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Attitudes and Perceptions of Texas A&M University -Commerce Students Toward Vegetable Gardening

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An Honors Thesis

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ATTITUDES AND PERCEPTIONS OF TEXAS A&M UNIVERSITY – COMMERCE STUDENTS TOWARD VEGETABLE GARDENING

Thesis

by

EMILY K. LAWRENCE

Abstract

This paper investigates the relationship between vegetable gardening and college students, specifically, the attitudes and perceptions college students have towards vegetable gardening and the effect of vegetable gardening on students. Vegetable gardening has indicated many physical and mental benefits, including exercise and reduced stress. There are many studies on this subject involving children and the elderly, but few were found that involved college students. The study performed by researchers involved a pretest, treatment, and posttest. Participants answered a survey on the attitudes and perceptions thy held towards vegetable gardening. After this, the participants gardened and took the same survey again. This allowed the researchers to note the changes in responses before and after the treatment.

Introduction

While humans have gardened for thousands of years, it has recently become more than necessity or ornament. The article "Get a good grip while toiling in the soil" (2006) states that some surveys name gardening as the United States' top outdoor activity. Today, people choose to garden for a variety of reasons, including relaxation and physical exercise (Swank, 2005). There is little research on the effects of gardening relating to young adults. The purpose of this study is to provide more information on the attitudes and perceptions young adults have regarding vegetable gardening, specifically, the effects of vegetable gardening on students and whether participants' attitudes and perceptions changed after the treatment.

The following hypothesis was formed to be tested *a priori* at the .05 level.

Null Hypothesis:

Ho_1: No difference exists in attitudes and perceptions towards vegetable gardening in college students at Texas A&M University – Commerce regarding a hands-on gardening experience.

Literature Review

Humans have used forms of gardening since our creation. In the Bible, Genesis chapter 2, verse 15, states that God put man into the Garden of Eden to care for it (2008). Hunting and gathering from the wild were the primary methods of obtaining sustenance for a long period of time. The change from hunting and gathering to production of crops has garnered the title "Neolithic Revolution." Weisdorf (2005) indicates that this revolution began between 5,000 and 10,000 years ago. The cause of this change is debated. One theory explained by Weisdorf suggests that the act of maintaining and producing food came about after some of the first settlements were created.

During the Neolithic Revolution, gardening was a requirement. It was necessary for the survival of the human population. While gardening is now widely considered to be a hobby and a form of relaxation, there are those who maintain crop-producing gardens as a means of income. According to the 2012 Census of Agriculture, there are as many as 2.1 million farms in the United States, where a farm is classified as an area from which $1,000 worth of agricultural goods are produced and sold or would normally be sold during a Census year (USDA, 2012).

Today, gardens are used for more than simple necessity. While vegetable, fruit, and/or grain production are still a source of livelihood for some, gardening in and of itself has evolved into far more. Rice and Rice (1993) indicated that a property's curb appeal, and thus its overall value, can be increased with just the addition of a well-designed landscape. Lessening expenses by providing produce, creating an outlet for physical exercise, and providing an escape from the strain of everyday life are other positive impacts of such an activity.

Wang and Glicksman (2013) stated that a key reason older adults take part in gardening programs was the eventual outcome of fruits and vegetables. The participants in the study, whose ages averaged at 72 years, gave positive reports on the matter of having fresh, high quality produce available to them at any point. Another benefit of the gardening program was reduced expenses for the members, as they had produce on hand that required no monetary cost. Gardening also provided the senior citizens with an activity they felt responsible to accomplish, and a way to form social connections with others.

Numerous studies have shown that gardening is an activity that provides relief from anxiety. Van den Berg and Custers (2011) found that after being exposed to a stressor, adults recovered from stress more effectively through gardening than other tasks, such as reading. Verra, Angst, Beck, Lehmann, Brioschi, Schneiter, and Aeschlimann (2012) administered a study making use of horticultural therapy. The result of the treatment showed a reduction in anxiety levels and enriched psychosocial health in participants with musculoskeletal pain disorders. Other results indicated increases in various other aspects of physical health.

Lombard, Beresford, Ornelas, Topaha, Becenti, Thomas, and Vela (2014) conducted a study regarding the attitudes held by members of Navajo communities towards gardening activities. Participants saw gardening as a way to reduce diabetes, a highly prevalent disease within many Native American tribes. Park, Shoemaker, and Haub (2008) indicated that gardening is considered to be a physical activity of moderate intensity which offers numerous physical health benefits. An increase in physical activity explains some of the popularity gardening has achieved in recent years (Swank, 2005).

Another reason gardening has become more popular is the increased interest in organic produce. By growing and harvesting produce themselves, people who are health conscious can

know precisely what was involved in the production of their produce. A study of the relationship between health consciousness and organic food consumption among college students found that there was a statistically significant correlation between the two variables. The more health conscious students were, the more organic produce they consumed (Akhondan, Johnson-Carroll, & Rabolt, 2015).

The vast majority of studies reviewed regarding the effects of gardening focus on youth in afterschool programs and older adults in community gardening situations. The results of studies reveal numerous and varied physical, mental, and emotional benefits. Though there are few studies on the subject regarding college students, Mecham and Joiner (2012), through a qualitative experiment performed at a university, indicate that young adults receive some benefits from gardening that differ from those noted in other studies regarding children and older adults. Participants claimed that the experience of growing and caring for their own vegetables provided them with knowledge and skills beneficial for attaining sustainability later on in their futures.

Gnilka, Ashby, Matheny, Chung, and Chang (2015) indicated that college students regularly pinpoint academics, relationships, and traumatic events as key groups of stressful events. Results from Mecham and Joiner's (2012) study indicated that the majority of participants found gardening to be a source of stress relief. Other pertinent benefits of this study included emotional benefits. Some students saw gardening, specifically pulling weeds, as a way to relieve frustrations. Others admitted to experiencing a self-esteem boost and a sense of pride and accomplishment.

A study performed at an urban community college in Los Angeles observed how gardening effected students' self-esteem, academic performance, and involvement in the

community. (Hoffman, Morales Knight, & Wallach, 2007) The results indicated that academic performances in certain areas increased among students of color who participated in the gardening program. Results also indicated that the students who worked together in the gardening program saw significant decreases in ethnocentrism and an increase in community involvement.

Many studies have shown the benefits of gardening but few have noted the attitudes and beliefs of those who took part in the study. The multitude of benefits that can be obtained from gardening will mean nothing if there is a negative opinion surrounding the activity. An even smaller number of studies has involved a population of college students as the participants of the study. The purpose of this study is to analyze the attitudes and perceptions students at Texas A&M University – Commerce have towards vegetable gardening.

Methods

The purpose of this study was to analyze the attitudes and perceptions of students at Texas A&M – Commerce regarding vegetable gardening. The objectives of the study were reflected in the following questions: (1) What effects does vegetable gardening have on students? (2) Did participants' attitudes and perceptions change after the treatment? Additionally, the following null hypothesis was developed to accomplish the purpose of this study:

Ho_1: No difference exists in attitudes and perceptions towards vegetable gardening in college students at Texas A&M University – Commerce regarding a hands-on gardening experience.

Participants

Participants in this study were found through the use of advertising via Facebook groups, word of mouth, and flier postings across the Texas A&M University – Commerce campus. Seven students volunteered to take part in the study. This was a much lower number than originally anticipated. Participants had varying degrees of experience in gardening, whether vegetable or flowerbed gardening, and had varying demographics. These differences in background and experience allowed for a more diverse sample population.

Table 1 shows the demographic questions posed in the survey along with the results for each question taken from the pretest. It should be noted that some students experienced a change in major between the pre-and posttest, though it is not noted in the table. In terms of age and gender, the students had little variance. All of the participants were female and aged between 18 and 23 years. While this area of the demographics saw little change, the remaining demographic information varies greatly.

All participants had different majors, ranging from animal science, to horticulture, to accounting, to psychology. There was a split amongst the colleges within the university. Two of the participants held majors within the School of Agriculture, two within the College of Humanities, Social Sciences, and Arts, and one each for the College of Science and Engineering, College of Business, and College of Education and Human Services.

Four of the seven participants stated that they grew up in rural towns, two in small towns, and one in an urban setting. Six students, the majority, participating in the study were Caucasian, and one Hispanic/Latino participant. The results of these demographic questions show that, while the test population was small, there was diversity amongst the participants in many aspects.

Table 1
Demographic Characteristics (N=7)

		f	%
Gender			
	Male	0	
	Female	7	100
What college does your major fall under at Texas A&M University Commerce?			
	School of Agriculture	2	28.6
	College of Science and Engineering	1	14.3
	College of Business	1	14.3
	College of Education and Human Services	1	14.3
	College of Humanities, Social Sciences, and Arts	2	28.6
Major			
	Accounting		
	Interdisciplinary Studies		
	Animal Science		
	Liberal Studies		
	Computer Science		
	Ornamental Horticulture		
	Psychology		
Race			
	Caucasian	6	85.7
	African American	0	
	Asian	0	
	Hispanic/Latino	1	14.3
	American Indian or Alaska Native	0	
	Native Hawaiian or Other Pacific Islander	0	
	Other	0	
What size town did you grow up in?			
	Urban (100,000+)	1	14.3
	Suburban (30,001 - 100,000)	0	
	Small Town (5,001 - 30,000)	2	28.6
	Rural (5,000 or less)	4	57.1
Age			
	18-23	7	100
	24-30	0	
	31-35	0	
	35+	0	
Classification			
	Freshman	1	14.3
	Sophomore	3	42.9
	Junior	2	28.6
	Senior	1	14.3
	Graduate	0	

Table 2 provides a list of questions regarding participants' experience with gardening. The questions inquire about the experience of participants in both vegetable and flowerbed gardening environments. The majority of participants, six of the seven, had previous experience working in a vegetable garden. Only five of the respondents had experience in flowerbed gardens. All of the participants stated that someone in their family had a flowerbed garden, but only five stated that a family member had a vegetable garden.

A factor that could have impacted participants' experience is hometown size. Several other factors could have attributed to the participants' experience as well, including major. A horticulture major, as is listed as one of the participants' majors in Table 1, would likely have experience based on their chosen area of study.

Table 2
Participants' Experience (N=7)

		f	%
Do you have any experience working in a vegetable garden?			
	Yes	6	85.7
	No	1	14.3
Do you have any experience working in a flowerbed garden?			
	Yes	5	71.4
	No	2	28.6
Do any of your family members have a vegetable garden?			
	Yes	5	71.4
	No	2	28.6
Do any of your family members have a flowerbed garden?			
	Yes	7	100
	No	0	

Participants had the opportunity to plant and provide continued care for the vegetables. They were also able to harvest several types of produce, such as the strawberries and herbs. Like any other garden, participants were able to experience the loss of a crop due to insects and other pests and bad weather.

Procedure

After consenting to take part in the study, participants took the pretest via SurveyMonkey.com. The pretest allowed the participants to express their attitudes towards gardening before taking part in the gardening process. The location of the study was an unlocked, fenced-in lot behind the Baptist Student Ministry just off of the Commerce campus. This building is within walking distance of residence halls, which provided potential participants living on campus a relatively short trip to the worksite.

The participants were guided through the processes of initial preparation, planting/seeding, continued care, and eventual harvest. The participants were shown how to perform the task, and then given the opportunity to perform hands-on work completing the necessary task, whether digging holes for the seeds and plants, pulling weeds, watering, or harvesting the produce. Set work days were twice weekly for five weeks, though these times were dependent upon the weather. Outside of these set times, participants were allowed to stop by and check on their crops at any time.

The plants/seeds available for use were chosen by administrators of the study to ensure that nothing was planted that could not survive the season. The plants provided included strawberries, tomatoes, chives, basil, sage, cilantro, and cucumbers. Seeds used in the study included squash, zucchini, radishes, beans, and okra.

Rather than work solely in the ground, the study made use of container gardening as well as traditional gardening. Much of the planting was done through container gardening, but some of the produce (okra, beans, and cucumbers) was planted traditionally (in the ground) along the fence row. This allowed the participants to experience two types of gardening: the traditional and

the more recently popular container gardening. Equipment such as the containers, shovels, trowels, plants/seeds, and any other gardening necessities were provided by the School of Agriculture. The Baptist Student Ministry allowed the researchers and participants to use a water source in order to water the produce.

The post-test was administered after harvest using SurveyMonkey.com. The pretest taken before the gardening began and posttest administered after harvest were identical. A panel with experience in research methodology established face and content validity for the survey. The questions and statements in the survey were chosen in order to allow the participants to explain the attitudes and perceptions they held toward vegetable gardening.

These tests made use of the Likert scale by measuring students' responses. Students responded to each question using a five-point, summated or Likert-type scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree. Other questions used the same five-point scale, with options ranging from Very Reluctant to Very Enthusiastic and Very Uninterested to Very Interested.

Also included in the pre- and posttest were basic demographic questions such as age, race, major, hometown size, and college within Texas A&M University – Commerce. Other questions regarding participants' experience with vegetable or flowerbed gardening were also included. These questions were included to show the varied experience and backgrounds of the participants.

Figure 1 shows the location and general set up of the study on the first assigned work day. Some of the equipment and seeds/plants used in the research can be seen. Planting occurred mainly in the large containers, though the fencerow on the left side of the image was also utilized for some produce which required something to climb (i.e., cucumbers).

Figure 1. Worksite and Materials

Analysis

Testing of the data was done through a paired-samples t-test, or repeated measures test. This testing was performed with the Statistical Package for the Social Sciences (SPSS). Each question or statement was tested to evaluate the effect of the treatment on the attitudes and perceptions of participants towards vegetable gardening. Table 3 provides a list of the survey questions tested through the paired-samples t-test. The questions are grouped together in this and subsequent tables based on topic similarity.

The first group of questions focuses primarily on potential benefits participants could achieve through the act of gardening. These benefits include items such as cost reduction, physical health benefits, and mental health benefits. Specifically, saving money, getting a good workout, and relieving stress.

The second set is grouped together based on attitudes or views participants held in relation to vegetable gardening. These are general thoughts about the act of gardening itself and the participants' attitudes towards gardening related activities, such as the physical requirements, knowledge requirements, overall interest, and the potential for enjoyment.

Table 3

Individual Likert Scale Questions and Statements (n = 7)

Group	Item
Perceived Benefits	Growing my own produce saves me money.
	I feel that I get a workout while gardening.
	Growing my own vegetables gives me a sense of achievement.
	Working in a garden reduces stress.
	Working in a garden is relaxing.
Attitudes	Attitude toward the opportunity to garden.
	How interested are you in gardening?
	I enjoy working outside.
	Gardening requires a large knowledge base.
	I enjoy eating fresh vegetables.
	I enjoy working with my hands.
	I enjoy watching things grow.
	Gardening is enjoyable.
	Working in a garden is time consuming.
	Working in a garden is hard work.

Table 4 illustrates the same individual Likert scale questions and statements as those in Table 3. Alongside these items are each question or statement's mean score for both the pre- and posttest and the standard deviation. The results from the t-test proved to be statistically insignificant, though some observable differences in the mean scores between the pre- and posttest questions/statements can be seen.

The statement with the largest positive change was "Gardening requires a large knowledge base." ($M_1 = 3.00$, $M_2 = 3.43$, $SD = 1.27$) There was a 0.43 increase between the pre- and posttest. This can show that, while not a statistically significant result, participants found that more knowledge was required to garden than originally expected.

Another large positive change can be seen in the statement “Working in a garden reduces stress.” ($M_1 = 4.29$, $M_2 = 4.71$, $SD = 0.98$) The difference in mean scores for this statement was 0.42. Though not statistically significant, one could draw a conclusion from this observation that after the treatment, students found gardening to relieve stress more than initially thought. This observation follows the results found from previous studies mentioned above.

The largest negative change was found in the statement “Working in a garden is time consuming.” ($M_1 = 3.86$, $M_2 = 3.57$, $SD = 0.95$) The mean scores for this statement saw a 0.29 decrease before and after treatment. The conclusion formed from this observation shows that participants found gardening to be less time consuming after taking part in the activity. This change could stem from the use of container gardening rather than traditional gardening. The four remaining negative changes were within 0.01 of one another.

Table 4
Individual Questions' and Statements' paired samples with mean scores and Standard Deviation

	Item	M_1 (Before)	M_2 (After)	*SD*
Perceived Benefits	Growing my own produce saves me money.	3.43	3.71	1.11
	I feel that I get a workout while gardening.	3.86	3.71	0.69
	Growing my own vegetables gives me a sense of achievement.	4.29	4.57	0.76
	Working in a garden reduces stress.	4.29	4.71	0.98
	Working in a garden is relaxing.	4.29	4.43	1.07
Attitudes	Attitude toward the opportunity to garden.	4.29	4.43	0.38
	How interested are you in gardening?	4.43	4.71	0.76
	I enjoy working outside.	4.29	4.14	0.90
	Gardening requires a large knowledge base.	3.00	3.43	1.27
	I enjoy eating fresh vegetables.	4.71	4.57	0.38
	I enjoy working with my hands.	4.17	4.33	0.41
	I enjoy watching things grow.	4.67	4.67	0.63
	Gardening is enjoyable.	4.43	4.71	0.76
	Working in a garden is time consuming.	3.86	3.57	0.95
	Working in a garden is hard work.	3.57	3.43	1.35

Conclusions

As stated above, the null hypothesis formed to be tested is as follows:

Ho_1: No difference exists in attitudes and perceptions towards vegetable gardening in college students at Texas A&M University – Commerce.

The overall results of this study were not statistically significant. Thus, statistically speaking, the null was proven to be true. If the sample size had been larger, the data provided from the Likert scale questions could have held statistical significance. More participants allow for more and more varied data to be seen.

While the data was not statistically significant, variances could be seen through general observations. The mean scores show that the results of the questions/statements varied between the pre- and posttest. Of the fifteen paired statements, nine showed an increase in the mean scores between the pre- and posttest, five showed a decrease, and one remained constant.

The questions researchers looked to answer through this study were as follows: What effects does vegetable gardening have on students? Did participants' attitudes and perceptions change after the treatment? As the results of the study are not significant, it is not possible to answer these questions with any form of accuracy or reliability. The general observations that can be seen in Table 2 relating to the changes in mean scores for the pre- and posttest can aid in positing possible answers, but there could be no answer backed up by statistically significant data. If performing this test in the future, some changes in methods could prove more fruitful. Recommendations for any future undertakings of this study are suggested below.

Recommendations

If this study were to be performed again, a few changes might result in more significant findings. As mentioned above, the statistical insignificance of the results could perhaps be improved with a larger test population.

Another recommendation is a longer testing period; perhaps a full or half semester, or even a summer-long study with students who are enrolled in classes during the summer. However, it could be difficult to find a large number of participants willing to commit to a full semester of garden work.

Another recommendation for future testing is the use of a control group. This would be a group that is the same as the other participants, but is not exposed to the treatment. These students would simply take the pre- and posttest without performing any gardening activities. There could be a number of factors causing changes in the attitudes and perceptions of the test population. Perhaps a student read an article about the benefits of gardening and based their answers to the survey off of their reading. A control group could help identify these types of changes.

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