Journal of Extension
www.joe.org

June 2013
Volume 51
Number 3
Article # 3RIB3

Assessing Youth Perceptions and Knowledge of Agriculture: The Impact of Participating in an AgVenture Program

Abstract

Agricultural education programs such as AgVenture have been established to educate youth about the importance of agriculture. The study reported here examined the direct impact that one agricultural education program, specifically AgVenture, had on youth perceptions and knowledge of agriculture. Youth's perceptions and knowledge of agriculture were examined using a pre-test and post-test instrument administered to fourth grade students who participated in the AgVenture program. It was concluded that the AgVenture program was significantly associated with student knowledge. Student perceptions were also affected by the activity.

Alisa Nicole Luckey
Graduate Student
Department of Agricultural Leadership, Education & Communications
aluckey@neo.tamu.edu

Theresa Pesl Murphrey
Assistant Professor
Department of Agricultural Leadership, Education & Communications
t-murphrey@tamu.edu

Richard L. Cummins
Office of the Commandant
Leadership Excellence Program
dcummins@corps.tamu.edu

Michael B. Edwards
Assistant Professor
Department of Recreation, Park and Tourism Sciences
mike.edwards@tamu.edu

Texas A&M University
College Station, Texas

Introduction

Agriculture has always been a significant factor in the sustainability and development of human society (Frick, Birkenholz, & Machtmes, 1995). Unfortunately, the important role of agriculture as a foundation for a secure and durable civilization is not always apparent to those outside of agriculture (Boleman & Burrell, 2003). Specifically, current generations of children and youth often see agriculture only in terms of narrow stereotypes—a farmer, a cow, and/or a tractor (Blackburn, 1999), with the stereotypical farmer only visualized as an old man that "wears bib overalls and chew[s] on straw" (Holz-Clause & Jost, 1995). These groups of children and youth represent the future leaders of society (Boleman & Burrell, 2003), the people we will depend on to support, regulate, and advocate for agriculture.

"Agricultural literacy is important to the future of our nation and the discipline of agriculture" (Frick & Spotanski, 1990, p. 6). Because the majority of the public is now almost completely removed from agriculture in their daily lives, it is of utmost importance that best practices in agricultural education

are identified to ensure agricultural literacy is maintained in future generations of Americans. The methods used to present agricultural education to students can greatly influence students' attitudes towards learning material (Okiror, Matsiko, & Oonyu, 2011). Riedmiller (2002) stated that the quality of a school garden or agricultural learning material is the single most important factor influencing the knowledge, skills, and attitudes of youth learning about agriculture. Ricketts and Place (2005) expressed the importance of youth "learning by doing" and the belief of allowing learners the opportunity for self-discovery learning. Research has articulated the positive benefits of agricultural education programs for individuals in a variety of situations, such as nursing home residents, prison inmates, hospital patients, and disabled individuals (Weigel, Caiola, & Pittman-Foy, 2002), and hands-on experiences with agriculture have been shown to create a significant increase in a student's knowledge (Platt, Rusk, Blomeke, Talbert, & Latour, 2008).

Gaining insight into youth perceptions of agriculture allows researchers and educators to develop methods to better educate and inform youth about agriculture. Agricultural literacy is a critical need. The cultivating of agricultural interest among youth can ultimately lead to not only a more agriculturally aware society but also a workforce to support agricultural practices that allow society to thrive (Holz-Clause & Jost, 1995).

Purpose and Methods

For 80 years, the Houston Livestock Show and RodeoTM (HLSR) has provided opportunities for youth to be involved in agricultural activities that create an awareness of the importance of agriculture. In 1997, HLSR developed an agricultural awareness exhibition named "AgVenture" to expose youth to areas of agriculture and illustrate the impact of agriculture on everyday activities (HLSR, 2011).

The exhibition includes 10 diverse areas of agriculture that enable youth to gain first-hand experiences. A birthing center is available to allow youth to observe livestock such as sows, cows, and ewes give birth. A poultry area displays the stages of a chicken's life, including hatching, growing for consumption, and reproduction. The honey bees exhibit has live honey bees producing honey. Observers are able to see how the colony of bees works together to produce honey for humans to consume and/or use to produce different by-products. The Dairy Discovery Zone provides a life-sized model cow that offers participants a hands-on milking experience. The rabbit exhibit allows participants to observe and interact with several different breeds of rabbits. The Breed Row Barn showcases different breeds of swine, cattle, sheep, and goats. The Fun on the Farm attraction allows youth to explore the world of agriculture by following Farmer Joe through the process of producing farm products—from planting to market. Youth are encouraged to help with daily chores around the farm, such as gathering eggs, planting and harvesting crops, and milking a cow. The horticultural exhibit features live earthworms that the youth are able to interact with hands-on, learning about their importance to soil and plants. The Texas Department of Agriculture's Food and Nutrition exhibit is an interactive world where children learn about the three E's of healthy living—education, exercise, and eating right. The Texas Farm Bureau exhibit depicts the history of agriculture and teaches students about the importance of cotton.

The purpose of the study reported here was to evaluate the effects of the AgVenture program on the knowledge and perceptions of agriculture among fourth grade students who attended the AgVenture

program at the 2011 Houston Livestock Show and RodeoTM (HLSR).

Elementary school students in the Houston metropolitan area were the population for the study. Fourth grade students were specifically targeted for inclusion based on recommendations from previous research (Meunier, Talbert, & Latour, 2003; Boleman & Burrell, 2003). A total of 306 fourth grade students from eight different schools were identified as potential participants. After seeking volunteers for the study and appropriate parental permission, a total sample of 41 participants in two schools agreed to participate.

Survey instruments were developed using a pre- and post-test design following a similar format used by Boleman and Burrell (2003). Both pre-test and post-test instruments included a knowledge section (i.e., 25 multiple choice questions), perceptions section, and demographics section. The perception section included 15 questions related to the student's personal perception of how agriculture affects his/her daily life and used a ranking of "Yes", "No", and "I don't know." Content validity was determined through a panel of fourth grade teachers, reading specialists, librarians, and HLSR personnel. Instrument reliability was tested using the Spearman-Brown reliability test and revealed reliability for both instruments was .610, which has been deemed acceptable for early stages of research (Nunnally, 1967). Time to complete both the pre-test and post-test instrument averaged 30-45 minutes. Data were analyzed using the SPSS Statistics Program. Institutional Review Board approval was obtained and proper protocol was followed.

Results and Discussion

Description of the Population

Of the 41 participants, 78% were female, and 22% were male; ages ranged from 9 to 11 years of age. The majority self-identified as African-American (46.3%) or Hispanic (31.7%). More than 30% of the students stated they had no prior knowledge of agriculture before attending the AgVenture program, 29.3% had previously toured a rodeo and/or stock show, 29.3% had previous contact with farm animals and/or crops more than once, and 9.8% owned farm animals and/or had grown crops with their family. Among all participants, 43.9% stated that they had previously participated in the AgVenture program at the Houston Livestock Show and RodeoTM (HLSR), 39.0% had attended the HLSR, but had not participated in AgVenture, and 17.1% had never been to the HLSR.

Agricultural Knowledge Before and After Exposure to the AgVenture Program

A paired sample t-test revealed a significant change in knowledge at the .006 level (Table 1). Cohen's d indicated a medium effect size (0.53) (Thalheimer & Cook, 2002).

Table 1.

Comparison of Pre-Test Knowledge Scores and Post-Test Knowledge Scores for Fourth Grade Students who Participated in the AgVenture Program in 2011 (N=41)

	M	*S. D.*	*t*	*p*
Pre-Test Scores	11.5610	2.88140	-2.916	.006*
Post-Test Scores	12.9756	2.48483		
Note. Significant at the .05 level.				

Agricultural Perceptions Before and After Exposure to the AgVenture Program

Student perceptions were affected through exposure to the AgVenture program (Table 2). Prior to participation in the program, 95% of the participants stated that they would like to learn more about agriculture and 90% believed that youth like themselves should learn more about agriculture. Only 34% of the participants believed that agriculture affected their daily lives, and 46% perceived agriculture as important to their community

After participation in the program, 90% of the participants wanted to learn more about agriculture, and 90% felt that it is important for students like themselves to learn more about agriculture. While interest in agriculture seemed to remain unchanged or declined among participants from pre- to post-tests, appreciation of agriculture increased with exposure to AgVenture, with 61% perceiving agriculture affecting their daily lives (27% increase) and 73% believing that agriculture was important to their community (27% increase).

Table 2.

Summary of "Yes" Responses to Agricultural Perception Statements by Respondents (N=41)

	Pre	*Post*	*Difference (Post-Pre)*
Perception Statement	*%*	*%*	*%*
Agriculture is a part of my everyday life.	59	66	+7
Agriculture impacts me daily.	34	61	+27
Agriculture is important to my community.	46	73	+27
I feel that it is important to youth like me to learn about agriculture.	90	90	-
I liked my school tour to the Houston Livestock Show & Rodeo.	93	95	+2
I would like to learn more about agriculture.	95	90	- 5
I would like to work in agriculture.	51	44	- 7

There are many jobs in the area of agriculture.	56	66	+10
Shelter is a result of agricultural practices.	44	39	- 5
Agriculture is an interesting topic.	85	85	-
I have observed agriculture in action.	61	76	+15
Food is a result of agricultural practices.	63	63	-
Clothing is a result of agricultural practices.	39	59	+20
Note. Respondents could select "Yes," "No," or "I don't know." Only "Yes" responses are reported. Percentages were rounded to whole numbers.			

As part of the post-test instrument, participants were asked which portion of the AgVenture program they had learned the most from as well as which portion of the program had been the most fun. The Birthing Center (n=12; n= 9) and the Fun on the Farm (n=12; n=16) exhibits received the highest response in relation to learning and fun.

Conclusions

Participants' agricultural knowledge increased following their participation in the AgVenture program. It is possible that prior lack of agricultural literacy was a result of the fact that 31.7% of the participants reported that they had no previous agriculture experience. Based on the finding that only 34% of the participants believed that agriculture affected them, it can be concluded that many of the participants did not possess a deep understanding of the role that agriculture plays in society. However, prior to participation in AgVenture, the majority of participants were interested in learning about agriculture.

Participants indicated that they "learned the most from" the exhibits that had active hands-on involvement in the program as indicated in their identification of the Birthing Center exhibit and Fun on the Farm exhibit as the most educational and fun. In addition, study findings indicated an increase in fourth grade students' knowledge about basic agriculture, thus increasing agricultural literacy levels among youth. Findings indicate that the interactive activities enabled students to relate to agriculture, therefore heightening their interest in agriculture and increasing their opportunity for self-discovery. These finding are similar to those of Ricketts and Place (2005), who reported hands-on activities as making students more receptive to learning.

It was further concluded that participation in the AgVenture program had a positive effect on student perceptions of agriculture; however, it was also concluded that the awareness of agriculture through the AgVenture program did not stimulate interest in agriculture and actually caused participants to question whether or not they would want to work in agriculture. In fact, it is possible that this exhibit could have inadvertently perpetuated the stereotype of agriculture being limited to production agriculture.

Recommendations

Significant time, effort, and funds are expended to implement agricultural education programs for

youth. Based on the study reported here, it is recommended that future agricultural education intervention programs for fourth grade students continue to include hands-on activities designed to increase knowledge of basic agriculture-related concepts. However, it is also recommended that additional exhibits be added that emphasize the breadth and depth of the agricultural industry. It is critical that youth learn not only about production agriculture but also about agricultural technologies, alternative production methods, and local and urban agriculture.

Programs such as the one evaluated have the potential to influence agricultural literacy by allowing students to explore the complexity of agriculture and how it affects their everyday life. This exploration must include aspects beyond production agriculture in order to avoid perpetuating the stereotypes that exist. The AgVenture program could be improved through the inclusion of aspects that create a more broad-based understanding of careers in agriculture. It is recognized that a limitation of the study was the small number of participants who completed the pre- and post-instruments. In addition, given the small number, it was not possible to compare students who had prior AgVenture experience and those who did not. However, given that the respondents were an ethnically diverse group, the study adds to the literature regarding agricultural literacy.

Additional program improvement could be achieved by extending programs such as the one studied to include in-school visits and follow-up materials and sessions. These mechanisms would allow youth to continue their agricultural education beyond the activity itself. Educators must understand that not all youth have an interest in learning about agriculture. Relevance will be a key factor in gaining the interest of youth. It is recommended that educators and program leaders demonstrate the connection between agriculture and youth using interconnected examples that have relevance. One example would be the making the connection between items such as tennis shoes and basketballs being made from a cow's hide. Educational materials should promote both the technical aspects of agriculture and the vast career opportunities in agriculture.

The study reported here provided insight into understanding how an important age group (i.e., fourth grade students) reacts to and benefits from participation in an agricultural education program and adds to the body of research related to agricultural literacy and society's perceptions of agriculture.

References

Blackburn, D. A. (1999). Ag science fairs: The next wave in agricultural literacy. *Journal of Extension* [On-line], 37(4), Article 4TOT1. Available at: http://www.joe.org/joe/1999august/tt1.php

Boleman, C. T., & Burrell, F., Jr. (2003). Agricultural science fairs: Are students truly learning from this activity? *Journal of Extension* [On-line], 41(3), Article 3RIB4. Available at: http://www.joe.org/joe/2003june/rb4.php

Frick, M. J., Birkenholz, R. J., & Machtmes, K. (1995). Rural and urban adult knowledge and perceptions of agriculture. *Journal of Agricultural Education*, 36(2), 44-53.

Frick, M., & Spotanski, D. (1990). Coming to grips with agricultural literacy. *The Agricultural Education Magazine*, 62(8), 6-13.

Holz-Clause, M., & Jost, M. (1995). Using focus groups to check youth perceptions of agriculture.

Journal of Extension [On-line], 33(3), Article 3FEA3. Available at: http://www.joe.org/joe/1995june/a3.php

Houston Livestock Show and RodeoTM (HLSR) Website. (2011). *CapitalOne Bank AgVenture.* Retrieved from: http://www.rodeohouston.com

Meunier, R. A., Talbert, B. A., & Latour, M. A. (2003). Evaluation of the Incubators in the Classroom program: Does it increase fourth grade students' knowledge of agriculture-related science concepts? *Journal of Agricultural Education*, 43(3), 49-60.

Nunnally, J. C. (1967). *Psychometric theory*. New York: McGraw-Hill Book Company.

Okiror, J. J., Matsiko, B. F., & Oonyu, J. (2011). Just how much can school pupils learn from school gardening? A study of two supervised agricultural experience approaches in Uganda. *Journal of Agricultural Education*, 52(2), 24-35.

Platt, J. C., Rusk, C. P., Blomeke, C. R., Talbert, B. A., & Latour, M. A. (2008). A comparison of evaluation of digital versatile disc (DVD) instruction and live instruction in third grade classrooms. *NACTA Journal*, 52(1), 2-5.

Ricketts, K. G., & Place, N. T. (2005). Cooperation between secondary agriculture educators and extension agents. *Journal of Extension* [On-line], 43(6), Article 6FEA6. Available at: http://www.joe.org/joe/2005december/a6.php

Riedmiller, S. (2002). Primary school agriculture: What can it realistically achieve? Entwicklung und Laendlicher Raum, 3(28), 9-13. Available at: http://www.fao.org/sd/2002/KN0701a_en.htm

Thalheimer, W., & Cook, S. (2002). *How to calculate effect sizes from published research: A simplified methodology*. Work-Learning Research. Retrieved from: http://education.gsu.edu/coshima/EPRS8530/Effect_Sizes_pdf4.pdf

Weigel, R. R., Caiola, B., & Pittman-Foy, L. (2002). 4-H animal care as therapy for at-risk youth. *Journal of Extension* [On-line], 40(5), Article 5IAW6. Available at: http://www.joe.org/joe/2002october/iw6.php

---