

A CASE STUDY:  
USING A SCHOOL GARDEN TO CREATE MEANINGFUL  
LEARNING

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by

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## CHAPTER ONE

### INTRODUCTION

Educators are faced with the growing problem of creating a curriculum that generates enthusiasm among students, while also meeting academic content standards. The creation of content standards has caused learning to become less about the process of learning and more about the results of academic testing, resulting in the distancing of meaningful learning. Kraft and Billing (1997) state, "...if learning is to be authentic...students (must) have ownership in, and share responsibility for their own learning" (p. 7).

One way to create meaningful learning for students is to implement a curriculum designed around experiential learning; the idea of "engag(ing) learners in direct experience and focused reflection in order to increase knowledge, develop skills and clarify values" (Association of Experiential Education, 2009). Experiential learning, also known as hands-on learning, can be geared to specifically meet academic content standards, while fully engaging students in the process of learning. This research project will focus on the benefits of incorporating a hands-on gardening project at an elementary school in Southeast Ohio.

#### Background

Buckeye Elementary School is located in the Northeastern part of Pawpaw County. Pawpaw County is the poorest County in Ohio, with a poverty rate of 27.4% (US Census Bureau, 2000). The school serves students from preschool through fifth grade, approximately 640 children. According to the school's website 98.1% of the students are white, 58.1% of students are economically disadvantaged, 62.4% of students qualify for free and reduced lunch, and 18.2% of students have a disability. The Buckeye School District is ranked as "continuous

improvement”); meaning they did not meet the federal academic yearly progress report for two or more years (Ohio Department of Education, 2009).

The introduction of gardens in school landscapes and within curriculum has been an ongoing trend throughout the U.S. and Canada (Pennington, 1988). In 2003, schools in Pawpaw County started a partnership with Sustainable Food Practices (SFP), a non-profit organization dedicated to teaching sustainability, food production, and the importance of eating locally to area residents. The organizations creation of edible schoolyard projects has had great success in local schools. In 2008, SFP received a three year grant totaling \$50,000, to help fund various projects and operating costs. This grant, along with money allocated from a \$50,000 school wellness initiative grant, allowed for SFP to expand its edible schoolyard project into Buckeye Elementary School.

#### Statement of the Problem

This paper will examine the benefits of creating a curriculum surrounding the use of a garden. Specific objectives of meeting the Ohio Academic Content Standards, utilizing experiential learning, making learning meaningful, importance of community involvement, adding fresh produce to the school lunch program, environmental-based education programs, and successful school garden projects will be the main focus of the literature review and research.

#### Research Questions

This master’s research project seeks to answer the following research questions:

What factors make learning meaningful for students?

What beliefs do educators hold about experiential learning and garden projects?

What guidelines are needed for creating a schoolyard garden project?

## Limitations

Major limiting factors for this master's research project are:

1. Quantitative data surrounding research on garden projects within the school settings is limited. Most research found was opinion based, or qualitative data.
2. This case study was conducted using only one rural school, in an area of limited resources and a low socioeconomic demographic. If the project was done in an area with greater resources the findings might have been different.
3. The project was conducted over a one-year period, beginning in the Fall of 2008 and ending in the Summer of 2009. Teacher and student involvement might have changed during the following school year.
4. Research concerning the study was limited to resources available on the internet, through the University libraries, teacher and administrator surveys, and information obtained through SFP.
5. I was directly linked with the project through funding and employment; therefore may well express a personal bias. Also, the observations made are that of my own opinion.

## Definition of Terms

**Experiential education/learning:** A philosophy and methodology, in which educators purposefully engage with learners in direct experience and focused reflection in order to increase knowledge, develop skills and clarify values (Association of Experiential Education, 2009).

**Facilitator:** One who created the environment for engagement (Smith, M.K., 2004).

**Academic Yearly Progress (AYP):** The federal mandate that holds schools accountable for the performance of subgroups, as well as all students. The goals for schools, districts, and the state

are to meet or to exceed the annual objective or to make progress over the previous year (Ohio Department of Education, 2009).

Continuous Improvement: A school or district enters improvement status after missing AYP for two consecutive years (Ohio Department of Education, 2009).

Standardized tests: Tests given to students that are “developed, administered, and scored using established procedures and guidelines” (Education Measurement Group of Pearson, 2010)

High stakes testing: Standardized tests that evaluate

“state-level policies in which student test scores are used to determine various consequences, such as whether the students graduate or are promoted to the next grade, whether their teachers are awarded bonuses, or whether their school is taken over by the state” (US Department of Education, 2003).

Early Childhood: Young children from birth through 8 years of age (NAEYC, 2010).

Middle Childhood: A child between the age of 9 and 12 (Center for Disease Control, 2010).

Environmental Education: Programs for creating awareness about environmental issues in order to provide students with skills necessary to take responsible action for the environment (US Environmental Protection Agency, 2010).

### Methodology

This paper is a combination of a literature review from articles collected on the University libraries website and the world wide web, and a case study in which implementation of a garden project at the school was established during the time of my research.

### Organization of Study

Chapter one provides the introduction of the problem and presents background information regarding the school demographics, and the garden project. Also, the three research

questions that were presented will direct the information in this paper. Chapter two is a review of the literature. Chapter three is the presentation and analysis of Buckeye Elementary School's garden project, which will include data from school personnel surveys, breakdown of the garden's success, and recommendations for future developments of the garden. Chapter four examines the literature review, and the review of Buckeye Elementary School's garden to make a conclusion of how best to implement a successful school garden project in other schools.

## CHAPTER TWO

### REVIEW OF THE LITERATURE

#### Introduction

The research literature reviewed in this chapter focuses on the complexity of creating a curriculum geared towards emphasizing a learning environment promotes a holistic approach towards the education of students. Included in the review are published books, journal articles, leading educational and international organizations' position statements, and examinations of successful garden projects throughout the United States. The literature review is broken down into seven subcategories. These include; 1.) Academic Content Standards, 2.) Theories of Experiential Learning, 3.) Meaningful Learning, 4.) Community Involvement, 5.) Fresh Produce in Schools, 6.) Environmental-Based Education, 7.) School Garden Projects.

#### Academic Content Standards

The Ohio Academic Content Standards were adopted in 1997 by a joint council of the Board of Education and the Ohio Board of Regents in order to “provide a set of clear and rigorous expectations for all students” (Ohio Department of Education, 2010). The creation of content standards caused a need for standardized content-based tests to “measure students on what they know and are able to do” (Ohio Department of Education, 2008). The use of content standards and standardized tests has been controversial. Advocates for high stakes testing believe the tests are a tool for measuring teacher effectiveness and student learning. In a study consisting of responses from students, teachers, and parents, Ballard and Bates (2008) concluded parents and teachers agreed that standardized tests created a consistent measure of student performance when compared to other school districts within the state. However, the same study

also found parents and educators believe too much emphasis on the content of the tests can be detrimental to student learning.

A study conducted by Amrein and Berliner (2002), looked at the history of 18 states' standardized tests and their impact on student learning. They concluded the validity of the tests is insignificant when judging whether students actually learned material necessary for success in school and life. According to Amrein and Berliner (2002), "test(s) will become the curriculum and ... instruction will be narrow and focused on facts" (p. 12). The idea of "teaching to the test" has been discussed extensively among those who challenge standardized testing. Reports have indicated students are only learning to take the tests well but are not able to make connections to meaningful learning (Kohn, 2000). The increase of standardized tests being used as the single most important tool for measuring a students' success has caused some content areas to take a back seat to subjects that are tested more often, such as math and reading (Bracey, 2003). Social Studies is one area not heavily tested by standardized tests. One particular study, examined elementary and middle school teachers ability to allocate time for teaching social studies. The study found the majority of teachers spent on average only 30 minutes per week teaching social studies content (Burroughs, Groce, & Webeck, 2005). This increase in testing high stakes subjects has also reduced time spent on many extra-curricular activities from schools, including recess. However, recess and free play in school settings has been shown to increase student motivation, and builds upon social, emotional, and physical development (Geiger 1996).

### Theories of Experiential Education

Experiential learning theory is defined as, "The process whereby knowledge is created through the transformation of experience; knowledge results from the combination of grasping and transforming experience" (Kolb, p. 41). Experiential learning is not a new phenomenon within

the education world. John Dewey first introduced the idea in his 1938 book, *Experience and Education*. Dewey stated, “Anything which can be called a study, whether arithmetic, history, geography, or one of the natural sciences, must be derived from materials which at the outset fall within the scope of ordinary life-experience” (p. 86). Experiential learning is the idea that learning must connect with a student’s experiences in order to become meaningful.

Dewey is not the only philosopher to advocate for experiential learning. Jean Piaget, a child development psychologist, studied the way children’s minds work, particularly in the realm of education. Piaget believed that all children reach certain milestones at different rates of development, and until their maturity level increases, certain concepts will not be understood. Piaget believed the importance of formal schooling is to facilitate learning so the child can make connections from his or her own intuitions (Richardson & Sheldon, 1988). Piaget recognized four stages of development; sensory-motor (birth-2 years), pre-operational (2-7 years), concrete operational (7-11 years), and formal operation (11 years-adulthood) (Piaget, 1970). According to Piaget (1970) a child’s environment can also impact development, “The speed of development, however, can vary from one individual to another and also from one social environment to another” (p. 157).

In *The Psychology of the Child*, Piaget (1969) argued that during the sensory-motor stage, the infant recognizes the difference between self and objects, and is able to manipulate objects within its environment. After the child has mastered this concept and has developed *some* language skills, he or she progresses to the pre-operational stage. During this stage, a child begins to classify objects in order to make sense of the objects differences and abilities. For instance; at the beginning of the stage, a child may recognize insects, and can use language to identify the insect. As the child progresses through the pre-operational stage, he or she may

begin to classify the species of insects, and recognize insects that may cause pain if touched. Once the child has mastered the pre-operational stage, he or she moves on to the concrete operational stage. The child can now think in a logical manner about events and objects. Using the insect example; a child may begin to notice a difference in numbers between two types of insects within a garden setting (more worms than butterflies). As the child progresses through the stage, he or she may begin to question why one type of insect is more prevalent than another. But it is not until a child is in the formal operational stage that he or she can develop a clear hypothesis as to why there are more worms than butterflies. During the formal operational stage, a child develops the ability to think abstractly and make predictions by using his or her previous knowledge and current environment. Also, during the formal operational stage a child may begin to sympathize about the future of the butterflies existence, and think of ways to restore the butterfly population, or other ecological dangers.

Renowned Philosopher Howard Gardner is best known for his theory of Multiple Intelligences, the idea that people can exhibit different kinds of intelligences. In the *Unschooled Mind*, (1991) he discusses the intelligences, which include; linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, interpersonal, and intrapersonal. Since, Gardner (1999) has added two additional intelligences: naturalistic and spiritualistic.

A person who is said to be linguistically intelligent has the ability to learn languages and express information poetically and with ease. One who exhibits logical-mathematical intelligences understands information in an analytical or scientific manner. He or she possesses the ability to use patterns in order to think logically. A person who is said to have spatial intelligences is able to visualize an object and comprehend its importance without it actually being present. For example, an architect can imagine what a space may look like by interpreting

the blue prints he or she designed. Athletes are said to have bodily-kinesthetic intelligences, the ability to allow your mental capacity to drive the physical capacity of your body. A person who has musical intelligence understands the different pitches and tones within music and can interpret the information into a composition. A person who exhibits interpersonal intelligence is able to connect well with others, and can understand a person's intentions or motivations easily; while a person who has intrapersonal intelligence is able to understand self, and his or her own motivations and intentions. A person who possesses naturalistic intelligence understands the differences and classifications within nature, while a person who is said to have spiritual intelligence has the ability to explore and comprehend the nature of existence.

In order to allow expression for multiple intelligences, one should create an environment, such as a school garden, that lends itself to all types of learners. As Gardner (1991) has argued, "Some students perform best when asked to manipulate symbols of various sorts, while others are better able to display their understandings through a hands-on demonstration or through interactions with other individuals" (p. 12).

### Meaningful Learning

The goal of experiential learning is to make learning meaningful for students (Sternberg & Zhang 2001). Research has shown students learn best when there are opportunities to use their own experiences as a foundation for learning (Kraft & Billing 1997). The National Association for the Education of Young Children [NAEYC] confirms the importance of direct, first hand, interactive knowledge. Its position statement argues that, "during the preschool years and early primary grades, children learn best through active, engaged, meaningful experiences" (NAEYC, 2009, p. 14).

The National Middle School Association (NMSA), in its position statement *This We Believe: Keys to Educating Young Adolescents* (2010) lists sixteen characteristics of a successful school curriculum and environment. These characteristics include: *Students and teachers are engaged in active, purposeful learning, Curriculum is challenging, exploratory, integrative, and relevant, and Educators use multiple learning and teaching approaches.* Middle school students have shown to benefit from experience-based learning. In a three-year case study of middle school student's perspective on learning styles Bishop, Allen-Malley and Brinegar (2007) that students who actively participate in the development and facilitation of their learning are more apt to be engaged learners.

#### Community Involvement

In 1994, Congress enacted legislation referred to as, Goals 2000: The Educate America Act. Its purpose was;

“To improve learning and teaching by providing a national framework for education reform; to promote the research, consensus building, and systemic changes needed to ensure equitable educational opportunities and high levels of educational achievement for all students...” (US Department of Education, 2009).

The Act specifically focused on designing programs that connect families and communities with schools to promote better student learning. In 1996, Johns Hopkins University established the National Network of Partnership Schools (NNPS), to create and maintain effective school and community collaborations. Joyce Epstein (2001), Director of NNPS, has suggested *six types of involvement* schools and communities can establish. These include:

1. Parenting- Help all families establish home environments to support children as students.

2. Communicating- Design effective forms of school to home and home to school communications about school programs and children's progress.
3. Volunteering- Recruit and organize parent help and support.
4. Learning at Home- Provide information and ideas to families about how to help students at home with homework and other curriculum-related activities, decisions, and planning.
5. Decision Making- Include parents in school decisions, developing parent leaders and representatives.
6. Collaborating with Community- Identify and integrate resources and service from the community to strengthen school programs, family practices, and student learning and development.

In her research Epstein discovered the value of implementing community involvement within the schools, and came to recognize its potential to have a positive impact on students, school, and community.

Community involvement has been linked to improved student achievement, higher attendance rates, better social skills, and higher rates of postsecondary education (Averett, Jordan, & Orozco, 2002) which aligns with the view of The Coalition for Community Schools, an organization dedicated to the improvement of community schools. The Coalition for Community Schools found that community involvement within schools improved student achievement, increased family stability and involvement with schools, improved both teacher satisfaction rates and school environments, and provided better use of school buildings while increasing security and pride within the neighborhoods (Blank, DeBoe-Johnson, & Shah, 2003).

## Fresh Produce in School Programs

Including fruits and vegetables as a part of a balanced diet is important for optimal child growth, weight management, and chronic disease prevention (US Department of Health and Human Services, 2005). However, recent trends in American diets have created an increase in unhealthy eating habits and obesity rates. The childhood obesity rate in the United States has tripled in the last thirty years; rising from 5.0% to 18.1% for children, ages 12-19 years (Center for Disease Control, 2010). More alarming is the statistic that one in seven children living in poverty is now considered obese (Center for Disease Control, 2010). In 2006, the National School Lunch Program, a federal food assistance program, provided 28 million low-cost or free lunches each school day (Guthrie, Newman, & Ralston, 2009). Unfortunately, the lunch program only provides an adequate basis for healthy food consumption; especially the intake of fruits and vegetables (Robinson, O'Brien, Burgess-Champoux, Haines, Hannan, Neumark-Sztainer, 2010).

Slow Food initiatives, the idea of creating a sustainable, local, and quality agricultural community (Petrescu-Mag, 2009), are changing the way some schools envision their lunch programs. Slow Food International, the leading advocate for the promotion of slow food, was created to “counter the rise of fast food and fast life, the disappearance of local food traditions and people’s dwindling interest in the food they eat, where it comes from, how it tastes and how our food choices affect the rest of the world” (Slow Food, 2010). By implementing school gardens, schools have been able to provide learning laboratories, fresh produce, and provide an alternative form of exercise for students (Ozer, 2007). Also, because students are participating in the garden project with their peers, growing and consuming healthier food will be more accepted as a social norm (Ozer, 2007).

## Environmental-Based Education

Many educators in the field of science or environmental education are familiar with such programs as Project WILD, a wildlife-based conservation and environmental education program that creates an interactive student-centered, hands-on approach to learning (Project Wild, 2010). Including environmental education in school curriculum is not a new phenomenon. In fact, Project WILD, was first introduced in 1983, in collaboration with the Council for Environmental Education (CEE). In 2006, Project WILD grew to include over one million trained educators, fifty-three million youth have been involved throughout its first 23 years in service, and it now has a represented program in each of the fifty states (Project Wild, 2010). In 2000, Project WILD underwent a revamping of its goals and standards in an effort to align itself with changes in educational practices. This allowed the program to focus on such topics as land-use issues, habitat loss and fragmentation, biodiversity, invasive species, sustainability, and human management concerns (Project Wild, 2010).

According to the Project WILD website, in 2002, in collaboration with The Ohio State University, a study was conducted focusing on teacher attitudes towards Project WILD. Of the 231 teachers who participated in the study reported Project WILD to be “effective” and allow students to “see many sides to environmental issues” (Pitman, 2004; Heimlich, 2002).

Another not as well known but highly-effective organization, is called State Education and Environment Roundtables (*SEER*). It works in collaboration with 16 state Departments of Education, to “enhance student achievement, improve K-12 instructional practices and help schools achieve their improvement goals by implementing the EIC Model” (State Education and Environment Roundtables, 2005). The EIC Model stands for Environment as an Integrating Context for improving student learning. The organization focuses on utilizing constructivist,

student-centered approaches to learning while using the environmental landscape as a means for education (State Education and Environment Roundtables, 2010). In 1998, SEER published a report known as *Closing the Achievement Gap* (Lieberman & Hoody). Forty schools involved in using the EIC model participated in the study, which included teacher surveys, student and teacher interviews and collection of standardized tests. The report found:

- higher scores on standardized measures of academic achievement in reading, writing, math, science, and social studies;
- reduced discipline and classroom management problems;
- increased student engagement and enthusiasm for learning; and,
- greater pride and ownership in students' accomplishments.

Although organizations like ProjectWILD and SEER have improved student learning and achievement, schools have been hesitant about participating in such programs. Curriculum has often been narrowed to include certain subjects and materials that are more widely tested; such as reading and math. In one study, school administrators were asked about the impact of increased standardized testing had on subjects not tested. The most common answer they provided was a *reduction of resources and time for non-tested subject areas* (Pederson, 2007).

The implementation of a more rigid curriculum into the educational system can be one such factor for environment-based curriculum's eradication. Many states and school districts are rightfully fearful of the impact of No Child Left Behind Act's ability to create change *for better or worse*. However, educators recognize that not all students can be reached by textbook alone. The need for differentiated instruction is often substituted for teaching students how to "pass the test," which can result in the narrowing of educational practices formerly used to encourage

students who do not fall in the typical student-achievement spectrum range; such as gifted students, and students with special needs (Scot, Callahan, & Urquhart, 2009).

### School Garden Projects

In California, a study was conducted involving approximately 4,200 principals whose schools actively participated in a school garden project. The mail-based survey asked specific questions pertaining to their school garden usage. The study concluded that most schools used their gardens as a way to enhance academic achievement; especially in the areas of science, nutrition and environmental studies (Graham & Zidenberg-Cherr, 2005). California is a leading state in the development and implementation of gardens on school grounds. The California Department of Education has created an initiative called *A Garden in Every School*. Its program aims to “promote linkages among the school classroom, school cafeteria, local agriculture, waste management, and others” (California Department of Education, 2010). The state has partnered with many non-profit organizations dedicated to slow food movements within schools. One such partnership is the California School Garden Network (CSGN). In conjunction with *A Garden in Every School* program, CSGN seeks to provide community, volunteer, and monetary support in order to encourage the ongoing efforts of the California Department of Education’s initiative. CSGN has created a partnership with over 40 organizations in order to fulfill its mission.

Claremont Middle School in Oakland, California is one such school that has benefited from the collaborative efforts (California School Garden Network, 2010). Claremont is an inner city school serving the needs of 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> graders. Grant money provided the school with the funding necessary to create a school garden and hire a part-time garden coordinator to oversee the program. Utilizing students and volunteers, Claremont was able to build a school garden that links the academic and nutritional needs of its students. The students in an

afterschool art program designed the space and created recycled artwork to beautify the area. The garden coordinator meets every other week with each of the science classes. Her goal is to incorporate the garden into content the students are learning in their science classes. By doing so, the students are able to conceptualize material learned inside and apply it to a hands-on experience. The success of the program has been a model for other schools creating gardens on their campuses.

Chico Junior High School in Chico, California is another successful California School Garden Network school. Chico, an agricultural community, developed its school garden by including the community. Not only did the school have support from the farming community, but its close proximity to California State University at Chico provided the school with the resources it needed to develop a successful community partnership. Volunteers from the agriculture community and from the University donated their time and knowledge to help create projects such as a greenhouse, and plant propagation program.

The accomplishments of Chico Junior High School were made possible by incorporating not only the community, but also the teachers in the process. Teachers were asked to brainstorm ways they would use the garden project in their classrooms. The teachers collaborated on what projects would be successful for their students, and what projects may be more intensive than they can handle. By including teachers in the process the school was able to build the bridge between the garden project being a concept into its reality (California School Garden Network, 2010).

## CHAPTER THREE

### METHODOLOGY

#### Background

The purpose of this study was to examine the research and opinions of educators surrounding the benefits of implementing a school garden. Chapter Two consisted of the literature regarding school gardens. By focusing on the opinions of teachers at the participating school, Chapter Three seeks to present the methodology used to answer the question: *What beliefs do educators hold about experiential learning and garden projects?* In order to gather accurate data the participants each answered a 10-question survey consisting of open-ended questions. Along with the survey, interviews regarding the garden project were conducted with staff members at Buckeye Elementary. Also, impressionistic observations made about the school's garden implementation process were analyzed. Impressionistic observations are a type of observation that requires the researcher to use multiple roles in order to collect data. These can include defining yourself as a participant within the group being observed, or as an outsider who is only concerned about observing group interaction (Baker, 2006). In my role as a member of the Wellness Team meant I was directly involved in the garden project, which made me a participant observer. During the course of my involvement, I took notes at every meeting I attended. These notes included areas of the project that were successful, and aspects of the project that needed improvement. Towards the completion of my observations I began analyzing the observations. I listed the *positive* and *needs improvement* aspects of the project, and used those observations to formulate my interview questions. By applying the observations I made towards the interviews I conducted, I hoped to engage the interviewees in critically analyzing why they believed the garden project's successes were and what areas were still in need of

improvement. The findings in this research project may help future school's create a successful school garden that encompasses the wants and needs of everyone involved.

### Participants

As described in Chapter 1, Buckeye Elementary School is the only elementary school within the Buckeye School District. The school, located in a large mid-western state, is situated on a sprawling campus which also houses the high school, and the middle school. Over half the students within the district are considered economically disadvantaged, and almost one fifth of the students have a diagnosed learning disability.

The participants in this study consisted of teachers and staff at the Buckeye Elementary School, a pseudonym used to provide anonymity. The questionnaire was given to all teachers, and the interviewees consisted of teachers or staff members who had a potential stake in the garden's creation. Buckeye Elementary School consists of preschool through fifth grade. The teachers who teach preschool through third grade teach all content areas, while the fourth and fifth grade teachers teach either one or two content areas. Because the questionnaires were anonymous the results do not account for the subject or grade level at which the participants teach.

The interviewees consisted of the wellness team co-chair, the school nurse, an AmeriCorps member employed at the school, and a first grade teacher. The participants were chosen because of their varying levels of involvement with the project. Interviewing staff that could offer multiple perspectives of the garden project would provide a more well-rounded view of the garden project's meaningfulness within the school community. The co-chair was responsible for implementing the project, the school nurse was a wellness team member, the AmeriCorps member was directly involved in developing curriculum for the garden project, and

the first grade teacher appeared to best reflect the feelings of other teachers who would use the garden. Because the questionnaires were anonymous, I do not know whether the four interviewees completed the questionnaire. The interviewees were selected because they had previous knowledge of the garden project, or were directly involved in its implementation; most specifically the wellness team co-chair, school nurse, and the AmeriCorps member. The teacher I interviewed taught 1st grade. She was chosen because she was responsible for teaching all subjects within an inclusive classroom. Furthermore, the teacher was a Buckeye alumna. She had close ties to the school and community which provided a more well-rounded perspective of the student population, teachers, and community involvement.

#### Data Collection

Data collected during this project consisted of teacher surveys, staff interviews, and direct observations; all of which are considered qualitative data. Bernard and Ryan (2010) define qualitative data as the ability to “reduce people’s thoughts, behaviors, emotions, artifacts, and environments to sounds, words, or pictures...” (p. 5). The survey consisted of 10 open-ended questions pertaining to the teacher’s opinions about the school demographics, and their future participation with the garden project. Open-ended questions, as a means of collecting data, were chosen because they allow for comparing similarities and differences between the participants’ answers (Scott & Morrison, 2006). Each participant received the same questionnaire which ensured a similar set of cues was reproduced, thus leading to a higher rate of validity (Bernard & Ryan, 2010).

After receiving verbal consent from the administration, the questionnaire was placed in each teacher’s school mailbox. The one page questionnaire (Appendix A) consisted of a

statement explaining the nature of the research and that their participation in the study would be completely anonymous.

The 10-item-questionnaire consisted of the teacher describing his or her students; including student demographics and classroom motivations. Next, it addressed the teachers' personal experiences with gardening. The questionnaire concluded with questions about how to best utilize a garden and whether it would be successful at the school.

Of the 37 teachers that were given questionnaires, 15 were filled out and returned, yielding a 40% participation rate. While the response rate is acceptable, the low number of returned questionnaires may potentially present a lack of representational data.

After collecting the questionnaires, I conducted the interviews. The questionnaires were completely anonymous, and therefore had no bearing on who was interviewed. The criterion for choosing the interviewees was based on their distinctive position within the school and the garden project. Because the data from the interviewees is subjective in nature, I chose participants based on obtaining specific information I was hoping to elicit. This included opinions about meaningful learning for students, positive and negative experiences from the garden project, and further implications for success.

During the garden project, I was employed at the school and was a wellness team member. Therefore, I had a unique understanding of the students, school environment, and the garden project. I observed and participated in the creation of the school garden, which included researching interest among staff and the community, meetings concerning the development of the garden, and site analysis of the garden's landscape.

## Data Analysis

The data of this study consisted of the results from the questionnaires, interviews, and observations made from interactions while working with the garden project. The data was analyzed by using qualitative data methods. Qualitative research seeks to investigate data by determining patterns, causes, and consequences (Gilner & Morgan, 2000). The modes of obtaining qualitative data are vast. Therefore, this research study specifically focused on a participatory case-study perspective, which is “a mode of case study research that involves the participants, local groups, or the community in all phases of the research process, from conceptualizing the study to writing up and disseminating the findings” (Reilly, 2010, p. 658). The data analysis within a participatory perspective includes individual and mutual perceptions, and any biases or experiences surrounding the case study (Reilly, 2010). I included three types of qualitative data (questionnaires, interviews, and observations) to triangulate my findings. However, because the data reflects the opinions and observations of one school’s garden project, the findings in this case study are unique to Buckeye Elementary School. Nonetheless, the findings in this study may help other schools create a successful garden model.

Because the questionnaire utilized an open-ended format, the teachers were encouraged to interpret and answer each question to the best of their ability and desire. Once the questionnaires were completed, the analyzing process began. By comparing the answers each teacher gave on the questionnaire, I was able to determine similarities and differences about student population, meaningful learning, and their feelings about the garden project. The interviews were also analyzed by comparing the similarities and differences among the answers given. The observation process was more difficult. In order to analyze my interaction in the garden project, I focused on what programs have been successful at Buckeye School District, and

what resources they have available. I also focused on the hierarchy of the school and wellness team. The observations made are those of my own accord, and may be interpreted differently by someone within the school district or outside the school district. Once all three data sets were received, I cohesively analyzed the results of the questionnaires, interviews and observations in order to qualitatively evaluate the outcomes easier.

The study has one significant limitation: most of the participants who completed the questionnaire stated they *did* have a garden at their home. This suggests they may have been more receptive to participating in a garden project, and may not fully represent the teacher population at Buckeye Elementary School. Chapter Four will present the findings in the study in three sections: Meaningful Learning, Teacher Beliefs, and Guidelines for Creating a School Garden. The participatory case-study design will be discussed greater throughout Chapter Four, which will draw upon Buckeye Elementary Schools experience, and may direct other school's initiation of implementing a school garden.

## CHAPTER FOUR

### FINDINGS

#### Introduction

This chapter presents the qualitative data gathered during the project. It is divided into two sections: teacher beliefs and support for a school garden at Buckeye Elementary. The data is comprised of the results from a survey completed by 15 teachers, representing two fifths of the teachers at Buckeye Elementary (see Appendix A), and interviews with four staff members at the school, including the Wellness Committee co-chair, the school nurse, a first grade teacher, and an AmeriCorps member (see Appendix B), as well as direct observations.

#### Teacher Beliefs

In order to assume the school consists of a fairly homogenous student population, prior knowledge about student demographics was important for this research project. In the survey administered to teachers, the first question asked them to describe their students. All 15 teachers described their students similarly, stating they came from middle to lower socioeconomic backgrounds. Three of the 15 also stated their classroom included students with disabilities.

The survey also asked the teachers what it is that motivated their students. Research has cited a growing trend of offering incentives to students as a motivation factor (Bowman, 2007). This holds true at Buckeye Elementary; 80% of teachers surveyed stated rewards work the best to motivate their students. Rewards can come in many forms. Hufton, Elliott, & Illushin (2003) focused research on two types; symbolic and material rewards. Symbolic rewards, such as praise, worked best for younger students, and material rewards, such as a homework pass, was best suited for older students. Rewards are considered an extrinsic factor that can intrinsically motivate students (Bowman, 2007). However, some research has suggested the offering of

rewards obstructs authentic learning and may become a student's major reason for learning (Covington & Mueller, 2001).

Another method for creating meaningful learning is providing opportunities for differentiated instruction. Differentiated instruction is an approach to teaching that incorporates a mixture of teaching methods to accommodate a variety of learning styles and ability levels (Lawrence-Brown, 2004). The survey asked teachers to list the ways that their students learn best. All fifteen teachers stated their students learn best when they have opportunities to use a hands-on approach, five also stated their students learned best when a variety of methods was used, and four stated their students learn best when the subject is relevant to their lives. This holds true as well for the interviews that were conducted. Staff members expressed the school garden's capability of providing a unique approach to enhance student learning. When asked, "*How do you see the garden project working within the school?*" Three of the four interviewees gave examples of how students could use the garden to learn specific content (science, economics, and math) while expanding their knowledge and responsibility throughout each grade level. The Wellness Team co-chair described the younger students learning how to develop starter plants (growing plants from seeds in a controlled indoor environment and then transitioning the plants into a garden setting), then having the older students sell the starter plants at the local Farmers Market. This example highlights the importance of creating authentic and purposeful learning that is rich in experiential education, group collaboration, and integrated learning styles; which echoes the findings of Chapter Two.

When asked, "*What common challenges do you face in your classroom?*" The most frequent answer teachers gave was the *lack of time (for all subjects)*. Teachers face a growing problem of delegating time to subjects not frequently tested (David, 2011). The first grade

teacher interviewed resonated similar feelings. When asked, “*What challenges will you face if you were to use the garden?*” She stated, “It would be difficult to find time to utilize it. I have to spend a lot of time teaching literacy.” The teachers are expressing beliefs held by many educational researchers and teachers who feel high-stakes testing has caused a narrowing of curriculum (David, 2011).

All but one of the 15 teachers who completed the survey stated they had a garden at their home. The overwhelming response of participants who have previous knowledge of gardening may have skewed the results of this study. However, it also mirrors similar arguments that state teachers focus learning around what *they* know and their interest level in a particular subject. Among the four interviewees, the Wellness Team co-chair, first grade teacher, and AmeriCorps member currently had a garden at their home. The school nurse said she had had a garden in the past but she had become too busy to maintain a garden this year. When the interviewees were asked about their initial feelings about the garden project, some common responses were, *excited, elated, and hopeful*. In a study conducted by Long & Moore (2008) teachers were surveyed about their level of interest in certain subjects they taught. The study concluded that the strongest determinant for teacher interest remained whether he or she had previous experiences or interest in the subjects he or she taught. Therefore, the teachers who responded to the questionnaire and the staff members who were interviewed may have had a higher level of comfort teaching in a garden setting.

When asked whether they would feel comfortable teaching in a garden setting 12 of the 15 teachers answered *yes*; with the remaining three saying they would feel comfortable if there were an additional support person, or teacher training. The comfort level of the staff can be an indicator of the success of the school garden. In a case study, Grenier (2010) examined the

success of providing teacher development programs in a non-formal setting; in this case, a museum. The study focused on history and social studies teachers involved in a summer program to develop additional content knowledge and teaching skills. The participants in the study were introduced to learning through a variety of methods; including hands-on, collaboration, and guest speakers. After the summer program, teachers stated they were able to transfer the knowledge gained at the museum into their classrooms; both pedagogical and subject matter content.

The teachers in this study were also asked to list ways in which they would use the garden within their instruction. Most stated they would use the garden to teach certain content; such as math and science. However, one teacher described using the garden to teach students about where food comes from and how to grow their own food. Another teacher presented the garden as a resource for teachers to teach students about “*the end product*” of how “*things*” grow. While the teachers who completed the survey focused more on the content-specific aspect of a garden’s use, the interviewees described additional uses. As mentioned previously, the idea of the students growing and selling vegetables at the Farmers Market was one goal for the Wellness Team members involved in the project. Another objective of the Wellness Team was to introduce more fresh food into the diet of students and their families. When asked, “*How would you like to involve the community?*” some ideas the interviewees included making the garden available to community members during the summer months, providing families assisted by supplemental food programs with the vegetables and fruit harvested, and helping create a partnership between the area colleges that offer environmental education programs. The AmeriCorps member viewed the garden project as a way to ensue change among families. He stated, “*First we can get the kids involved, and the kids tell their parents...maybe show them, and*

*that will make the parents more invested [in the garden].*” His response echoes what research has found, that more family and community partnerships can help support school programs; especially those focusing on health (Michael, Dittus, & Epstein, 2007).

When asked to describe ways it would be difficult to adapt a garden into the curriculum. Five of the 15 teachers stated that it would not be difficult and gave answers such as, *“learning about living things is part of our [curriculum] standards,”* or stated it can be used to teach *all* subjects in some capacity. Although the interviewees had similar answers when asked about the challenges a school garden may create, they also focused on the impact it may have on the school community; particularly from the standpoint of unions. As stated previously, the Wellness team desired to make fruits and vegetables more available to students, and therefore recognized the opportunity to utilize school lunches as a venue to provide school-grown produce. However, it acknowledged the apprehension cafeteria staff members might have with the added workload preparing the produce for the lunches. The co-chair of the Wellness Team referred to the situation as *“tricky because of the union issues with cooks.”* But then she offered a possible solution by suggesting the produce could be used for afternoon snacks. Three out of the four interviewees believed district budget cuts and predetermined staff contracts could pose a major challenge to the introduction of the garden. A review of California’s school wellness policy suggests similar findings. A case study focusing on determining the barriers to California’s wellness initiatives suggested that the lack of school funding and involving *all* staff members in the process was a major setback (Agron, Berends, Ellis, and Gonzalez, 2010).

When asked how often they would use the garden, the teachers’ answers varied. Five of the 15 teachers said it would depend on the weather or the content the students were learning, five said they would use it weekly, three said monthly, and two said as needed. The frequency of

the garden's use was fairly positive. One teacher said she would use it often because "*she teaches science.*" Another teacher stated she would use it as a way to vary learning and as a kind of reward for students. Because the teachers stated they would use the garden fairly frequently, it is of no surprise that when asked whether the garden project would be feasible they unanimously answered "yes."

### Support for a School Garden

In 2006, Congress passed a law requiring any school participating in the National School Lunch Act, or the Child Nutrition Act of 1966, must create a School Wellness Policy to initiate efforts of combating childhood obesity, poor nutrition, and physical inactivity (Food and Nutrition Services, 2010). That same year, Buckeye School District received a \$50,000 grant to improve wellness efforts within the school. The creation of the school's wellness team was established to help allocate the grant money to all aspects of school wellness. Projects that benefited from the grant included a new walking path around the school, improved exercise equipment in the joint student/teacher workout facility, and the implementation of the schoolyard garden project. Efforts to initiate the garden project were improved by the creation of a partnership with the Sustainable Food Initiatives Organization.

### Buckeye Elementary School

Farming accounts for 18% of Pawpaw County's land use (Ohio.gov, 2000). Agriculture, especially small, no pesticide, and organic farms, are especially appreciated in the Pawpaw community. The local Farmers Market, which operates year round, is the largest open-air market in the state. The Farmers Market sells seasonal vegetables, fruits, and herbs, along with baked goods, meat, flowers and plants. Two unique market stands include Wish Gardens kid's project, and the Donation Station. Wish Drive Apartments, a HUD housing unit, in collaboration with

Sustainable Food Practice, created a large garden to educate the children living in the apartments about growing and harvesting fresh food. Volunteers helped the children grow the food and sell it at the farmers market. Profits from the sales have gone towards purchasing garden equipment and additional seeds to expand production. The Donation Station, a project supported by Sustainable Food Practice, allows for area residents and vendors to buy or donate produce that will be given to area food pantries and soup kitchens. These programs show the willingness of Pawpaw county residents to support the growing trend of providing fresh produce to citizens most vulnerable to the effects of poverty.

Buckeye School District has many factors working in its favor to create a school garden effective enough to encompass many types of uses. Buckeye is a close knit community with significant ties to its school. The Buckeye School District consists of one elementary, one junior high, and one high school. Some students and their families rely heavily on the school's support of certain nutritional and supplemental programs which are provided by the federal government and private donations. These include programs that account for the poverty and limited access to quality food, and the many students who require additional services to create successful learning.

The Backpack program was another example of one such nutritional program. It was funded by a non-profit organization, and designed to provide students *who qualify* with supplemental food during the weekend (Feeding America, 2011). Every Friday, volunteers from the organization gave each registered child two days of breakfast and lunch, and food for other children who also lived in the home. Unfortunately, in order to account for the lack of accessibility students and families may have to electricity and stoves, the food consisted of low nutritional content, pre-packaged items. If the Backpack program include produce from the school's garden it would better met the nutritional needs of the participants, and also could

potentially have cut costs in its operation and expanded its services to include more participants, including providing food for students during the summer months and school vacations.

Another community program benefiting Buckeye School District was SeniorCorps, a government affiliated program, which provides citizens 55 years and older an opportunity to volunteer their time and service to area residents. In conjunction with an Appalachian Development Project, SeniorCorps matches senior citizens with opportunities to use their knowledge and skills to benefit others. Many members get placed in schools, repairing houses, or providing companionship to residents unable to function with day-to-day tasks (SeniorCorps, 2010). The SeniorCorps program used most at Buckeye Elementary School was the Foster Grandparent program, which matched SeniorCorps members with students might have benefited from supplemental services. The success of the Foster Grandparent program could have opened the door to other SeniorCorps programs that can be used to assist in the implementation of the garden project at Buckeye Elementary, such as RSVP; a SeniorCorps program that matches volunteers with specific skills they possess, which may include gardening (SeniorCorps, 2011).

### *Analysis*

Buckeye School District's School Wellness Policy was implemented by the School's Wellness Committee, a group of teachers, administrators, and community members. The committee's structure included a President, Vice-President, Secretary, Treasurer, and committee members. The committee met once each month to discuss the current status on projects already initiated and future goals its members would like to see implemented.

During the project, the committee's major responsibility was to divide money from Sustainable Food Practice's edible schoolyard grant and another school wellness grant among various projects. Allocating the money fairly and proportionately to the needs of the school or a

particular program proved to be the committee's largest hurdle. Membership and interest level among the staff of Buckeye School District was another issue. Although school employees appreciated the idea of having a wellness policy and Wellness committee there was little support offered in the area of collaboration. Also, although the team had good intentions, its members had varying levels of aptitude in the area of school wellness, which created a distance between certain committee objectives and the implementation of projects, including the school garden. Although school wellness policies are required in most schools, it appears there was a lack of support. This also was reported in a California-based study that looked at perceptions and barriers of school wellness policies. The results suggested that wellness committees could be more beneficial if there were a coordinator at each school who was dedicated to guiding initiatives necessary for complying with federal mandates (Agron, Berends, Ellis, Gonzalez., 2010).

Buckeye School District had many resources in place to implement a successful garden project. Its close proximity to two neighboring school districts that had already developed agriculture projects on school grounds became a catalyst for Buckeye's own aspirations; one high school built a greenhouse and an elementary school, working in conjunction with SFP, established an edible schoolyard garden. SFP's mission for collaborating with Buckeye School District's school garden was to teach the school's staff and network of volunteers how to create a garden plot, how to effectively grow a variety of produce, and help establish a curriculum component that would bridge the benefits of gardening in alignment with required Ohio Academic Content Standards. Also, the school campus was located on a sprawling flatland, a perfect site for accommodating a garden space.

### Summary

This Master's Research Project was conducted on a small scale (Israel, 2009), with a homogenous group of participants, i.e. elementary teachers at one school. The findings in this chapter were based on the views and opinions of the respondents in this study, which makes it difficult to draw explicit conclusions in comparison to other similar research studies. Bassey (1999) calls the assumption of comparable results within studies, "fuzzy generalizations." However, he adds on to say that, "...something that has happened in one place...may happen elsewhere. There is possibility but no surety" (p. 52).

CHAPTER FIVE:  
SUMMARY, CONCLUSION and RECOMMENDATIONS

Summary

The participants in this study included 15 Buckeye Elementary School teachers who each completed a questionnaire. They also included four participants who participated in an interview. These interviewees included a first grade teacher who was not a part of the school's Wellness Committee, a Wellness Committee co-chair, the school nurse, and the school's AmeriCorps member. The questionnaire was an anonymous instrument consisting of 10 open-ended questions with varying subject matter; including their classroom demographics, their gardening experiences, and feelings about the garden project. The interview questions consisted of six open-ended questions asking the participants to describe their thoughts about the garden and its use within the school and community as well as the challenges the garden project might encounter.

The purpose of this study was to examine the benefits of implementing a garden within the confines of a school setting. A review of the research concluded that school gardens can have a positive impact on student learning by integrating a more experience-based curriculum, and by fostering a greater variety of intelligences. School gardens can also provide students with more accessibility to fresh produce, while simultaneously creating a partnership with the community.

The findings of this research project revealed teacher and staff insights about their students and how a garden would benefit the school. Some findings included teachers describing many of their students as hands-on learners, and that they are motivated by rewards. Findings also suggested school gardens can be a way to enhance learning of specific content, such as

science, and to teach more practical skills such as growing and selling food. Interestingly, most participants in the study currently had a garden or had had a garden previously, which suggested a greater willingness to involve their classes in the garden project. Also, the study found the teachers and staff enthusiastic about involving the community. They suggested selling produce at the Farmers Market, donating produce to the community, and allowing the community to use the garden during the summer months.

Based on a reviewing of the research literature and the answers provided by the participants, the findings suggest that meaningful learning for students is created by providing opportunities to learn in a hands-on, experience-based environment that is relevant to their lives. School gardens are one way to provide a meaningful learning experience. School gardens can offer students experiences to learn specific content, such as the plant cycle, and insect identification. Furthermore, school gardens can also teach students how to grow and sell their produce within a market economy. This type of real-life approach to learning can greatly increase a student's ability to comprehend and retain knowledge.

Teachers and staff members at Buckeye Elementary were overwhelmingly excited about the garden project at their school. The participants in this study expressed a desire to provide an alternative approach to learning for their students, and were encouraged by the garden project's ability to meet the needs of their students. Some teachers and staff members suggested the need for the school to provide more direction on how to implement a curriculum that includes using a garden, and how to align the garden with the state-mandated curriculum standards. The findings in this study suggest that school gardens can heighten student learning, especially when teachers and staff are encouraged to participate in workshops and programs that develop a greater level of content knowledge, and help them foster pedagogical approaches towards experiential learning.

School gardens provide an alternative approach to teaching content, while also helping students learn life-long skills. School gardens encourage students to become engaged by providing an experiential, hands-on approach to learning. They help create a more purposeful relationship between a school and the community, and promote a positive approach towards more healthy eating habits. The findings of this study suggest Buckeye Elementary teachers and staff believed the school garden would enhance the quality of their school community and student learning.

### Conclusion

In 1996, Mabie and Baker assessed two separate 10-week experiential education projects at a Los Angeles middle school science class, i.e. a school garden project, and in-class projects focused on seed starting, chick rearing, and bread baking. During the study they designated two groups of students; one group participated in the projects and the other group was taught using classroom lecture and in-class work. When qualitative results were compared using the pretest and posttest assessments, the group participating in the projects dramatically improved its observational, ordering, comparison, and communication science processing skills. The conclusions of this study help justify the importance of gardens in a school environment, and the positive impact experiential learning has on students' higher order thinking skills.

As trends in educational reform evolve, so must our practices in teaching. This includes providing supplemental opportunities for students who seek a hands-on approach to learning. To develop a successful experiential education model, such as a school garden, certain characteristics of the school district, staff, and community must be identified.

The school district needs to possess a motivation to implement an experiential education program. Although research underscores the benefits of these types of programs, it would be

naïve to think school districts would consider its implementation without having an extrinsic stake in its existence. A school garden must be beneficial to the school district in some manner, which can include the ability to supplement the school lunch program, sell produce to the community, or even fulfilling certain grant requirements.

Because of current educational budget constraints, field trips and other out-of-school excursions have become limited, i.e. regardless of their ability to support meaningful learning (Pace & Tesi, 2004). This may cause schools to employ informal field trips, such as visiting local natural and historical sites, or area businesses. School districts should rely more on their ability to create a meaningful experience without having to leave the school grounds. By establishing a school garden, schools can give their students a unique opportunity to learn beyond the walls of the classroom while at the same time saving and possibly generating revenue.

Another consideration must be given to the teachers at the school. Although a school district may find a school garden beneficial, it will be the teachers who must decide how to best incorporate it into their curriculum. In 2009, the Metlife Foundation published the results of a survey of over 1,000 American teachers, highlighting their views on many educational issues; including listening to teachers' perspectives. Of the over 1,000 teachers surveyed, an astounding 69% of educators indicated their voices were not heard by their administrators (Metlife, 2009). The success of a student depends on the effectiveness of the teacher. If a teacher feels *forced* into a curriculum or decision without given the opportunity to collaborate or be heard, it may cause the project to have an untimely end. Including teachers and staff in the process will lead to a more successful school garden project.

At the time of writing this Master's Research Project, the garden project at Buckeye School District was still evolving. The reality of its existence rests on the ability to establish a goal-oriented timeline of completion and implementation. For this to happen, a stronger level of advocacy for the garden and future wellness projects needs be created. In order for the garden to be realized sooner, the district must appreciate its current resources. The high school has a shop class with machinery and tools capable of constructing the necessary structures; such as a tool shed, fences, and stakes needed to support some of the produce. The district is in close proximity with two colleges, both which have degree programs including an environmental studies focus, along with a supportive community centered on the services the school provides.

#### Recommendations

Unfortunately, there exists no extensive long-term research on the effects of school gardens. There is limited research on how school gardens can enhance student learning, effect a community, or help create healthier eating habits for students. In order to validate the effectiveness of school gardens, recommendations for further research include following multiple school gardens and their progression while focusing research on trends informed by standardized test scores, overall student achievement, teacher and staff satisfaction, and the overall health of the community.

Furthermore, recommendations for a school interested in implementing a garden would be to encourage participation by staff and community to participate in the planning, execution, and maintenance of the garden. Finally, school should also include availing themselves of community resources including local farmers markets, colleges, and government programs. Having multiple stakeholders in a school garden project can help create a partnership that is meaningful for all involved.



8. In what ways would it be difficult to adapt a garden into the curriculum?
  
9. How often do you think you would use the garden?
  
10. Do you feel a garden project at Buckeye Elementary School is feasible, Yes or No and why?

APPENDIX B:  
INTERVIEW QUESTIONS

1. What feelings did you have during the initial garden project?
2. What challenges arose during your role?
3. How do you see the garden project working within the school?
4. How would you like to involve the community?
5. Do you think fresh food from the garden can be implemented in the school?
6. In what way can the garden “grow”?

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