Horticultural Influences on Preschool-Aged Children's Peer Interaction and Task Engagement in an Inc.

Teri Rouse

Chestnut Hill College, Philadelphia, USA

There is great concern by teachers, school administrators, and parents regarding the increase in the number of preschool-aged students who exhibit challenging behavior in early childhood settings. A need for early intervention procedures that focus on young children who may be at risk for developing patterns of challenging behavior is evidenced. Research has also documented that early intervention programs, as well as complementary alternative therapies, have been successful in providing children with opportunities to develop age appropriate academic, physical, social, and behavioral skills. Complementary alternative therapies include art, music, movement, or horticultural activities. The activities suggested for this study incorporated the use of plants and/or plant materials in a variety of non-invasive activities that provided an opportunity for everyone in the class to participate. Twenty students and six adults from two preschool classrooms participated over a 16-week period. The researcher sought to uncover if horticultural activities would encourage task engagement. These activities were modeled by the researcher who was not a horticulture therapist. The results were promising. It was determined through the course of the study that task engagement and positive peer interactions increased after the implementation of the horticultural activities.

Keywords: horticulture, horticulture therapy, horticultural activities, school gardening, positive guidance, positive behavior support (PBS)

Introduction

There is nothing like watching children engaged in fun, dirty, and hands-on activities. Horticulture not only offers children the opportunity for many kinds of physical and mental activities, but also may foster an experience that can become a lifelong interest. As indicated by research, when students are truly engaged in an activity that is personally relevant, learning occurs (Smith & Motsenbocker, 2005).

When people think of horticulture, plants, trees, flowers, fruits, and vegetables possibly come to mind. Perhaps the act of gardening presents pleasant thoughts and images of beauty. However, horticulture is much more than tending plants and trees, gardens, and flowers. Researchers have suggested that horticultural activities have enabled individuals to clear their minds and calm their bodies (Hewson, 1994). Some suggest that horticulture therapy has helped some people increase their mobility, decrease their blood pressure, and for some, it has provided prevocational training that can now assist them in being proud, productive participants in society (American Horticultural Therapy Association (AHTA), 1999).

It has been implied that the utilization of horticultural activities has encouraged individuals' self-esteem

and social interaction (Hewson, 1994). There is research that supports using horticultural activities in children with disabilities (Ackley & Cole, 1987; Fabor-Taylor, Wiley, Kuo, & Sullivan, 2001; Hewson, 1994; Morgan, 1989; Relf & Dorn, 1995). Horticulture is a non-invasive form of therapy that provides an environment in which all individuals can participate. Horticultural activities use plants as a tool to heal or rehabilitate individuals who are sick or have disabilities (Flagler, 1993). The overall goal of therapy is to increase a patient's physical and mental wellness (Hewson, 1994; Relf, 1992). The goal of this study is to incorporate horticultural activities as a means to encourage increased task engagement and positive peer interactions.

It appears as though horticultural activities have had positive effects on individuals of all ethnicity, socio-economic situations, and religious backgrounds (Hewson, 1994; Relf & Dorn, 1995; Sempik, Aldridge, & Beckers, 2003). The delivery of horticultural activities as an intervention strategy in conjunction with positive behavior support (PBS) and positive guidance appears to be promising. The importance of identifying, intervening, resolving, and preventing challenging behavior early in childhood development was noted by the Commission on Mental Health (2003) and Dunlap et al. (2006). By introducing horticulture to younger children, the opportunity for success increases by providing a set of skills that they can use for the rest of their lives. This type of activity provides teachers with the opportunity to model caring, empathy, cooperation, and community oriented behaviors, and for students to observe and imitate those behaviors. The researcher hopes that these activities will be incorporated into the daily classroom routine throughout the year and will encourage cooperation, positive peer interactions, and improved task engagement.

Today, many teachers feel that they are unprepared to manage students with challenging behavior and many of those rely heavily on punitive practices (Pennsylvania Department of Education, 2012). Educators have reported the need for training in order to successfully work with students presenting challenging behavior as one of their highest priorities (Hemmeter, Fox, & Broyles, 2007). How then do teachers, educators, and administrators in a tight economy meet the needs of each and every student while increasing student performance and decreasing administrative costs? Several low-cost, non-invasive approaches show promising results when implemented in a variety of settings, including schools, correctional facilities, and hospitals. The researcher discussed three approaches that, when used in combination, could provide teachers with the tools necessary to increase positive peer interactions and task engagement.

The delivery of horticultural activities as an early intervention strategy in conjunction with positive guidance principles and PBS appeared promising. Horticultural activities, positive guidance, and PBS have demonstrated to be effective with students at risk and students with and without disabilities in a variety of settings (Fox, Dunlap, & Powell, 2002). The importance of identifying, intervening, resolving, and preventing challenging behavior early in childhood development was noted by Dunlap et al. (2006).

Complementary or alternative therapies/activities are other approaches which can be incorporated into the preschool setting as measures to assist in meeting the specific needs of students. These approaches provide all students the opportunity to participate in various activities that could enhance their overall social-emotional well-being and promote academic success. Complementary or alternative therapies, as defined by the National Center for Complementary and Alternative Medicine (n.d.), are a group of therapies that do not fit into what is currently considered conventional medicine or education, and include art, music, dance/movement, and horticultural activities. These therapies have been utilized with populations in healthcare and correctional facilities, as well as educational settings with interesting outcomes. While the research is limited, the studies that have been conducted produced promising results (Pratt, 2007). Alternative or complementary therapies are

often presented in the typical classroom and supported by the classroom teachers and staff (Boso, Emanuele, Minazzi, Abbomonte, & Politi, 2007). Horticultural activities are non-invasive activities that can be presented in a variety of settings and can provide an environment where all individuals can participate, therefore, encouraging positive peer interactions and task engagement (Hewson, 1994; Moore, 1989; Relf, 1992; Sempik et al., 2003). Although the literature uses the term "horticulture therapy", the term "horticultural activities" will be used because the term "therapy" connotes the need for treatment or healing. The term "activities" is a more accurate reflection of the intended strategy to be used in this study. Horticultural activities are activities using anything to do with plants, including soil, seeds, insects, arts and crafts, and garden-friendly creatures. Unlike horticultural therapy, horticultural activities are presented by someone other than a registered horticulture therapist in a non-therapeutic setting. The purpose is to expose, through investigation, observation, and hands-on experiences, individuals to the natural environment in a non-invasive manner. It has been noted by Caitlin (2012) that horticultural activities are multi-sensory, assisting individuals develop communication, social, cognitive, motor, and sensory skills. It appears that horticultural activities offer benefits to participants with or without illnesses, disabilities, or specific needs. Therefore, it may prove to have an overall positive effect on individuals participating in these activities.

Research Questions

1. How does the use of horticultural activities in an inclusive preschool setting influence students' active engagement, passive engagement, and off-task behavior?
2. What are the teachers' perceptions of the use of horticultural activities with preschool students in an inclusive setting?
3. What are the students' perceptions of the horticultural activities in an inclusive setting?

Research Purpose

The overarching goal was to observe how the introduction of horticultural activities into the preschool curriculum utilized as a complement to the positive guidance principles which were already in place, may influence behavior by increasing peer interactions and task engagement among preschool students. Persistent behavior problems that present in early childhood are the best indicators of teenage delinquency, school dropout, and adult incarceration (Dunlap et al., 2006). Thus, implementation of strategies that can effectively reduce or eliminate persistent behavior problems is critically important.

Some of the literature suggests that because horticulture therapy is successful with older children and adults with physical, mental, and emotional disabilities, it could be assumed that it would be successful with young children (Relf, 1992; Adil, 1994; Simson & Straus, 1998). Given the data in support of the effectiveness of horticulture therapy with elementary and secondary children, adjudicated juveniles, and adults, one can hypothesize that horticultural activities are an appropriate preventative strategy for preschool children (Davis, 1998; DeMarco, Relf, & McDaniel, 1999; Finch, 1995; Hewson, 1994; Jiler, 2007; McClellan, 2010; Moore, 1989; Relf, 1992; Waliczek, Bradley, & Zajicek, 2001).

Methodology

The purpose of this study was to examine the possible behavioral influences of horticultural activities on preschool students (aged 3-5). The researcher utilized these activities in an inclusive preschool setting as an

instructional strategy based on the positive guidance and PBS three-tier models. This study used a mixed methods (quantitative and qualitative), multiple baseline design (Creswell & Plano-Clark, 2008) to investigate the influence of horticultural activities on task engagement and peer interactions with two classes of 3-5 years old children in an inclusive preschool setting. It was intended to serve as a pilot for future larger-scale research for young children in general and those at risk for behavioral/emotional disorders in particular. Mixed methods research is a design for collecting and analyzing quantitative and qualitative data in a study in order to understand a research problem (Creswell & Plano-Clark, 2008).

Research Design

The researcher used a mixed methods, multiple baseline design across two classrooms, and triangulation methods to connect the quantitative and qualitative aspects of the data collection in this study. The purpose was to gather different but complementary information to provide the most comprehensive data for analysis to answer the research questions (Creswell & Plano-Clark, 2008). The study was conducted over a 16-week period from December 2011 to March 2012.

The researcher, along with the teachers and students, created "plant time" rules that were reviewed at the beginning of each activity. A tri-fold poster, with the "plant time" rules created by the researcher and the students, was used as the first horticultural activity. These rules were the same as the facility and classroom rules: "Share with your friends", "Listen to the teacher", "Be careful", "Keep your hands and feet to yourself", and "Be kind to everyone" (see Table 1). After the rules were written on the tri-fold poster, each student, teacher, staff, and the researcher wrote their name on the poster. Prior to beginning horticultural activities, the researcher taught what each expectation looked like in a horticultural activity setting, which included a roundtable in the classroom and the raised bed gardens in the playground area. These rules also were reviewed prior to each of the horticultural activities.

Table 1

Classroom Rules Vs. Plant Time Rules

Classroom rules:	Plant time rules:
Share with your friends;	Share the plants things with your friends;
Listen to your teacher;	Listen to Miss T (the researcher);
Be careful;	Work carefully and gently;
Keep your hands and feet to yourself;	Keep your hands and feet to yourself;
Be kind	Be kind to everyone

Preschool Participants

The participants were in one of two preschool classes recommended by the director and chosen in collaboration with the teachers who had previously agreed to participate. Depending upon the day of the week, there were 10-15 students in each class. This number varied because some of the children attend the program on a part-time basis. Both classes had students ranging from 3-5 years old (see Table 2).

Data Collection and Analysis

The researcher included observations and teacher and student satisfaction surveys. Engagement data were collected to provide observational validation to the use of horticultural activities and the resulting changes in behavior should occur as predicted. Qualitative data, based on information gained through inquiry, explore

social or human questions. The researcher details the views of the participants and conducts the study in the natural environment (Creswell & Plano-Clark, 2008). Qualitative data included student journals, field notes, observations, and teacher interviews. Teachers' perceptions of the ease of implementation and social validity were addressed through the interviews and surveys.

Table 2

Demographics of the Students

	Gender	3 years old	3½-4 years old	4½-5 years old
Class 1	Boy	2	4 (3CO)	2 (1CO)
	Girl	1	3	1
Class 2	Boy	1 (CO)	3 (1CO)	2
	Girl	3	2 (1CO)	1 (CO)

Note. CO: Consistently observed.

Observations

Student interaction was observed and recorded by the researcher and a trained observer. There were four students in each class identified by teachers and administration as presenting challenging behavior. The students were consistently observed. In addition, randomly chosen students were observed for two minutes in 15-second intervals prior to and after the activity behaviors being observed for active or passive engagement and off-task behavior.

Definitions

Active engagement included remaining in an activity area, answering questions, reading along with the adult, and making eye contact with the person making the presentation.

Off-task was defined as not participating, not paying attention, or doing something other than the task at hand.

Passive engagement was defined as being in the area where the activity was being presented and not causing any disruption, but not actively participating in the activity.

Task engagement was a twofold concept which included active and passive engagement and off-task behavior.

Three Phases of Data Collection

Data were collected across the three phases of the study. Phase 1 baseline data were collected two times each week for three weeks in Class 1 (six observations) and four weeks in Class 2 (eight observations). During those sessions, the researcher and the observer observed students during the morning meeting, which was the first formal activity of the school day. The percentage of time actively engaged during baseline varied from a low of 10% to 50%.

During phase 2, the intervention phase, data were collected for 10 weeks, two times each week. Observations were conducted immediately prior to (20 observations) and immediately following (20 observations) horticultural activities which were presented by the researcher. Prior to the horticultural activities, the percent of time actively engaged consistently ranged from 10% to 40% with the exception of one lesson presented to both classes at the same time (Groundhog Day). Due to the availability of materials and other school activities, both classes participated in the pre-horticultural activities at the same time, creating a larger

group of students. Typically, active engagement was higher following the horticultural activities, during kid journal writing time. The researcher found that during this time, the students were very much engaged in conversation with each other. They were often heard discussing the activities they had just participated in and helping each other decide what to draw and write about. It was reported by the teachers that this was a phenomenon that had not previously occurred. Another possible reason for the increase in active engagement was that students were working with teachers one-on-one or small group situations, therefore receiving more individualized attention.

Phase 3, maintenance, presented an inconsistent but higher percentage of active engagement than during baseline or during the observations prior to the horticultural activities. The level of active engagement was not maintained at the same level as after the horticultural activities. Data were collected during the morning meeting two times each week (six observations) for three weeks in Class 1 and two weeks in Class 2 (four observations). This decrease may be attributed to the fact that the morning meeting is a whole class activity rather than one-on-one or small group activities.

Data Interpretation

Figure 1 demonstrates an overall increase in active engagement across the three phases of the study. There appears to be a notable increase in active engagement in both classes during the post-horticultural activities section of the intervention phase. Although this increase was not maintained to the same level by session during the maintenance phase, active engagement was more consistent throughout this phase.

Figure 1. Classes 1 and 2 mean percentage of active engagement.

Passive engagement data were collected across the three phases (see Figure 2). Baseline data were collected for three weeks for Class 1 and four weeks for Class 2. Class 1 presented more consistency during the baseline phase than did Class 2. During the intervention phase, passive engagement was very inconsistent. It appears that the percentage of passive engagement was lower during post-horticultural activities, when active engagement was higher. During phase 3, the maintenance phase, passive engagement was lower than during baseline and post-horticultural activities for Class 2; however, it was higher than the post-horticultural activities for Class 1.

Figure 2. Classes 1 and 2 mean percentage of passive engagement.

Off-task behavior data were collected across the three phases of the study (see Figure 3). Phase 1 baseline data were collected for three weeks in Class 1 and four weeks in Class 2. During those sessions, the researcher and the observer observed the students during the morning meeting, which was the first formal activity of the school day. The percentage of time during baseline varied from a low of 15% to 50%.

Figure 3. Classes 1 and 2 mean percentage of time off-task.

During phase 2, the intervention phase, data were collected for 10 weeks. Observations were conducted immediately prior to and immediately following horticultural activities which were presented by the researcher. Prior to the horticultural activities, the percentage of time off-task behavior ranged from 0% to 50% with the exception of one lesson presented to both classes at the same time (Groundhog Day). Due to the availability of materials and other school activities, both classes participated in the pre-horticultural activities at the same time,

creating a larger group of students. Typically, off-task behavior was higher prior to the horticultural activities with Class 1, demonstrating more consistency throughout the three phases. Data were collected during kid journal writing time where the students were very much engaged in conversation, discussing the activities they had just participated in. It appears that the increase in active engagement was influenced by the one-on-one or small group situations that the students were involved with and the more personalized attention presented by the teachers.

Phase 3, maintenance, presented an inconsistent but higher percentage of active engagement than during baseline or the observations prior to the horticultural activities. The level of off-task behavior was maintained at the same level as after the horticultural activities in Class 1; however, Class 2 presented inconsistent results. Data were collected for three weeks in Class 1 and two weeks in Class 2, and were collected during the morning meeting.

According to Figure 3, there was an overall and consistent decrease in off-task behavior beginning during baseline through maintenance for Class 1 and Class 2. This corresponded with an increase in active engagement particularly during the kid journal writing activities following the horticultural activities.

Journal Writing Activity

Kid journal writing, as part of the typical day, changed into a more social, cooperative time. As reported by the teachers and noted in the researcher's field notes, the students as a whole class were involved in more conversations during this period than they had been before. The children often discussed what they were going to draw or write about, and assisted each other with creative spelling or simple shared ideas. As reported by the teachers, even those students who in the past had difficulty remaining at the writing center became more involved. These same students appeared to be more calm and relaxed when asked to draw/write in their kid journal writing time. Some of the students who in the past were less cooperative at the writing table came more willingly and participated without incident. The students began to incorporate more information from the activity and expressed their ideas and opinions more freely. The students were able to better describe what they had done in the activity as well as their personal likes and dislikes. In reviewing field notes and student journals, the following observations of changes in the four students in Class 1 and Class 2 can be thought of as follows: Students who in the past refused to sit at the table and complete the written assignments were now participating in small groups, where they worked together to creatively spelled words, comment on pictures, and discuss the daily activities. There was an increase in positive verbal peer interactions among all of the students in both classes. Of the eight consistently observed students, student 2-2 presented the most notable changes overall. Student 2-2 in particular presented critical changes in behavior and in his writing. He increased the number of words and details that he incorporated into his kid writing and into the illustrations as well as his positive peer interactions.

Conclusion

Students in Class 1 and Class 2 presented an increase in active engagement during the post-horticultural activity observation of the intervention phase. However, the increase was inconsistent and with few exceptions was not maintained throughout the maintenance phase. The levels of active engagement during the maintenance phase, however, were higher than passive engagement or off-task behavior.

The findings in regard to passive engagement for Class 1 and Class 2 were very inconsistent across all

phases. Incidents of passive engagement were lower during periods of higher active engagement.

Off-task behavior was consistently higher than active or passive engagement during the baseline and pre-horticultural activity phases; however, the percentage of time off-task behavior decreased during the post-horticultural activities and maintenance phases. While the incidents were not consistent, the percentage of time off-task remained lower during the maintenance phase than any other time across phases.

The use of plants and plant materials in rehabilitative settings slowly evolved from a less structured set of activities to a more structured form of therapy. Although horticulture therapy has been in existence for centuries and is currently used in hospitals, correctional facilities, youth detention centers, and schools, there has been little research demonstrating the success of such activities in preschool settings.

The researcher sought to determine whether using horticultural activities in an inclusive preschool setting would positively influence student behavior. To do this, the researcher examined the influences of horticultural activities with regard to active and passive engagement, off-task behavior, and positive and negative physical and verbal peer interactions.

Research conducted by Fox and Little (2001) and Benedict, Horner, and Squires (2007) shows that early childhood educators are now presented with students who demonstrate challenging behavior and are at risk for severe behavior and emotional issues. These behaviors and issues not only affect the students' long-term academic outcomes and emotional well-being, but they can affect the immediate and long-range classroom and school environments. Positive guidance and PBS are current proactive approaches to working with students, faculty, staff, and parents to create and maintain positive environments across settings and to encourage positive and productive students (Fox & Hemmeter, 2009). The presentation of horticultural activities was used to determine what influences they might have on active engagement, passive engagement, and off-task behavior.

Baseline

The primary finding during the baseline phase was that there was a lot of inconsistency in student behavior regarding active and passive engagement, off-task behavior, and positive and negative physical and verbal interactions across classrooms. Baseline data were collected two times each week for three weeks in Class 1 and four weeks in Class 2. The baseline data demonstrated that there were inconsistencies in task engagement and peer interactions across classrooms. Some of this inconsistency might be attributed to the fact that baseline data were collected prior to the winter holiday break and there were atypical activities occurring throughout the school day.

Intervention

The intervention phase of the study began with the implementation of horticultural activities in each of the classrooms. The three parts to the twice-weekly horticultural activities sessions included pre-horticultural activity observation, the actual horticulture activity, and the post-horticultural observation.

During the pre-horticultural activity observation, the percentage of time off-task was high; however, active and passive engagement increased in both Class 1 and Class 2 throughout this phase. There was a substitute teacher present during several sessions during this phase, and it appears that during those sessions, there was inconsistency in behavior. This was a variable that was unanticipated by the researcher.

The positive and negative physical interactions were relatively consistent in both classes, however, by the end of the intervention phase, there were fewer negative physical or verbal interactions observed. The increase

in positive physical and verbal interaction and decrease of negative physical and verbal interaction appear to relate to an increase in active and passive engagement.

During the post-horticulture data collection, the percentage of time off-task was greatly reduced while active and passive engagement increased in both Class 1 and Class 2.

By the end of the intervention phase, there were very few incidences of negative physical or verbal interactions. This may be attributed to the high percentage of passive and active engagement. It appears that when there was a higher percentage of engagement, there was an increase of positive physical and verbal interactions.

Maintenance

During the maintenance phase, data collected during the morning meeting showed off-task behavior was almost totally extinguished. Active engagement increased while passive engagement remained relatively consistent. There appeared to be a spike in verbal interaction during the maintenance phase. It could be suggested that the spike in positive verbal interactions during the last part of the intervention phase was due to common interest in the shared activity. For Class 2, positive physical interaction was inconsistent, with higher numbers of incidents at the beginning and ending of the sessions.

There was a great decrease in the incidents of negative physical or verbal interactions among the students.

During this phase, the teachers were very involved in continuing the study of horticulture. Literature materials were provided by the researcher. These materials provided the teachers with the information necessary to continue and maintain the classroom projects.

It appears that there was a relationship in Class 1 and Class 2 between active and passive engagement and positive physical and verbal peer interactions. This is evidenced through the data collected during the maintenance phase of the study.

Overall, the implementation of horticultural activities in the inclusive preschool setting appeared to positively influence task engagement and peer interactions. This subject requires further study over a longer period of time for a clearer understanding of the influence horticultural activities have on young children.

Implications for Future Research and Practice

This dissertation supports the need for further research in the area of complementary therapies, specifically horticultural activities as a strategy to encourage positive peer interactions and increase task engagement. These activities used in conjunction with positive guidance and PBS principles have the potential to yield extraordinary results.

The first area for future researchers to critically examine is the use of horticultural activities throughout the school year as part of the classroom routine in the preschool setting, and how these activities influence student behavior, specifically regarding peer interactions. Teachers and/or administrators would monitor behaviors, particularly for those students who have a specific special education or medical diagnosis or present consistent challenging behavior as defined by the facility in their code of conduct. Data could be collected using a tool provided by the researcher and specifically designed to address the behavioral interests and needs of the educators and families. For the purposes of this dissertation, the researcher, who has a specific interest in horticultural activities and therapies, presented the activities to the students and teachers; however, future activities could be presented by the classroom teachers at the facility. While these are not critical research

questions, they need to be thoroughly discussed with the researcher and the upper and middle management as well as the teachers at the childcare facility. Librarians, teachers, parents, and community members could all make contributions to the success of a horticultural program in the inclusive preschool setting. Librarians could provide the children's literature to parents and teachers to introduce and follow-up these activities. Art and music teachers could support these activities through their own lessons and activities. Perhaps Master Gardeners could participate in activities at the preschool facilities in support of the teachers. Questions that should be considered for future activities would be: Who would be the individual presenting the activities? Would this individual need to be an employee of the childcare facility? Would or could the teachers be willing to consistently present the horticultural activities? More importantly, would they be willing to participate in the necessary training? One possible solution to this question would be to join forces with a college or university's extension program and work with their Master Gardening candidates and certificate holders. This could turn into a symbiotic relationship as Master Gardeners are required to participate in community service hours annually to maintain the Master Gardener status. By working with children in schools in community gardens, they could fulfill their required community service hours. Additionally, the Master Gardeners could train preschool staff in basic horticultural activities, and the staff could replicate those horticultural activities in future classes.

Additional research is needed to investigate the actual effectiveness of using horticultural activities and positive guidance principles as a strategy to influence positive peer interactions and task engagement and to develop effective models that can be implemented by teachers and classroom staff in the inclusive classroom setting. Prior knowledge and experiences will dictate how, when, and to whom these activities are presented and possibly who presents the activity. It would be important to study facilities that currently employ the positive guidance/PBS as well as those that do not have these frameworks in place. There could be significant differences in site that do not have the positive guidance/PBS training.

As a final reflection, it is interesting to note that most of the studies previously conducted in the area of horticulture therapy have been of a more qualitative nature. This might be explained by the incredible "human/emotional" element that is difficult to measure empirically. These types of activities provide individuals with a "feel good" opportunity that cannot be measured on a scale; however, the researcher believes that working in conjunction with horticulture therapists, researchers can develop a more effective data collection tool. Future researchers will be able to more accurately evaluate the benefits and influences of horticulture for all individuals.

References

- Ackley, D., & Cole, L. (1987). The effects of a horticulture therapy program on children with cerebral palsy. *Journal of Rehabilitation*, 53(4), 70-73.
- Adil, J. R. (1994). *Accessible gardening for people with physical disabilities*. Bethesda, M.D.: Woodbine House.
- American Horticultural Therapy Association (AHTA). (1999). *Definitions and positions*. Retrieved from <http://www.ahta.org>
- Benedict, E. A., Horner, R. H., & Squires, J. K. (2007). Assessment and implementation of positive behavior supports in preschools. *Topics in Early Childhood Special Education*, 27(3), 174-192.
- Boso, M., Emanuele, E., Minazzi, V., Abbomonte, M., & Politi, P. (2007). Effect of long-term interactive music therapy on behavior profile and music skills in young adults with severe autism. *Journal of Alternative and Complementary Medicine*, 13, 709-712.
- Caitlin, P. (2012). *The growing difference: Natural success through horticulture-based programming*. Self published.
- Commission on Mental Health. (2003). *Newsletter*. Retrieved from <http://www.nami.org>

- Creswell, J. W., & Plano-Clark, V. L. (2008). *Designing and conducting mixed methods research*. Thousand Oaks, C.A.: Sage Publishing.
- Davis, S. (1998). Development of the profession of horticulture therapy. In S. P. Simson, & M. C. Straus (Eds.), *Horticulture as therapy: Principles and practice* (pp. 3-20). New York, N.Y.: Hawthorne Press.
- DeMarco, L., Relf, D., & McDaniel, A. (1999). Integrating gardening into the elementary school curriculum. *HortTechnology*, 9(2), 276-281.
- Dunlap, G., Strain, P. S., Fox, L., Carta, J. J., Convooy, C., Smith, B. J., & Kern, L. (2006). Prevention and intervention with young children's challenging behavior: Perspectives regarding current knowledge. *Behavioral Disorders*, 32(1), 29-45.
- Fabor-Taylor, A., Wiley, A., Kuo, F., & Sullivan, W. C. (2001). Coping with ADD: The surprising connection to green play settings. *Environment and Behavior*, 30(1), 54-77.
- Finch, C. R. (1995). Green brigade: Horticulture learn and earn program for juvenile offenders. *HortTechnology*, 5(2), 118-120.
- Flagler, J. (1993). *Rutgers cooperative research and extension fact sheet horticulture therapy*. Rutgers' Cook College: Rutgers-Cook College Resource Center.
- Fox, L., & Hemmeter, M. L. (2009). A program-wide model for supporting emotional development and addressing challenging behavior in early childhood settings. In W. Sailor, G. Dunlap, G. Sugai, & R. Horner (Eds.), *Handbook for positive behavior support* (pp. 177-202). New York, N.Y.: Springer.
- Fox, L., & Little, N. (2001). Starting early: Developing school-wide behavior support in a community preschool. *Journal of Positive Behavior Interventions*, 3, 251-254.
- Fox, L., Dunlap, G., & Powell, D. (2002). Young children with challenging behavior: Issues and considerations for behavior support. *Journal of Positive Behavior Interventions*, 4(4), 208-217.
- Hemmeter, M. L., Fox, L., & Broyles, L. (2007). A program-wide model of positive behavior support in early childhood settings. *Journal of Early Intervention*, 29(4), 337-355.
- Hewson, M. L. (1994). *Horticulture as therapy: A practical guide to using horticulture as a therapeutic tool*. Ontario, C.N.: Mediaworks Design and Communications.
- Jiler, J. (2007). *Doing time in the garden: Life lessons through prison horticulture*. Oakland, C.A.: New Village Press.
- Kuo, F. E., & Sullivan, W. C. (2001). Aggression and violence in the inner city: Effects of environment via mental fatigue. *Environment and Behavior*, 33(4), 5.
- McClellan, S. (2010). Snow or shine, the forest in the classroom: A new kindergarten aims to counter nature deficit disorder. *Hill Country Observer*, 3, 26.
- Moore, B. (1989). *Growing with gardening: A twelve-month guide for therapy, recreation, and education*. Chapel Hill: University of North Carolina Press.
- Morgan, B. (1989). *Growing together: Activities to use in you horticulture and horticulture therapy programs for children*. Pittsburgh, P.A.: Pittsburgh Child Guidance Foundation.
- National Center for Complementary and Alternative Medicine. (n.d.). *What is CAM?* Retrieved from http://nccam.nih.gov/health/what_is_cam/D347.pdf
- Pennsylvania Department of Education. (2012). *Pennsylvania training and technical assistance network*. Retrieved from <http://www.pattan.net/>
- Pratt, R. R. (2007). Art, dance and music therapy. *Physical Medicine and Rehabilitation Clinics of North America*, 15, 827-841.
- Relf, D. (1992). Human issues in horticulture. *HortTechnology*, 5(2), 9-171.
- Relf, D., & Dorn, S. (1995). Horticulture: Meeting the needs of special populations. *HortTechnology*, 5(2), 94-103.
- Sempik, J., Aldridge, J., & Beckers, S. (2003). *Horticulture as therapy: From Benjamin Rush to the present day*. Leicestershire, U.K.: Centre for Child and Family Research, Department of Social Science, Loughborough University.
- Simson, S., & Straus, M. C. (Eds.). (1998). *Horticulture as therapy: Principles and practice*. New York, N.Y.: Hawthorne Press.
- Smith, L. L., & Motsenbocker, C. E. (2005). Impact of hands-on science through school gardening in Louisiana public elementary schools. *HortTechnology*, 15(3), 439-443.
- Waliczek, T. M., Bradley, J. C., & Zajicek, J. M. (2001). The effects of school gardens on children's interpersonal relationships and attitudes toward school. *HortTechnology*, 11(3), 466-468.