Master Gardener Classroom Garden Project: An Evaluation of the Benefits to Children

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Abstract

The Master Gardener Classroom Garden Project provides many inner-city children in the San Antonio Independent School District with an experiential way of learning about horticulture, gardening, themselves, and their relationships with their peers. To evaluate the benefits of participation in the Classroom Garden Project, data was collected on 52 second and third grade students. Qualitative interviews indicate that participation in the gardening project has had many positive effects on the school children. The children have gained pleasure from watching the products of their labor flourish, and have had the chance to increase interactions with their parents and other adults. In addition, the children have learned the anger and frustration that occur when things of value are harmed out of neglect or violence.

Keywords: classroom gardens, inner-city children, evaluation, horticulture

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Introduction

Gangs, drive-by shootings, family problems, poverty, and chaos are the daily fare of many minority, at-risk, inner-city children. These experiences shape their impressions of growing up in America today. Action groups and civic-minded individuals express concern for tomorrow's children, and yet solutions to these problems are elusive and complicated, as the problems seem to be so deeply rooted and resistant to change.

If young inner-city lives have been scarred by fear, uncertainty, and unpredictability, what might be done to change things? Is there a way to introduce positive values and expose these children to healthy role models? What might enhance their self-esteem and help them develop a regard for life and nature? One part of the answer may be as simple as a hands-on learning experience: gardening at school.

Most people would agree that participation in a classroom garden is a “good thing” for inner-city children. Benefits may include increased motivation to come to school each day for the experience of planting, caring for, and gathering the produce. Joining in a cooperative effort and working toward a common goal may play a part in fostering independence and a sense of community. Self-esteem may be enhanced through nurturing plants and learning simple tasks that promote an appreciation of growing things. Anxiety arising from living in dangerous neighborhoods may decrease when children have, however temporarily, a sense of control over their environment, as they would in a garden project.

Maria Montessori (1870-1952) was one of the first educators to recognize that children are experiential learners. She created specific environments where children could construct their own knowledge, places later referred to as child-centered classrooms. Her systematic, creative work with children in poor neighborhoods of Rome, Italy, not only met its original purpose (preventing vandalism), but additionally had the unanticipated effect of transforming the children into avid learners (Montessori, 1912). From her work with inner-city children in Rome, Montessori came to believe that teaching children to work in gardens would lead them to contemplate nature intelligently, and to moral education. She wrote of English educators, also, who believed that children’s participation in gardens fostered the “first notions of household life” (Montessori 1912, 155).

Following Montessori’s model, the Bexar County Master Gardeners have taken steps to bring about positive change in the lives of San Antonio’s inner-city children. Bexar County Master Gardeners is a non-profit corporation in the San Antonio area. Its 300 members receive special training for the Texas Agricultural Extension Service in horticulture in exchange for volunteer service. Individuals commit 50 hours per year of their time to address community priorities with their horticultural skills. The Master Gardeners’ (MG) Classroom Garden project in Bexar County Schools, Grades 1 through 5, was started in 1990 by Dr. Calvin Finch, Bexar County Extension Agent, and Paul Gates, third grade teacher, Madison Elementary School, San Antonio, in partnership with the San Antonio Independent School District (SAISD). By 1993, 105 schools were involved in the classroom gardening project.
62 of which were in SAISD. More than 10,000 children (70 percent minority) are involved in gardening each week. The Master Gardeners believe youth from all economic and cultural situations benefit from exposure to gardening instruction. One of their objectives is to have classroom gardens in every elementary school. The gardens have been popular and the project participation has grown dramatically in the three years since its inception. However, there has been no evaluation of the short term impacts (if any) on the participating children. The objectives of this pilot study were therefore to identify the effects on school children participating in classroom gardens, report these findings, and make suggestions for future evaluative research in this area.

**Methodology**
The research design incorporates triangulation across:

1. Data sources: interviews with children, parents, teachers, a Master Gardener, and the school principal.
2. Investigators: Two persons conducting interviews, making observations, and analyzing data.
3. Data collection techniques: interviews and observation.
4. Qualitative data analysis techniques.

**Participants**
The subjects consisted of students (n = 52), teachers (n = 5), parents (n = 3) and the principal of one participating Elementary School in San Antonio, Texas. Five second and third grade classes were used for data collection. Three of the classes (one second grade and two third grade) were involved with the classroom gardening. The remaining two classes were non-gardening controls. Subjects took part in the study during the normally scheduled school day. The students were representative of “inner-city youth.” Most (70 percent) were Hispanic, many from single parent homes.

**Measures**

**Interviews**
Most of the interviews were conducted on site at the elementary school in San Antonio, Texas. The following individuals were interviewed:

1. the teacher who first started the classroom gardens project;
2. the principal;
3. four teachers whose classroom children were involved in the study;
4. two parents;
5. school children in the second and third grades who had been previously or were just beginning to participate in the garden project;
6. a Master Gardener who assisted two of the teachers in starting gardens during the study; and
7. a teacher from another school who had had problems with a gardening project in her classroom.
The adults were interviewed individually, with the exception of one parent who was interviewed in one of the group interviews with children. All of the children were interviewed in groups of 10 to 15. The teacher from another school was interviewed by phone.

**Figure 1. An illustration provided by an eight-year-old gardening student.**

A brief, structured interview schedule was developed for the study. Generally, the same questions were covered with all participants, in approximately the same order. Questions were open-ended, and consisted of the following inquiries:
1. To adults: What are the effects [of gardening] on the children?
2. To adults: What are the changes you've noticed in the children?
3. To children and adults: What are the good things about the gardens?
4. To children and adults: What are the bad things about the gardens?

**Analysis**

The method of analysis was the constant comparative method, designed for studies where there are multiple sources of data (Glaser and Strauss 1967; Glaser 1978). The interviews conducted with the participants were videotaped, transcribed, and evaluated for emerging themes. Because every data source (teachers, parents, children) was considered as a separate data source, multiple comparisons were possible.
Results

Interview Data
The six themes which emerged from multiple interviews with teachers, children, parents, the principal, and the Master Gardener were:
1. moral development;
2. academic learning;
3. parent/child/community interaction;
4. pleasant experiences;
5. the influence of the Master Gardener; and
6. perceived problems.

Moral development
Children in the garden project appeared to have many opportunities to learn valuable lessons about life: delayed gratification, independence, cooperation, self esteem, enthusiasm/anticipation, nurturing living things, motivation, pride in their activities, and exposure to role models from different walks of life. Teachers, parents, and the children themselves had many things to say about these experiences.

Teacher 1:
*In the beginning there was a lot of resistance, they didn't want to plant something for somebody else...but these students are benefiting from what other... students have done... so they can see that makes sense... we'll start something we can't finish because somebody else started something and we get to finish that.*

Parent:
*My son’s really enthused about planting things and watching them grow and proceed as they grow and I see the energy from him and I wish we could do more of it.*

Child:
*It's fun to go out there and plant because like if you want to plant something, anything ... for your mom or for somebody, you can go plant it.*

Teacher 2:
*I hope they have respect for all growing things.*

Principal:
*It’s very motivating ... [they] make sure they have their assignments done so they can have enough time to go out and spend time learning in the garden.*

Teacher 1:
*I bring in a variety of people throughout the year to help with various facets of our garden ... Last week we had someone come in and show us how to prune our fruit trees and so they get all different kinds of role models...some*
people are perhaps more patient, some people are less patient....they realize that not all men are the same, not all women are the same, and they get to see people who are not teachers....

Children in the classroom gardens project have had what Montessori (1912) termed “moral education.” Their experiences have taught them respect for living things and how to cooperate with others (Sarver 1985; Montessori 1912; Cornell 1989). Tending their small plots has given them opportunities to find out what it means to care for and nurture living things, patience as they wait for things to grow, ways to delay gratification, and opportunities to let others have the pleasure of seeing things come to fruition. As Cavaliere (1987) wrote, children are motivated by gardening and place a high value on what they grow themselves. They also have the benefit of positive adult role models (Cornell 1989). Sarver (1985) mentioned another thing found in this study, namely that children develop a sense of order and structure and enjoy becoming agents of change- exactly as Teacher 1 described.

**Academic learning**

Paul Gates' (the third grade teacher) original concept involved “utilizing what was all around us but put it in a way that the kids would be able to understand” - using soil and seeds to give children hands-on experience with lesson about nature. But participants have found even more positives than that.

Teacher 1:

> My biggest reason is the academic end of it correlates to what I do in all of my subjects.

Principal:

> I think it gets them very eager about doing the garden because it is a different approach in a subject area that they’ve never done in that way before. I think they see lots of things growing in this garden that they don't ordinarily maybe see in the grocery store or maybe their mother doesn't buy it and bring it home.

Child:

> We studied about flowers and we dissected a morning lily... a day lily... there's a female part and a male part.

Child:

> We’ve learned how to put the plant in the soil ... how to plant seeds into the ground.

Montessori (1912) and Cornell (1989) believed that gardening leads children to the intelligent contemplation of nature, as well as an awareness of and appreciation for their environment. This is certainly borne out by our findings.

**Parent/ child/ community interaction**
Teachers reported that they had noticed parents' enthusiasm and support for classroom gardens. They also found that many children who began gardening at school soon had their families gardening, too. In addition, parents became more actively involved with school matters and their children's experiences at school. Children were found to have a sense of being part of a larger community, as they and their families found satisfaction from caring for gardens on weekends.

Teacher 1:
I'll have parents who put pressure on the office or ask in the office if they can have their child in my room because of our gardening project.

Parents have been real supportive of what we're doing. They realize that...this makes school fun... they'll tell me that never before has their child come home at the end of the day wanting to tell them every single thing that you plant and all the things they're doing.

It's something that the children and the parents can do together ... the way we started having parents volunteer was the kids asked if they can help in the construction of it in the beginning and I said, 'Well, I couldn't have them [the children] come over here by themselves' and they said, 'what if I brought my Mom and Dad?'

Anywhere from half to three-fourths of these students now have families that are gardening.

The kids were excited about the project and then the parents became excited ... we get parents helping and the kids pulling the parents into it because they're excited and the parents get excited.

Principal:
The parents ... seem very supportive of it. They think it's wonderful and they've always liked the idea of the children to have this garden to learn about.

Child:
I tell my mom, I tell her that maybe we could come water the garden so it won't die.

Parent:
It's a very interesting thing. It's nice for the school to take time and let these kids participate in something like this. A lot of us, when were going to school, we didn't have those kinds of opportunities ... instead of having some of these kids running around in the afternoon loose, that'll keep them occupied, you know, around the house with Momma and Daddy ... makes the house look pretty, too.

As this parent mentioned, and Montessori wrote (1912), gardening fosters children's “first notions of household life” (p. 155). By having an opportunity to
share their achievements with their families, children develop a sense of belonging and accomplishment that only experience can bring. Their “work” seems to bring them closer to their families, and their enthusiasm is catching, as was so poignantly described by the mother who commented on her sons’ enthusiasm and energy, saying “I wish we could do more of it.” Cavaliere (1987) commented that gardening's benefits spread to the families.

**Pleasant experiences**
Pleasure turned out to be a large part of the gardening experience. This came not only from tangible outcomes, but also from rewarding interactions with other gardeners.

Teacher 1:

*They get a lot of self-satisfaction from being able to start with just dirt and building forward to where they're able to eat what they harvest.*

*They're not dependent on Mom or Dad or Teacher to do something that comes out good and it makes them feel good.*

Child:

*But the fun part about the garden is that we get to try everything that we grow.*

Teacher 3:

*I love the garden. I think it's great and I think we've been having a lot of fun in there and it's a lot of hard work and we're praying that the onions will survive like the potatoes.*

Montessori (1912) commented on the pleasure children find in watching the beauty and variety of growing plants, and the rich rewards the plants provide. Everyone we talked to commented on the sheer pleasure the experience has brought to participants- getting hands in the dirt, watching things grow, the satisfaction of having successes. We had the privilege of being with one child when the first radish was harvested- a great moment for the child, for his class, for the Master Gardener (who was also present), and, surely that evening, for that child's family. It is wise to remember the importance of sheer enjoyment.

**Influence of Master Gardener**
An integral part of the Classroom Gardens project has been the guidance and support provided by Master Gardeners. In this study, both teachers and children commented on this aspect of the activity.

Teacher 1:

*And what they do is have a Master Gardener come out and help in planting which helps a beginning teacher, a beginning gardener, a lot. It's kind of overwhelming to have 22 kids all trying to plant at the same time. So for several years I had the benefit of a Master Gardener.*
As Cornell (1989) pointed out, gardening role models can make “ecological attitudes come alive” (p. 139). The Master Gardener we talked to also found considerable satisfaction from his part in the gardening project. He said he felt better about himself, and was proud to be able to give something back to the community by spending time with the children and helping them do something that was going to enrich their lives. He also enriched the teachers' experiences, as his wisdom and experience made participation more orderly and pleasant for them and their classes.

**Perceived problems**

We had to search hard for any negative experiences among participants. The comments were largely positive. In our questioning, when we asked what problems there had been, we found some interesting responses, especially in light of the scores on Perceived Personal Security subtest.

Teacher 1:

*One is time. You only have a certain number of hours in the school day. Doing gardening is time consuming.*

Principal:

*The only negative thing I could say perhaps would be that all the kids in the whole school don't get to do it.*

In our search for problems, we asked the Extension Office to let us know if there were any teachers who had stopped gardening after beginning a project. Surprisingly, the answer was no. But we did locate a teacher at a different school who had significantly changed her way of running her classroom garden. She had had a xeriscape garden. The groundskeeper at her school had mowed down the garden one weekend. She said her children were devastated. When asked why the plants had been cut down, the man said “They looked like weeds to me.” But the teacher and her children used this experience as a lesson in perseverance. They managed to get a fence erected around the garden and started over again.

At Madison School, destruction came in another form. This came out in interview with Teacher 1 and with the children.

Teacher 1:

*We have had vandals. Destroying our gardens? No. They have torn up timbers, they have picked plants, but that was mostly in the first year or so. In the summer ... we have summer school over here and we get kids in from other parts of San Antonio who are not familiar with the garden and then it feels like something they should be able to tear up.*

Teacher 1 has used this brush with vandalism as a learning experience, as did the teacher whose xeriscape was mowed down.
Teacher 1:

Most of the damage can be immediately repaired, if even needed. I mean, if they pull up a carrot there's really not a whole lot you can do. In most of the cases, like with the carrots, they needed thinning anyway and that was a valuable lesson for the children because many of these kids see vandalism all the time...and they were very hurt by it. It really offended them that these students had done this damage to their garden ... So then we talk about it and say, well, it made them feel very angry that these children had destroyed part of their garden ... it was a positive experience that the children learn that doing what to those children must have been a fun thing to do to go tear up our garden, didn't make us feel good. They were on the receiving end of it and so even though it was a negative experience you can make it a positive one.

Child:

We had other stuff but the fifth graders came and messed it up.

Child:

It's the fifth graders. They're always messing with our gardens.

Child:

They're always throwing trash, old pencils, like Christopher said, they tore up our garden. They even broke half of it. Now the dirt is all failing out.

Child:

We don't want any kids to come and mess up our garden.

Children also seemed very concerned that plants might die from lacking of watering, lack of fertilizer, or from environmental problems, such as “if the sun didn't come out.”

Child:

If there's no water they might just die out while they're still in the ground.

Discussion

The objectives of this study were to discover the effects of school children's participation in classroom gardens, report these effects, and make suggestions for future research on this topic. Data indicate that the garden has had many positive effects on the school children. The children have received lessons in moral development, have enhanced their daily academic curriculum, have gained pleasure from watching the products of their labor flourish, and have had the chance to increase interactions with their parents and other adults. In addition, the children have learned the value of living things, plus the anger and frustration that occurs when things of value are harmed out of neglect or violence.

Many of the assumptions proposed in the study were validated by the participants. It was assumed that because gardeners find enjoyment and considerable reward in gardening, it must be good for children. The parents, principal, gardening teachers,
and the children all responded with great pleasure and enjoyment regarding the gardens. The gardens are used as both a reward for hard work during the school day and also as a supplement to the curriculum. The children must learn to work as a team in order to complete all the necessary chores: weeding, watering, and fertilizing. They also learn the importance of nurturing and caring for the gardens. The children spoke of the need for water and sunlight and commented that without these important ingredients their plants would die.

When questioning the subjects on the problems with the gardens, they usually had difficulty responding. The majority of the children's comments revolved around the fear of vandalism and the safety of the gardens. The children spoke of the “fifth graders” and how they destroyed sections of the gardens. The children expressed their anger, frustration, and sad feelings. It is possible that the children are projecting on to the plants their own fears of safety.

**Recommendations for Future Research**

A proposed future study utilizing a longitudinal design will follow the same children as they progress through elementary school from third through fifth grade (8 to 11 years old). Also, enlarging the number of participants to approximately 300 over a three year period will enable quantitative as well as qualitative analyses. Self-esteem assessments will be included in the design to measure any changes in self-esteem secondary to participation in the garden study. Such a study is projected to begin in January of 1995.

**References**


