THE EFFECTS OF SCHOOL GARDENS ON CHILDHOOD EDUCATION AND
WELL-BEING

by

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CHAPTER I
INTRODUCTION

A school garden is an actual garden that has been implemented at a school for use in regards mainly for educational purposes. School gardens are known to connect kids with the natural world by offering a hands-on approach to learning. They are also found to enhance the growing and the well-being of many children and communities. School gardens typically will cover a variety of subjects in schools. They encourage healthy habits, educate children, and offer the school fresh produce.

The importance of school gardens has been reflected in the little empirical evidence found. Most of the research on school gardens is anecdotal, but this evidence has high rates of positive outcomes and feedback from those who have experienced working with school gardens first hand. The research has shown that school gardens enhance students’ learning and environment by incorporating a hands-on approach to experiential learning. Many of the experiences were found to be purposeful and pose an impact on the students, personally and educationally (Skelly & Bradley, 2000).

There were many benefits associated with school gardens, and the evidence is outlined throughout various key studies presented in this paper. There was significant research that suggested many of the benefits of school gardens to childhood education and well-being. Some of the major findings from Alexander, Hendren, & North (1995) presented the idea of gained pleasure from children’s gardening experiences and enhanced relationships that were built. Bradley, Waliczek, & Zajicek (2001) developed research proving the effects of school gardens on children’s interpersonal relationships and attitudes towards school and found that the gardening experience had a greater
impact on females and depended on the grade level of the students. Ozer (2007) outlined the improved knowledge and attitudes towards fruits and vegetables, and increased likelihood to taste and consume more vegetables. Ratcliffe, Merrigan, Rogers, & Goldberg (2011) found that school gardens could have an impact on children’s knowledge of various vegetables, the consumption of them, as well as more positive attitudes towards vegetables. One last key study used to develop this research paper from Smith & Motsenbocker (2015) found that there were improved science test scores as a result of engaging in school garden programs.

The main focus of school gardens has been to teach students about science and basic gardening and agricultural skills, but various other skills apply and are incorporated. School gardens are widely utilized and of interest in the recent years, but they are lacking in supporting up-to-date research. However, the consistent research found has proven many positive points about school gardens. The purpose of this paper is to examine how school gardens affect childhood education and well-being.
CHAPTER II

REVIEW OF LITERATURE

History of School Gardens

The history of school gardens, specifically in the United States, dates back to the late 1800’s and into the early 1900’s. In 1905, Fannie Griscom Parsons initiated the school garden movement by supporting the first organization sponsoring school gardens. The goals initially were to help children earn money to support their families with inter-city flower and vegetable gardens. There were others like Parsons who worked to create a public awareness about the nature of school gardens, and eventually the federal government who decided to support school gardens in 1915 viewed their efforts. Soon after Parson’s efforts, the purposes of the gardens shifted at the beginning of World War I when the School Garden Army pushed to increase food production for war efforts (Trelstad, 1997).

According to Trelstad (1997), the goals of the gardens from 1915-1919 were to educate children about conservation and agriculture, to sell the crops produced, to bring rural elements into the city life, and to help educate immigrants of the values involved in being an American citizen. The Nature Study Movement, led by Liberty Hyde Bailey, was the initial organization to encourage using the environment to aid in education, to praise a rural lifestyle, and to make this lifestyle accessible to urban children needing to learn more about the natural world.

In the early 20th century, when progressive reform was in full swing, school garden ideologies shifted towards economic and industrial values versus the previous educational and nature-centered purposes. Prior to World War I, there were major shifts
socially and economically, which made people realize that school gardens could be irrelevant and unnecessary. There were various explanations as to why school gardens drastically began to decline during this time. One of these reasons was because of the decrease in immigrant children, who were the major source of labor in the gardens. Another reason was because of the introduction of the Boy Scouts and Girl Scouts Organizations, who attracted the main participants of school gardens. These two newly founded organizations were too much competition for school gardens. Lastly, there were major improvements and growth in inner-city lifestyle and soon school gardens became home gardens. Resultantly, the uses and needs for school gardens ebbed and flowed with the dynamics of the history of our nation. From past to present, change continued to challenge the existence of school gardens (Trelstad, 1997).

**Today: Facilitators, Funding, and Barriers**

The focus of school gardens today has moved towards efforts to control the elevated obesity rates and to promote health and well-being in cooperation with education to school-aged children. Ozer’s research (2007) focused on the use of the ecological theory and was mostly compiled of anecdotal evidence and peer-reviewed research from four different studies. The many members who support the gardens’ various causes have made school gardens possible. The major facilitators were faculty, staff, parents, students, community members, volunteers, and nonprofit organizations. Ozer explained why it has been imperative to have many supporters of a school garden in order to keep them up and running strong, and the collaboration of these supporters was essential to maintain and utilize the gardens in a beneficial manner. One of the biggest barriers was not having enough experienced volunteers or the managers of the gardens not having
enough time to tend to the needs of a garden. A lot of schools also may not have had appropriate funding on their own to provide necessities like a space for a garden, or seeds, tools, and equipment. The funding of school gardens was often done either through donations or via various grant programs that schools and teachers had the opportunity to apply and be eligible for. Searching for grants however presented to be extensive work that could have discouraged schools from obtaining school gardens in the first place. Other likely barriers were not having ample space at a particular school for a garden and the extensive planning process of getting a garden.

According to Dyment (2005), there were five major barriers in creating and maintaining green school grounds as a use for outdoor learning. These barriers are similar to those noted by Ozer (2007) and included: lack of experience and knowledge among teachers or volunteers, and lack of time, space, and resources. Dyment (2005) also suggested that there were concerns about liability issues with children working in gardens and implied that there were also larger issues regarding the way school gardens fit into the education system, specifically fitting into the various school curriculums. There were many barriers to organizing, utilizing, and maintaining school gardens. Both Ozer’s (2007) and Dyment’s (2005) articles pointed out the importance of overcoming these barriers so that children may have access to school gardens in order to utilize the various benefits they can provide.

**Benefits of School Gardens**

Even though there are barriers to school gardens, there have also been many benefits found. The purpose of Ozer’s (2007) research was to determine the effects of school garden programs on students’ physical and mental health as well as to explore the effects
of garden programs on students’ academics. There were five research studies compiled in Ozer’s article based on peer reviewed research and supporting evidence, including subjects ranging from first through eighth grade. The first study included four separate studies of 200 fourth grade students and found an improved knowledge towards vegetables with a nutrition education program implemented in the school garden curriculum. The second study was a small pilot study of 97 first graders and identified that with school gardens the kids were more likely and willing to try vegetables. The third study included in Ozer’s research was a pre/post-designed study of 111 third and fifth grade students. The study concluded that when garden nutrition education was implemented there were improved attitudes and behaviors about eating fruits and vegetables. The fourth study included 338 second graders and found that there was an increased intake of fruits and vegetables with the garden program. Lastly, as a part of Ozer’s research there was a fifth study of an experiment involving 598 second through eighth graders. This experiment found that there were more positive effects on just the females in the study, but not the males. There were various rewarding social benefits also found as well as enhanced school environments. The main conclusions from Ozer and from these different studies were improved knowledge and understanding about vegetables, students’ willingness to taste various vegetables, along with students having developed more positive mindsets towards fruits and vegetables.

Alexander et al. (1995) also found many benefits associated with the effects of school gardens on children. This study was centered on school gardens, horticulture, personal development, youth engagement, education, and relationships. There were 52 subjects from third through fifth grade from an inner-city school in San Antonio,
Texas. The methodology used in Alexander’s study was qualitative interviews. The results indicated that there was gained pleasure associated with the students who participated in the school garden project. There was also an increased interaction and improved relationships among many of the students and the adults and/or parents. Lastly, this study found that the students grew to appreciate and value their school garden. Because of all the work they put into the gardens, they were able to not only learn about science and gardening, but about themselves as well.

There was a separate study compiled by engaging, questioning, and testing 320 sixth-grade students aged 11-13 years old in San Francisco, California targeting more specifically those of low-income, racially and ethnically diverse backgrounds. The purpose of the study was to evaluate the effects of school gardens on students’ knowledge, attitude, and behavior towards vegetable consumption. By utilizing a vegetable frequency questionnaire on the participants, the results showed improved levels of understanding and knowledge associated with vegetables, as well as enhanced attitudes and behaviors towards vegetable consumption after the children took part in a school garden experience (Ratcliffe et al., 2011).

Lastly, Bradley et al. (2001) conducted a study in 1995-1996 in Texas and Kansas at seven different schools. There were 598 student subjects ranging from second grade to eighth grade. The purpose of this study was to examine the effects of school gardens on children’s interpersonal relationships and attitudes towards school. Bradley used a control and experimental group, and the results of the study found that females had more positive attitudes towards school following their school garden experience as compared to the males. The study also found that the results were dependent on grade
level. Seventh graders saw the greatest effects and academic improvements when compared with all other school grades.

**Effects of School Gardens Related to Education**

While there are wide-ranged benefits found from these various articles, more research comments specifically on the effects of school gardens regarding childhood education. Referring back to Ozer (2007), it was found that school gardens cover a wide scope of subjects such as: science, math, nutrition, and health. Improvements in academics were proven through Ozer’s findings from the evidence provided from school leaders in various subjects. There was also an improved knowledge of food in general, specifically fruits and vegetables and an increased understanding of nutrition.

There were also improved attitudes and behaviors towards school following students’ experiences in school garden programs. The findings were also dependent on grade level, specifically seventh graders were found to have greater effects from school gardens. This research not only identifies some of the many benefits and effects on education regarding school gardens, but also states the various psychological benefits that gardens had on students (Bradley et al., 2001).

Smith et al. (2015) focused specifically on the impacts of hands-on science to elementary level students. The study focused on three elementary schools in Baton Rouge, Louisiana who spent class time in the gardens once a week for two hours each class session. The methodology used was sourced from a science-based pretest and posttest to determine whether or not being involved in the school garden had an impact on the student's knowledge of science. The results found that the fifth-grade students’
science test scores significantly improved after engaging in school gardens once per week for two hours.

In a final look at research regarding the effects of school gardens specifically on education, Williams & Dixon (2013) did a study with a purpose of finding the impact of school gardens on academic outcomes. This research was compiled based on twelve different studies, and the results found improved academic results. Williams et al. found advanced science scores among all types of students from these various studies who took part in school gardening. There was an improved cognitive function as a result from working in the gardens and being in direct contact with the land and nature. Williams et al. identifies a link between student engagement and how school gardens have a strong correlation with a real world application for the students. This study also found improved attitudes and behaviors towards fruits and vegetables.
CHAPTER III
DISCUSSION

Throughout the course of doing research on the effects of school gardens on childhood education and well-being, there was a plethora of anecdotal evidence supporting the many benefits of school gardens, but little empirical literature to match those results. Most of the articles mentioned a lack of research and suggested that further studies should be done regarding this topic to support many of the results expressed throughout this paper. This section will include the interpretation of the research in Chapter II and further discuss some of the various studies on the effects of school gardens on childhood education and well-being.

Both Bradley et al. (2001) and Ozer (2007) found that gender, grade, and specific school were all major influential factors of the effects of school gardens on childhood education. Regarding gender, they both found that many of the positive effects of school gardens on children were significantly more prevalent in females versus males. Specifically, there were more significant positive attitudes by females toward school after the garden curriculum and program was utilized. The garden program that Bradley et al. (2001) and Ozer (2007) used was made intentionally to be unbiased towards gender, compared to traditional programs that tended to be more stereotypical towards males. In these instances, females would feel more drawn away because the language and process of how school gardens were implemented and used was more directed towards males. Specifically in Bradley et al. (2001) and Ozer’s (2007) studies, they helped to eliminate this stereotyping which resultanty affected the females in a positive way. Bradley et al. (2001) and Ozer (2007) helped conclude the reasoning of
females having more of an effect from school gardens due to a strong effort to eliminate stereotypical behavior. Both Bradley et al. (2001) and Ozer’s (2007) research was sourced from the same study and also offered the only evidence suggesting that gender played a role in the effects of school gardens on childhood education, which could identify this piece of information as irrelevant. These studies also found that the interpersonal relationships developed as a result of working with school gardens were dependent on grade level. The greatest impact of the programs was seen in seventh graders, ages 12 to 13 years. The articles suggest that this could have been because the students had the convenience to work more independently as compared to younger participants, therefore having a greater opportunity to socialize and communicate with others throughout the garden program. The communication that the older students experienced resulted in more positive effects from the school gardens. Lastly, the specific school the students attended played a role in the results as well. The schools that allowed more independent work in the gardens saw greater positive impacts among students as compared to those schools that did not offer that experience. The effects of gender, grade, and specific school are interesting from this specific study, but the research as a whole did not have further evidence to back the fact that these three factors or variables played a significant role in the effects of school gardens on childhood education.

When comparing research articles from Bradley et al. (2001) to Alexander et al. (1995), the results they found were about social, personal, and mental health aspects that drew an interesting angle when looking at the various effects of school gardens on children. They both found an angle of how factors such as relationships and pleasure
were impacted from the children’s experiences. Schools can have an effect on more than just students’ education, but also on their overall physical, mental health, and well-being. It was easy to connect the various positive effects and testimonies of school gardens to the six dimensions of wellness: physical, emotional, social, intellectual, spiritual, and occupational (National Wellness Institute, 2015). From the physical dimension, the children acquired some physical exercise and movement while working in the gardens (Ozer, 2007). Emotionally, children were affected by having an increased amount of pleasure and happiness associated with engaging in a garden program (Alexander et al., 1995). As mentioned above, Bradley et al. (2001) and Alexander et al. (1995) found that school gardens affected interpersonal relationships, which are a major factor in the social dimension of wellness. Intellectually, kids learned various subjects and life skills while being a part of a school garden (Williams et al., 2013). Gardening proved to also involve a spirituality aspect, such as reducing stress, according to Unruh (2011). Lastly, school gardens were shown to possibly impact children’s futures, which can tie into the occupational dimension of wellness. Students learn many skills and increase their knowledge, which makes them better prepared to find a job when they eventually reach the level of the occupational dimension. Most of the research correlates with the seven dimensions of wellness and help prove the association to the positive effects of school gardens.

There is also a connection between the uses of anecdotal evidence as it relates to the way the topic of this paper is researched. It seems to be challenging to scientifically measure the effects of school gardens on childhood education by doing studies testing factors like happiness, spirituality, and interpersonal relationships. Anecdotal research
and evidence seems to be the best way to measure these types of situations and topics, because it would be a challenge to measure something like level of happiness with scientific tests and analysis. The research for this topic works best with the use of interviews, personal experiences and backed opinions. The downside to this type of evidence is that it does not rely on scientific method and can become biased at times. Although it may not provide the most precise scientific research, anecdotal methods are useful and help support further research and evidence and are the best method of research when looking at topics such as the effects of school gardens on children and their overall well-being.

Smith et al. (2015), Ratcliffe et al. (2011), and Alexander et al. (1995) all specifically identified the subjects of their studies, and there was somewhat of a pattern of garden programs involving specifically minority or disadvantaged participants. They all had some patterns when looking at race, ethnicity, cultural competency, and socioeconomic status. Smith et al. (2015) had a population that consisted of a low income, disadvantaged African-American population from inner-city public schools. Ratcliffe et al. (2011) had a population consisting of children from low-income urban communities, with 90% of them being of color and 64% from low-income households. Alexander et al. (1995) included a population of inner-city youth consisting of 70% Hispanic, many from single parent homes. Inner-city, disadvantaged environments such as these offered fewer opportunities for children to learn about the natural world, and school gardens have shown to create an experience for these types of students that proved to have positive effects on them. The possible reasoning behind these demographic factors could imply that students in more diverse, disadvantaged
environments posed greater effectiveness towards integrating and utilizing school gardens within education systems. It seems, therefore, that race, ethnicity, culture, and socioeconomic status all impacted the effects of school gardens on childhood education.

Lastly, the research suggested that there were only positive effects of school gardens on childhood education and well-being. After looking at the key studies and research articles, the data proposed that there were no negative effects proven. There were some barriers involved with school gardens, but the research suggested that there were no direct negative effects to children, school districts, and communities.
CHAPTER IV
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

In conclusion, the purpose of this paper was to examine how school gardens affected childhood education and well-being. This paper outlined the basic research studies about school gardens and established that there were positive impacts on children. Although there was little previous research done on this topic, sufficient information was found to support the efficacy of the effects of school gardens on education.

There were some common themes and main conclusions through exploring the effects of school gardens on childhood education. The key research studies explained that there was an improved knowledge and understanding about various vegetables and an increased willingness to taste different vegetables as a result of children engaging in school garden programs (Ozer, 2007; Ratcliffe et al., 2011). Students also developed more positive mindsets towards the consumption of various fruits and vegetables (Ozer, 2007). Additionally, the integration of school gardens resulted in improved academic test scores as a result of student engagement in school gardens (Smith et al., 2015; Williams, 2013). The research also demonstrated that there was gained pleasure and a sense of value among students that had participated in garden programs, as well as an increased social interaction of those same students (Alexander, 1995). Lastly, school gardens were found to affect students’ interpersonal relationships, and these effects were dependent on factors of grade, gender, and specific school (Bradley et al., 2001). Together the findings presented by these key studies supported the idea that school gardens had positive effects on childhood education and well-being.
Based on the interpretation of the research, there were a few more specific themes addressed separately from those drawn above. The research concluded that the effects of school gardens were found to be more prevalent in females as compared to males, and that interpersonal relationships were dependent on grade level. Also, the idea that gender, grade, and specific school were three major factors that influenced the results of the effectiveness of school gardens on childhood education (Bradley et al., 2001; Ozer, 2007). Lastly, the research suggested patterns of the effects of school gardens being influenced by race, ethnicity, culture, and socioeconomic status (Smith et al., 2015; Ratcliffe et al., 2011; Alexander et al., 1995).

It is suggested that further research be conducted on the effects of school gardens on education using more complex strategies and larger sample sizes. The small amount of research and anecdotal evidence found is very encouraging, but there is a gap between the research and the conclusions found. In conclusion, it appears that there are many and mostly positive effects of school gardens on childhood education and well-being. These effects included a wide range of physical, emotional, social, intellectual, spiritual, and occupational benefits (National Wellness Institute, 2015).
References


