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*Original Paper*

# Assessing Potential Change in Louisiana Juvenile Detainee's Knowledge and Attitude during Garden Programming

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***Abstract***

*University-based horticulture departments have explored the relationship between garden programs and increased horticulture knowledge among primary and secondary students. Studies have established positive correlations between youth garden programs and increased garden knowledge. The objective of this research was to determine if participation in a garden workshop series had positive effects on youth detained in juvenile detention centers garden-based knowledge and immediate mood. Participation led to a 17% increase in garden-based knowledge ($P \leq 0.05$) and a positive shift in mood ($P \leq 0.05$) on two of the three days of the workshop series. Based on this experience, we highly recommend juvenile detention centers incorporate garden programming as additional educational opportunities for detained youth.*

***Keywords***

*Incarcerated, youth, jail, environmental education, mood*

## 1. Introduction

United States youth are educated in many settings. Parochial and private schools, charter, Montessori and home schools are several examples. Unfortunately not all youth remain in traditional school settings, especially if they become in trouble with the law. When this occurs, youth are placed in juvenile detention centers to await trial dates, judgments or serve a sentence. Not all, but some Louisiana juvenile detention facilities are mandated to educate enrolled youth at the same standards as traditional schools. This specific study was conducted at the East Baton Rouge Juvenile Detention Center (EBRJDC) in 2018. East Baton Rouge Parish is located in the southern portion of the state and encompasses the capitol of Louisiana, Baton Rouge. In 2018, the EBRJDC admitted 646 youth, of which, 17.03% were female and 82.97% male. Racial statistics in 2018 for the 646 youth were

categorized as 93.03% black, 6.19% white, and 0.77% other (City of Baton Rouge Juvenile Detention Center, 2018). The EBRJDC provides school programming and even special education to enrolled youth. However, a combination of alternative and traditional teaching methods are needed to educate detained students so they do not return to the juvenile detention system. According to the Louisiana Office of Juvenile Justice, 47.5% of youth released from Louisiana's juvenile justice system will return to custody within 3 years (Louisiana Center for Children's Rights, 2018). Davis et al. (2014) found adult inmates who participated in prison education programs are 43% less likely to return to prison once released. Additional educational programs for youth detained in juvenile detention centers is needed because youth lack dedicated time spent outdoors when held in juvenile detention facilities. Garden programs are a potentially positive method to employ educational programming in the outdoors.

School gardens were first recorded in the United States in 1891 (Subramaniam, 2002). The benefits of school gardens are numerous. Gardens provide school communities with fresh produce, hands on learning experiences for younger children, and work force preparation for older students. Gardens create wildlife habitats, are environmentally friendly and beautify urban and rural settings (USDA-People's Garden-Impact, 2018). In the case of juvenile detention garden programs, Sandel (2004) found that hands-on garden studies with detained youth led to an increased knowledge in specific subjects, aided in emotional well-being and improved participants demeanor. Other studies indicate that students from disadvantaged or poverty stricken situations without prior garden experience were receptive to alternative educational garden activities (Sandel, 2004; Olszowy, 1978). The objective of this research was to determine if participation in a garden workshop series had positive effects on garden-based knowledge and immediate mood of detained youth.

## 2. Method

### *2.1 Site Description*

Approval was granted from the Institutional Research Board at Louisiana State University (IRB approval number 3539) to conduct garden activities and evaluations with detained youth at the East Baton Rouge Juvenile Detention facility. Three raised garden beds were constructed and placed in an outdoor recreational area. The outdoor recreation area at the juvenile detention center consisted of multiple basketball courts and a simple turf lawn. The addition of the gardens provided the sole natural components to the recreational area. The three beds were 1.2 meters wide, 2.4 meters long, and were 30.48 cm tall. The beds were spaced 1.5 meters apart. Soaker hoses were installed to provide water as needed in the garden beds. Before garden activities were presented, detained participants helped construct beds, load and amend soil following instruction from the lead LSU Ag Center graduate student, and plant vegetable and herb crops. Other than the use of ant control insecticides, no other insecticides or fungicides were applied through the duration of the project. All lessons were conducted near or in the garden space on days when weather permitted. If the lesson was conducted on a day

when the weather was poor, soil, vegetable or herb crops were gathered from the garden site as well as other sites so the lesson could be conducted indoors.

*2.2 Participants*

One hundred and two juvenile detained participants completed the entire garden program. Additional youth participated, but because of limited sentences, lawyer meetings, court dates and other interruptions, the limited data collected on these participants was not included in the reported numbers. The one hundred and two detained participants were divided into smaller groups ranging from eight to 20 participants per replication, totaling 102 students participating over a 7 month period. The program was replicated seven times, for a period of 3 days per month for 7 total months. The garden programming spanned over three days each replication (month) as the lead graduate student was only allocated 2 hours per day for 3 days in each month to conduct garden programs. In between monthly garden activities, juvenile detained participants were allowed, during recreational time, to monitor irrigation needs of the garden, pull weeds and evaluate vegetable crop growth. Ages of detained participants ranged from 12 to 20 years of age. The majority of garden participants were male and of minority heritage. Participants were provided a garden workbook and all supplies needed to conduct each hands-on activity.

*2.3 Lesson Development*

A garden workbook was created for detained participants to use during the program. Full workbook and all lessons are available on Louisiana State University's electronic thesis and dissertation web page at this link (https://digitalcommons.lsu.edu/gradschool_theses/4684/). The workbook included a detained participants assent form, explaining the program was completely optional, information was recorded anonymously, participation was not forced. Detained participants could leave the garden program and return to their normal activities inside the detention center without penalty. The next section in the workbook was a personal attitude/mood selection chart called Pick-A-Mood. The Pick-A-Mood chart was created by authors from Delft University of Technology and Eindhoven University of Technology (Desmet P. M. A. et al., 2012) and aided in gaging the mood of detained participants before and after each day's garden activities. The Pick-A-Mood chart uses nine emotional states of being "moods" that detained participants could select from to best describe how they felt at that very moment. A descriptive word such as "calm" was coupled with a picture of a face expressing that particular mood. Detained participants circled the face that best matched their current mood. Each garden activity was accompanied by a pre-lesson question, lesson objectives, materials needed for the lesson, instructions detailing how to complete the hands-on activity, and a post lesson question. Each workbook contained three days' lessons (two lessons per day). The program was conducted once a month on three consecutive days for seven months. Daily activities occurred over a 2 hour period. Because juvenile detention participants were required to complete their normally scheduled class assignments, the garden lessons did not begin until 3pm with a strict 5pm completion deadline. The garden program was popular among detained participants as normally allotted recreational time

included simply being outside or playing basketball. Allotted recreational time was limited and heavily dependent on availability of staff to supervise, weather, and behavior of juvenile detainees.

*2.4 Workbook Lessons*

For this juvenile detention garden series, there were a total of six lessons, two given per day for three consecutive days each month that detained participants were encouraged to attend. Individual garden lessons are described in the following paragraphs.

2.4.1 Day 1: Plant Parts You Eat

The objective of the lesson was to learn the different parts of a plant and to identify which parts are consumed when eating various fruit and vegetables. Six basic parts of a plant were discussed: roots, stem, foliage, flowers, fruit, and seed. Detained participants were asked to identify the edible portion of vegetables with the correct plant part. After correct identification of plant parts, detained participants were allowed to taste the demonstration fruit and vegetable crops. When possible, demonstration vegetables were harvested from the garden grown onsite.

2.4.2 Day 1: Garden Recycling

The objective of the lesson was to expose participants to creative ways to repurpose paper products into usable horticulture materials. Grow cards were created by participants from recycled paper and seeds. Grow cards were made from newspaper blended with water. The mixture is blended until the consistency of thick oatmeal and poured into a mold. Seeds are pressed into the top layer of the mold and excess water is squeezed. Once dried, cards can be given to other gardeners or planted directly into the garden. The paper that would normally have been thrown into a landfill would decompose in the soil and the seeds would germinate. Detained participants were allowed to keep the grow cards with their personal items until they left the facility. Although not quantified, all participants expressed gratitude to keep the small token from the garden program.

2.4.3 Day 2: Worm Composting

The objective of this lesson was to introduce the students to vermiculture. Beneficial attributes of worms were discussed. A bin was constructed using two plastic storage containers. Students added numerous strips of newspaper topped off with potting soil. Using the vegetable and fruit scraps from the previous day's lesson and a cup of water, the bin was ready for worms. Detained participants were encouraged to add the live worms to the completed bin. Instructions on how to care for the worms and how to extract compost from the bins without disturbing the worms were provided.

2.4.4 Day 2: Soil: What Is It Made of?

The objective of this lesson was to give detained participants a general idea of what constitutes soil and how it is formed. A discussion was led of the varying components that make up soil along with visual comparisons to understand particle sizes. For example a pea represented clay, a ping pong ball represented silt, and a basketball represented sand. Soil samples from several Louisiana locations were placed into glass jars, filled with water, and mixed to reveal the percentage of components in each

sample once settled. Detained participants examined differences from their garden's soil compared to soils collected throughout Louisiana.

#### 2.4.5 Day 3: It's an Herb, Herb!

The objective of this lesson was to expose detained participants to herbs used in recipes. Multiple herbs were purchased or pulled from the juvenile detention garden and other LSU Ag Center led gardens for the participants to touch, taste, and smell. Each herb was identified and its uses discussed, as well as when and how to plant that particular herb. Detained participants used bread to taste dry herb mixtures blended with olive oil.

#### 2.4.6 Day 3: Taste Testing

The objective of this lesson was to highlight the senses used to taste and select food including sight, smell, taste and feel. Many varieties of apples were purchased and prepared (cut into bite sized pieces) for a taste test evaluation. A discussion was led about the five senses used to taste and select food. Each detained participant was asked to first rate the apples based solely on their appearance, then to rate the apples again after tasting. Apples were rated on appearance, taste, texture, and sound (crunch).

### *2.5 Pre and Post Test Questions*

A pre-test and post-test question accompanied each lesson (Table 1). Each question was multiple-choice and was worth 16 points for a total of 96 possible points. Partial credit was given if a particular question had more than one correct answer. The test questions were given before any hands-on activities began for the day and asked again once all daily activities were completed. Because detained participants were randomly pulled for various tasks such as lawyer meetings etc., test questions had to be asked daily to maximize data collected.

**Table 1. Test Questions Associated with Garden Lessons Given at a Juvenile Detention Facility in Louisiana**

| Day and Question Number | Objective | Related Question and Potential Answer Choices |
|---|---|---|
| **Day 1 Question 1** | Participants should be able to identify 6 different plant parts and match them with commonly consumed portions of vegetables. | What part of the plant do we eat when we eat a carrot?<br>A. Stem<br>B. Root<br>C. Flower<br>D. Leaf |
| **Day 1 Question 2** | Participants should be able to properly plant vegetable and herb seeds. Participants should relate seed size to proper planting | How deep do you plant a seed?<br>A. 1 foot deep<br>B. 5 times as deep as the seed is wide<br>C. 2-3 times as deep as the seed is wide |

| | | |
|---|---|---|
| | depth. | D. Always as deep as your thumb |
| **Day 2 Question 1** | To see if they could pick some of the features of a worm and to get them thinking about worms in a positive light for the benefit | What positive effect(s) do worms have on plants?<br>A. Fertilize the soil<br>B. Make the soil loose so roots can grow<br>C. Worms eat the roots<br>D. Worms help prevent plant disease |
| **Day 2 Question 2** | To see if they could pick the three things that make up soil and to alert them that there are only three things that create soil. | What are the three main components of soil?<br>A. Sand, rocks, leaves<br>B. Moss, clay, sticks<br>C. Sand, clay, peat<br>D. Sand, silt, clay |
| **Day 3 Question 1** | To see if they knew any uses and to get them thinking about what herbs are and how could they be used. | How are herbs used?<br>A. Seasoning food<br>B. Medicine<br>C. Natural pesticides<br>D. Soaps, perfumes, and oils |
| **Day 3 Question 2** | | You have five senses, sight, hearing, touch, taste, and smell. Which three senses do you use to taste food?<br>A. Sight<br>B. Smell<br>C. Taste<br>D. Touch<br>E. Hearing |

*2.6 Pre- and Post-Attitude Evaluation*

A collaborative effort between Delft University of Technology and Eindhoven University of Technology led to the development of the Pick-A-Mood chart. This chart was used to determine detained participants mood prior to and after participation in each days garden activities (Desmet et al., 2012). The 9 moods detained participants could choose from included: Neutral, Relaxed, Cheerful, Excited, Calm, Bored, Sad, Tense, and Irritated (Figure 1).

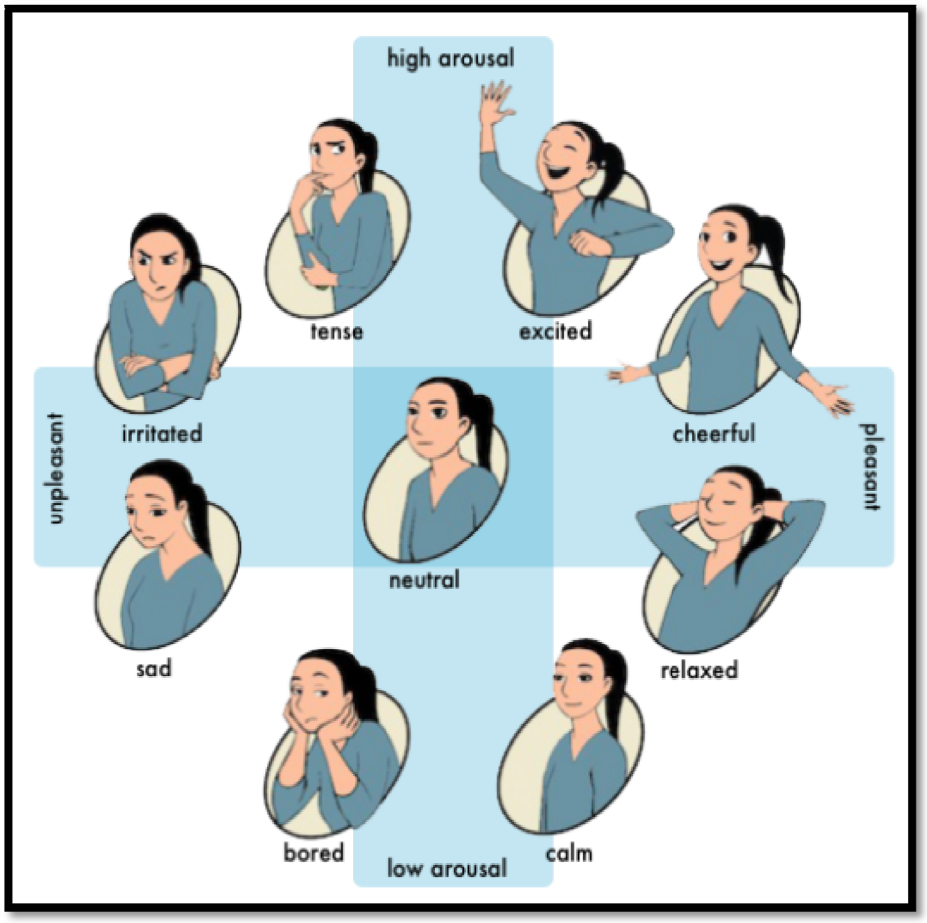


**Figure 1. Pick a Mood Chart Developed by Delft University of Technology and Eindhoven University of Technology**

The detained participants were asked to circle one of the mood choices before the daily garden activities began and at the completion of the daily garden activities. The selection fell before and after they were asked to answer their pre and post test questions. The objective of understanding the detained participant's current moodwas to gauge if the garden workshop series affected participants mood. Education can be achieved in a juvenile detention facility but the facility itself does not harness the same "mood" as a traditional school setting. While our participants were detained, it is still important to understand they are juveniles and rehabilitation or enabling them to feel like a student not an offender is important. In order to measure change in mood we assigned each of the nine "labeled moods" a numerical value. Tense = 1; Irritated = 2; Sad = 3; Bored = 4; Neutral = 5; Calm = 6; Relaxed = 7; Cheerful = 8; and Excited = 9. SAS Statistical Analysis Proc GLM with Duncan was used to determine potential changes in mood and knowledge.

## 3. Result

### *3.1 General Horticulture Knowledge*

Detained participants answered pre and post test questions to identify their garden knowledge level before and after each day of the workshop. Each question was multiple-choice with a value of 16 points totaling 96 possible points. A gain in knowledge was measured for each of the hands-on activities except one lesson (Table 2). The lesson where detained participants did not gain any measureable knowledge was Day 3, lesson 2. In this lesson, detained participants tasted apples and discussed using their senses to taste food. Overall test scores increased by 17% ($P \leq 0.05$), indicating that hands-on garden curriculum helps detained students engage at a deeper level in basic garden knowledge. Day 3, question 2 "You have five senses, sight, hearing, touch, taste, and smell. Which three senses do you use to taste food?" was the only question where there was no statistical increase in knowledge from pre to post test. Inadvertently, the lead graduate student teaching these lessons, focused on the crunching sound made when chewing specific apples used in this lesson. The three correct choices included: sight, taste, and smell. Many students included sound as an answer. This was also a logical choice; therefore, we feel a statistical knowledge increase may have occurred if we had not confused detained participants by focusing so much on sound during the lesson.

The benefits of the garden workshop series were not only felt by the participants, but by all who were involved, including LSU personnel and the East Baton Rouge Detention Center staff. The sense of "feeling good" from this garden workshop is a commonly reported benefit of other extracurricular activities in solemn settings. A study conducted in a hospital setting in New York with nursing students and psychiatric patients, reported viewing the patients as not just a person with a mental illness, but as a person with a disease (Smith, 1998). The students were able to view patients first as people, then second as patients. This garden series project created a feeling that the detained participants were first and foremost, children, not simply juvenile delinquents. This feeling was not only vocalized by the chief graduate student working on this project but also through the on-staff counselor working on a daily basis with these detained youth. This "feel-good" portion of the study is why we chose to capture potential mood change in participants.

**Table 2. Participant Pre- and Post-Test Question Analysis**

| | Day 1 Question 1 | Day 1 Question 2 | Day 2 Question 1 | Day 2 Question 2 | Day 3 Question 1 | Day 3 Question 2 | Total Score |
|---|---|---|---|---|---|---|---|
| | Each Question is Worth 16 points | | | | | | Out of 96% |
| **Pre-Test Points** | 9.4B | 6.4B | 4.1B | 6.6B | 5.9B | 9.2A | 43%B |
| **Post-Test Points** | 12.7A | 11.5A | 6.0A | 10.7A | 7.1A | 9.7A | 60%A |

Numbers in columns with different letters are significant at $P \leq 0.05$ using SAS Proc GLM with Duncan.

*3.2 Immediate Mood Changes*

Detained participants in this study were serving a sentence or waiting for a judges' decision on the repercussions of their alleged crime. Living in a juvenile detention center is not much different from living in an adult jail facility. Therefore, monitoring mood was a portion of this study. Mood was elevated from before to after garden lessons on days one and three of the garden series but not on day two (Table 3). The first and third day's garden lessons included taste testing fruits and vegetables which may explain the increase in mood, whereas the second day was dedicated to soil and worms and mood was not elevated. Snacks are not often provided and sweet desserts or sweet items are limited on the allowed menu. This garden curriculum provided students with a chance at tasting various locally grown items and maybe having an extra snack explains the participant's elevated mood. Even though the second day's mood results were not significant, the score did not decrease.

Our results confirm hands-on garden activities decreased tension and provided participants with pleasant and meaningful activities in a rather mundane and dull environment. Our findings are concurrent with other case studies. Sandel (2004) found in varying therapeutic garden settings, the simple act of gardening elevated participants' moods.

**Table 3. Students Self-Identified State of Mood Before and After Garden Activities Using the Pick-a-Mood Chart Developed by Delft University of Technology and Eindhoven University of Technology**

| Test Time | Day 1 | Day 2 | Day 3 |
|---|---|---|---|
| **Pre Score** | 6.23B | 6.39A | 6.46B |
| **Post Score** | 6.78A | 6.69A | 7.24A |

Columns with different letters are significant at $P \leq 0.05$ using SAS Procedure GLM with Duncan.

The Pick a Mood facial expression chart included 9 states of mood. Each state is ranked from 1 to 9 with 9 being the most happy or joyful.

## 4. Discussion

The goal for creating the garden workshop series at the juvenile detention center was to determine if hands-on garden lessons would academically and emotionally benefit detained participants. A 17% gain in horticulture knowledge and a positive mood change on two of the three days in the series points towards this and similar programs as worthwhile undertakings. Based on our success, we would recommend juvenile detention facilities engage in garden programming. Additionally, this garden workshop series could be adapted by multiple groups such as after care school settings, boys and girls clubs and summer camps.

## References

*City of Baton Rouge, Juvenile Detention Center*. (2018). Department of Juvenile Detention Services Detention Statistics. Retrieved June, 2020, from https://www.brla.gov/DocumentCenter/View/6461/2018-Detention-Statistics

Davis, L. M., Steele, J. L., Bozick, R., Williams, M. V., S. Turner, J. N. V., Miles, J. S., & Steinberg P. S. (2014). *How Effective Is Correctional Education, and Where Do We Go from Here? The Results of a Comprehensive Evaluation*. Santa Monica, CA: RAND Corporation. https://doi.org/10.7249/RR564

Desmet, P. M. A., Vastenburg, M. H., Van Bel, D., & Romero, N. (2012). *Central St. Martin's College of Art and Design. Out of Control* (pp. 11-14). 8th Inter. Design and Emotion Conf.

Louisiana Center for Children's Rights. (2 December 2018). *LOUISIANA'S CHILDREN Juvenile Justice System*. Retrieved from

http://www.laccr.org/wp-content/uploads/2015/09/Juvenile-Justice-Chapter-from-Platform-for-Children.pdf

Olszowy, D. R. (1978). *Horticulture for the disabled and disadvantaged*. Charles C. Thomas., Springfield, MO.

Sandel, M. H. (2004). Therapeutic gardening in a long-term detention setting. *Journal for Juvenile Justice Services*, *19*(1&2), 123-131.

Smith, D. (1998). Horticulture therapy: The garden benefits everyone. *Journal of Psychosocial Nurs. & Ment. Health Serv.*, *36*(10), 14-21. https://doi.org/10.3928/0279-3695-19981001-12

Subramaniam, A. M. A. (2002). *Garden-based learning in basic education: A historical review*. U.C. Davis.

*U.S. Department of Agriculture—People's Garden*. (26 February 2018). Our Impact. Retrieved from https://peoplesgarden.usda.gov/our-impact