interviewees' responses was the increased awareness of nutrition. Parmer, Salsibury-Glennon, Shannon and Stuempler's (2009) research in the nutritional benefits of gardening exposed how students in nutritional classes that incorporated a garden into the curriculum were more likely to eat fruits and vegetables at meals. This point was echoed in the interviewees' responses about the dietary benefits of gardening. Also, two of the interviewees mentioned that gardening connected the students with what they eat. When quoting Thorp and Thorp (2001), Blair (2009) also stated this idea when writing, "Gardening changes the status of food for all involved...Food that we grow with our own hands becomes a portal for personal transformation" (p. 18). Both the researchers and the interviewees acknowledged that gardening has a deeper significance than the physical plants, but rather begins to transform the way we think and can even lead to personal inspiration.

Another example of how interviewees' responses confirmed previous research was in the area of environmental awareness. When describing how environmental attitudes are formed with both the mind and the emotions, Pe'er, Goldman, and Yavetz (2007) wrote that gardening helps students connect at an affective level. Three of the interviewees mentioned that gardens not only expose students to different plants, but also can inspire students' enthusiasm for planting and growing. When students can connect to gardening at this affective level, such as in enthusiasm for plants, their personal attitudes towards the environment can change with both their heads and their hearts.

Since the benefits of gardening have been supported through this research as well as other studies, future research will need to determine how each of these benefits can be incorporated in specific ways into school gardening programs.

Areas of Future Research

As mentioned before, one area of further research is teacher education with school gardens. Research could be done on what type of programs are used educating current teachers about how to integrate gardening into the curriculum and the effectiveness of these programs. Also, research could be done on how or if school gardens are incorporated into different teacher preparation courses, such as environmental science or biology. Researchers would first need to discover if school gardening is a part of the course and then begin to evaluate the different methods exposing future teachers to garden programs. What is the best way to teach pre-service teachers about the benefits of gardening? Some methods might have a more hands-on approach in the garden while others may have these pre-service teachers visit local school gardens or do field experience hours in these schools.

Another area of research would be to evaluate the different resources that would aid teachers in incorporating the school gardening into the curriculum. The researcher could do an evaluative study of what is available and how beneficial these resources are for teachers. The study might even begin some kind of communicative project, such as the creation of a magazine or website that gives teachers lesson plan ideas, displays different school gardens, and provides gardening tips, as well as ideas on how to get the community involved in the garden.

First Steps

When seeing the broad scope of questions on integrating school gardens into the classroom, it can be overwhelming. We can all be encouraged that projects, whether large or small, begin with a first step. When speaking of incorporating gardening into the classroom, one of the educators mentioned that bringing plants into the curriculum can be as simple as planting seeds or having other small plants in the classroom. Integrating gardening does not need to be complicated or frustrating, but rather an opportunity to work together as educators to expose students to this important aspect of life.

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Appendix A

Consent Form

The purpose of the project is to research ways to integrate gardening into the curriculum. As participants, you are asked to share your knowledge of integrating gardening into the classroom. Your participation is voluntary and can be withdrawn any time. Your participation is greatly appreciated and your insights will be used to give better knowledge about gardening to the education community.

Signature_____

Date_____

Appendix B

Administrator Interview Questions

1. Have you worked in a school with a garden program?
2. Have you thought of integrating a school garden program in your school?
 - a. If so, what grade levels and what type of program?
 - b. If not, what prevents you from doing so?
3. Have you had any teacher in-services on the benefits of garden programs?
4. What experience do you personally have with gardening?
5. It appears that many other states have schools, both public and private, with gardening programs. Do you see Illinois as possibly encouraging its schools to integrate a gardening program into the curriculum? Why or why not?
6. Do any of your teachers currently have a garden program in their classroom?
7. What benefits do you see for students who would participate in a garden program?

Teacher Interview Question

1. Have you worked in a school with a garden program?
2. Have you thought of integrating a school garden program in your classroom?
 - a. If so, how long have integrated gardening into your curriculum and what type of program do you have?
 - b. If not, what prevents you from doing so?
3. Have you had any teacher in-services on the benefits of garden programs?
4. What experience do you personally have with gardening?
5. It appears that many other states have schools, both public and private, with gardening programs. Do you see Illinois as possibly encouraging its schools to integrate a gardening program into the curriculum? Why or why not?
6. Do any of your teachers currently have a garden program in their classroom?
7. What benefits do you see for students who would participate in a garden program?

Appendix C

Site #1	Bradley West Elementary School
Site #2	Dewitt High School
Site #3	LeVasseur Elementary School
Site #4	Global Citizenship Academy
Site #5	University of Illinois Horticulture Extension
Site #6	Alan Shepard Elementary School