The Agricultural Knowledge and Perceptions of Incoming College Freshmen at a Land Grant University

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Abstract

As people have moved away from rural America toward urban areas, they have become deficient in their agricultural knowledge. Fortunately, the land grant universities exist to teach people about agriculture. Yet, identifying the agricultural knowledge and perceptions people bring to the university is important to knowing how to improve their understanding. The purpose of this study was to identify the demographic makeup of incoming freshmen at Oklahoma State University and determine how their previous experiences in agriculture, or lack of, shaped their knowledge of the agricultural, food, and fiber industry. The study found that people who identified as growing up in rural areas outperformed those who did not. In addition, those who had experiences in FFA and 4-H programs outperformed those who did not. Overwhelmingly, the participants agreed that agriculture is fundamental to U.S. national security. Three-fourths of the participants strongly agreed that agriculture plays a key role in society. In all, 40% agreed that they would like to learn more about the agricultural industry, and 61% agreed it was very or extremely important for students at Oklahoma State University to take a general education course about agriculture.

Introduction

Increased "modernization and urbanization" has created a disconnect between the U.S. population and agriculture (Powell and Agnew, 2011, p. 155). Subsequently, people lack basic knowledge of their food and fiber system (Blackburn, 1999; Frick et al., 1995; Kovar and Ball, 2013), which results in a lack of basic agricultural literacy (Dale et al., 2017). In 2008, for the first time ever in U.S. history, the population in urban settings outnumbered that in rural settings (Brown and Kelsey, 2013). This major shift implies people are further removed from the land and consequently agriculture and thus are not prepared or equipped to make important decisions regarding issues involving agriculture (Kovar and Ball, 2013). Today, less than one percent of the U.S. population farm as their livelihood (Environmental Protection Agency, 2012). Efforts must be made to educate the public about agriculture and natural resources (Doerfort, 2011; National Research Council [NRC], 1988), as it is imperative for society to prosper, especially regarding future decisions that will affect U.S. food and fiber system (Pense and Leising, 2004; NRC, 1988).

Frick et al. (1991) conducted a Delphi study with 100 panelists to identify agricultural concepts that all citizens should know. The panel identified 11 subject areas:

(a) agriculture's important relationship with the environment, (b) processing of agricultural products, (c) public agricultural policies, (d) agriculture's important relationship with natural resources, (e) production of animal products, (f) societal significance of agriculture, (g) production of plant products, (h) economic impact of agriculture, (i) marketing of agricultural products, (j) distribution of agricultural products, and, (k) global significance of agriculture. (p. 50)

Although efforts have existed to include these areas in K-12 education, little has been done to monitor the agricultural literacy of students at the post-secondary level (Colbath and Morrish, 2010; Kovar and Ball, 2013). Wilkins et al. (2000) assessed university students regarding their knowledge about seasonal and local foods. Although nearly 75% of students had some level of familiarity with the terms, only 25% used the terms accurately to describe food.

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With more of the population moving to urban areas (Brown and Kelsey, 2013), where are students learning about agriculture? Unfortunately, gaps in knowledge about food exist, especially in urban settings (Holz-Clause and Jost, 1995), as do the attitudes people have regarding food production, safety, and sustainability (Harmon and Maretzki, 2006; Holz-Clause and Jost, 1995). Therefore, a need existed to determine what incoming freshmen students knew and perceived about the agricultural industry.

This study was grounded in the human capital theory. Human capital is defined as the investment in a person's knowledge, skills, and experiences, which are necessary for increasing learning, becoming employable, and improving an individual's overall well-being as a citizen (Becker, 1964; Little, 2003; Shultz, 1971; Smith, 2010). Human capital can be accumulated in various ways, such as attending school; participating in a variety of activities; training on-the-job (i.e., interning); or studying about global phenomena (Becker, 1962). In addition, human capital is based on a person's attitudes, beliefs, perceptions, and experiences (Scoones, 2000) regarding a specific phenomenon.

Braverman and Rilla (1991) stated that educating adults to be agriculturally literate is a main concern for the entire agricultural industry. Unfortunately, a lack of agricultural literacy may result in an uninformed civic majority being involved in important policy decisions inhibiting the agricultural industry's ability to operate well in an increasingly competitive world market (Hess and Trexler, 2011; NRC, 1988). Specifically, this study focused on human capital in terms of students' knowledge (Becker, 1964; Little, 2003; Smith, 2010) in and about agriculture (NRC, 1988).

Purpose of the Study

The purpose of the study was to identify the demographic makeup of incoming freshmen at Oklahoma State University and determine how their previous experiences in agriculture, or lack of, shaped their perceptions and knowledge of the agricultural, food, and fiber industry. Two objectives guided this study:

1. Describe selected personal characteristics (i.e., students' geographic location and home community size, high school participation in youth leadership organizations, and courses taken in agricultural education) that impacted students' agricultural knowledge and perceptions.
2. Compare students' agricultural knowledge, as determined by test results on a criterion-referenced examination, by selected personal characteristics.

Materials and Methods

A condensed version of Pense's and Leising's (2004) Food and Fiber Systems Literacy (FFSL) instrument was used to acquire students' basic knowledge of the agricultural industry. This criterion-referenced test measured students' knowledge of agriculture in five distinct areas: 1). understanding food and fiber systems, 2). history, geography and culture, 3). science, technology and environment, 4). business and economics, and 5). food, nutrition and health.

This descriptive study's target population consisted of all incoming freshmen students who were at least 18 years old (*N*=4,081) at Oklahoma State University during the Fall semester of 2012. Oklahoma State University is made up of six colleges, which for this census study were considered the students' disciplines. The six colleges were the College of Agricultural Sciences and Natural Resources (CASNR); College of Arts and Sciences (A&S); Spears School of Business (SSB); College of Education (COE); College of Engineering, Architecture, and Technology (CEAT); and Human Sciences (HS). A total of 185 different majors and options are offered across campus (Oklahoma State University, 2013).

Regarding the entire population of the incoming freshmen class, 2,110 were females (IRIM, 2012). The average high school core GPA was a 3.58 with 92% of incoming freshmen holding a 3.00 to 4.00 GPA (IRIM, 2012). Sixty-three percent of the new freshmen were Oklahoma State University residents (IRIM, 2012). The number of new freshmen enrolled by college in the Fall semester of 2012 was 425 in COA; 972 in A&S; 586 in COB; 290 in COE; 857 in CEAT; and 291 in CHS. In addition, 868 students were enrolled in the Learning and Student Success Opportunity Center (LASSO) (IRIM, 2012) (see Table 1). Data from the LASSO Center were not included in Table 1 below because it is not an academic college within the university; rather, it is where incoming students can receive additional academic advising without declaring a specific major (LASSO Center, 2013).

The number of degrees offered in the 2012-2013 academic year in each college were 59 in COA; 62 in A&S; 16 in COB; 25 in COE; 25 in CEAT; and 14 in CHS (Oklahoma State University, 2013). The number of undergraduate degrees granted by each college between the years of 2007 and 2012 were 2,168 from COA; 4,806 from A&S; 5,047 from COB; 1,995 from COE; 2,349 from CEAT; and 2,018 from CHS (IRIM, 2012) (see Table 1).

To improve response rate, four contacts were made to the population requesting their participation in the study (Dillman, 2007). However, of the 4,081

Table 1. Descriptions of Specific Variables Describing Freshmen Enrolled in the Six Colleges of Oklahoma State University

	College[a]					
	CASNR	A&S	SSB	COE	CEAT	HS
New Freshmen Enrolled in Fall Semester of 2012	425	972	586	290	857	291
Degrees Offered in the 2012-2013 Academic Year	59	62	16	25	25	14
Undergraduate Degrees Granted 2007 to 2012	2,168	4,806	5,047	1,995	2,349	2,018

Note: [a]CASNR = College of Agricultural Sciences and Natural Resources; A&S = Arts and Sciences; SSB = Spears School of Business; COE = College of Education; CEAT = College of Engineering and Architectural Technology; CHS = Human Sciences

incoming freshmen students, only 711 responded to the questionnaire. Of those, only 500 complete data sets existed, resulting in a 12.25% response rate. To control for non-response error, early and late respondents were compared based on their personal characteristics (Miller and Smith, 1983).

When assessing students' self-reported high school grade point averages (GPAs) for early and late respondents, no statistically significant differences were found (*P*=0.66) (see Table 2). Further, when comparing home community size, no statistically significant differences existed (*P*=0.86). To clarify community sizes, definitions were necessary. According to the National Center for Education Statistics (2013), rural was defined as a *"[t]erritory that is more than 10 miles from an urban cluster (town) and more than 25 miles from an urbanized area"*; suburb was defined as a *"[t]erritory outside a principal city and inside an urbanized area"*; town was defined as a *"[t]erritory inside an urban cluster that is less than 35 miles from an urbanized area"*; and city was defined as a *"[t]erritory inside an urbanized area inside a principal city with a population of 100,000 or greater"* (para. 38). With these definitions in mind, the t-test revealed that students representing equal amounts of community sizes participated in the study (see Table 2). According to Miller and Smith (1983), because no differences were detected amongst the respondents, the data may be generalized to the entire population of incoming freshmen students at Oklahoma State University.

This study was part of a larger research project designed to understand better the agricultural literacy of incoming freshmen at a land grant university. It was revealed that 63% of the participants were female, and 83% self-identified their ethnicity as white (Dale et al., 2017). Further, the former study focused on comparing students' agricultural literacy levels across colleges, according to Food and Fiber Literacy Systems (FFLS) themes (Dale et al., 2017). The FFSL tested students' knowledge in five themes (Pense and Leising, 2004). It was validated by a panel of experts and deemed reliable if considering the factors identified by Wiersma and Jurs (1990) and a Kuder/Richardson-20 (KR-20) test, which produced a reliability coefficient of 0.85.

The findings of the larger study revealed that students representing the COA statistically significantly outperformed their counterparts in other colleges; however, their knowledge score on the FFLS was barely passing (i.e., 61%). Thus, it was found that all students had a weak understanding of agricultural literacy. As such, the importance of learning more about these students' personal characteristics and how they impacted FFSL test results is imperative for *"demonstrating the impact of agricultural literacy efforts on a variety of stakeholder behavior,"* to address research priority one of the American Association for Agricultural Education's Research Priority Areas (Doerfert, 2011, p. 8).

Table 2. T-Tests Summary and Frequencies Comparing Early and Late Respondents' Personal Characteristics

	Early Respondents		Late Respondents		
	f	%	f	%	P
High School GPA					0.66
4.00 – 3.50	129	74.1	92	73.6	
3.49 – 3.00	35	20.1	30	24.0	
2.99 – 2.50	10	5.7	3	2.4	
Home Community Size					0.86
Rural	42	24.0	31	25.0	
Suburb	47	26.9	25	20.2	
Town	47	26.9	37	29.8	
City	39	22.3	31	25.0	

Results

Objective one sought to describe the selected personal characteristics (i.e., students' geographic location and home community size, high school participation in youth leadership organizations, and courses taken in agricultural education) that impacted students' agricultural knowledge and perceptions. The total number of in-state students was 286 (66.5%) (see Table 3). Regarding the size of students' home communities, 124 (23.4%) self-reported that they resided in a city, 135 (25.5%) in a suburb, 152 (28.7%) in a town, and 118 (22.3%) in a rural area (see Table 3).

When considering the organization(s) in which students participated during high school, 128 (31.1%) reported being in FFA, and 67 (16.3%) reported being in 4-H. In addition, 25 (6.1%) were in an environmental club, 49 (11.9%) participated in science club, 115 (28.0%) competed on an academic team, and 27 (6.6%) joined the debate team (see Table 4).

Regarding the number of agricultural education courses taken by students in high school, 371 (69.9%) reported they had not taken a course, 49 (9.2%) took one course, 24 (4.5%) took two courses, 19 (3.6%) took

Table 3. Personal Characteristics of Incoming Freshmen at Oklahoma State University, Fall Semester of 2012

	f	%
Home State (*n*=430)		
In-state	286	66.5
Out-of-State	144	33.5
Home Community Size (*n*=529)		
City	124	23.4
Suburb	135	25.5
Town	152	28.7
Rural	118	22.3

Table 4. High School Participation in Youth Organizations of Incoming Freshmen at Oklahoma State University, Fall Semester of 2012 (n=411)

	f	%
FFA	128	31.1
4-H	67	16.3
Environmental Club	25	6.1
Science Club	49	11.9
Academic Team	115	28.0
Debate Team	27	6.6

Table 5. Number of Secondary Agricultural Education Courses Taken by Incoming Freshmen at Oklahoma State University, Fall Semester of 2012 (n=463)

	f	%
0 courses	371	69.9
1 course	49	9.2
2 courses	24	4.5
3 courses	19	3.6
4 courses	68	12.8

three courses, and 68 (12.8%) indicated taking four courses (see Table 5).

Objective two sought to compare agricultural knowledge, as determined by test results on a criterion-referenced examination, by selected personal characteristics. Regarding students' perceptions of their knowledge about agriculture, 65 (8.9%) considered themselves as above average, 364 (49.9%) regarded themselves as average, and 300 (41.2%) perceived themselves as below average (see Table 6). When considering the statement, Agriculture plays an important role in U.S. society, 396 (74.9%) strongly agreed, 117 (22.1%) agreed, 13 (2.5%) neither agreed nor disagreed, and 3 (0.6%) disagreed.

As for the question, *"How important is agriculture as a fundamental aspect of our national security?,"* 203 (38.4%) perceived it to be extremely important, 241 (45.6%) found it to be very important, 76 (14.4%) noted it to be neither important nor unimportant, 6 (1.1%) thought it to be very unimportant, and 3 (0.6%) perceived it to be not important at all (see Table 7). In response to the question, *"How important is it for students to take a general education course over agriculture, food, and fiber?,"* 111 (21.0%) considered it to be extremely important, 213 (40.3%) thought it was very important, 189 (35.7%) found it to be neither important nor unimportant, 12 (2.3%) perceived it to be very unimportant, and 4 (0.8%) viewed it as not being at all important (see Table 7).

Finally, regarding the question, *"Would you like to learn more about agriculture as a student at Oklahoma State University?,"* 211 (40.0%) responded yes, 235 (44.5%) indicated maybe/not sure, and 82 (15.5%) responded no (see Table 8).

Table 6. Agricultural Perceptions of Incoming Freshmen at Oklahoma State University, Fall Semester of 2012

	f	%
How knowledgeable do you consider yourself to be about agriculture?		
Above average	65	8.9
Average	364	49.9
Below average	300	41.2
Agriculture plays an important role in U.S. society.		
Strongly agree	396	74.9
Agree	117	22.1
Neither agree nor disagree	13	2.5
Disagree	3	0.6

Table 7. Perceptions of Incoming Freshmen at Oklahoma State University Regarding the Importance of Learning about Agriculture, Fall Semester of 2012

	f	%
How important is agriculture as a fundamental aspect of our national security?		
Extremely important	203	38.4
Very important	241	45.6
Neither important nor unimportant	76	14.4
Very unimportant	6	1.1
Not at all important	3	0.6
How important is it for students to take a general education course over agriculture, food, and fiber?		
Extremely important	111	21.0
Very important	213	40.3
Neither important nor unimportant	189	35.7
Very unimportant	12	2.3
Not at all important	4	0.8

A statistically significant difference was found between students' test scores and size of their home community $F(3, 500)=2.91$, $P=0.03$ (see Table 9). Specifically, statistically significant differences were noted between town ($M=14.52$) and city ($M=13.23$) ($P=0.01$) and rural ($M=14.25$) and city ($M=13.23$) ($P=0.04$). The practical significance can be observed by the mean differences found between city and town ($MD=1.29$) and city and rural ($MD=1.02$) (see Table 10).

An independent-samples t-test was conducted to compare test scores of students who did not take agriculture courses in high school with those who did (see Table 11). A statistically significant difference in scores was found ($P=0.01$) for students who took agriculture courses in high school ($M=14.63$, $SD=3.45$) and students who did ($M=13.72$, $SD=3.85$).

A statistically significant difference was found between students' test scores and their perceived previous knowledge of agriculture $F(2, 504)=15.58$, $P=0.00$ (see Table 12). Specifically, statistically significant differences were revealed between students who rated their knowledge above average (M =17.48) and average ($M=14.23$) ($P=0.00$), above average ($M=17.48$) and below average ($M=13.04$) ($P=0.00$), and average ($M=14.23$) and below average ($M=13.04$) ($P=0.02$). The practical significance can be observed by the mean differences found between above average and average ($MD=3.25$), above average and below average ($MD=4.44$), and average and below average ($MD=1.19$) (see Table 13).

Table 8. Perceptions of Incoming Freshmen in Regard to Learning About Agriculture while a Student at Oklahoma State University, Fall Semester of 2012

	f	%
Would you like to learn more about agriculture as a student at Oklahoma State University?		
Yes	211	40.0
Maybe/Not sure	235	44.5
No	82	15.5

Table 9. Analysis of Variance Summary Comparing Students' Test Scores by Size of Home Communities, Fall Semester of 2012

	SS	*df*	*MS*	*F*	*P*
Home Community Size	123.01	3	41.0	2.91	0.03*
Error	7039.85	500	14.8		
Total	7162.86	503			

*$P<0.05$.

Table 10. A Comparison of Students' Test Scores by Size of Home Communities during the Fall Semester of 2012

	Rank	*f*	%	*M*	*SD*
1	Town	141	28.0	14.52	3.51
2	Rural	114	22.7	14.25	3.82
3	Suburb	128	25.3	13.75	3.84
4	City	121	24.0	13.23	3.83

Table 11. Comparison of Agricultural Courses Taken by Students and Their Test Scores Using a t-Test, Fall Semester of 2012

	n	*M*	*SD*	*t*	*P*
No agricultural courses taken	355	13.72	3.85	-2.49	0.01*
Agricultural courses taken[a]	148	14.63	3.45		

Note: [a]The range of courses students could have selected was zero to four; *$P<0.05$.

Table 12. Analysis of Variance Summary Comparing Students' Test Scores and Perceptions of Their Previous Knowledge of Agriculture, Fall Semester of 2012

	SS	*df*	*MS*	*F*	*P*
Perception	840.24	2	420.12	15.58	0.00*
Error	135492.67	504	26.97		
Total	14432.90	506			

*$P<0.05$.

Table 13. A Comparison of Student Test Scores by Their Previous Knowledge of Agriculture during the Fall Semester of 2012

	Rank	*f*	%	*M*	*SD*
1	Above average	54	10.9	17.48	11.61
2	Average	258	50.4	14.23	3.72
3	Below average	195	38.7	13.04	3.93

An independent-samples t-test was conducted to compare test scores in non-membership in FFA and membership in FFA (see Table 14). A statistically significant difference in test scores (P=0.00) for membership in FFA (M=14.79, SD=3.29) and non-membership in FFA (M=13.70, SD=3.88) was found.

An independent-samples t-test also was conducted to compare test scores in non-membership in 4-H and membership in 4-H (see Table 15). A statistically significant difference in scores (P=0.02) for membership in 4-H (M=14.99, SD=3.13) and non-membership in 4-H (M=13.83, SD=3.82) was found. Finally, no statistically significant difference was found between students' future career aspirations and their test scores (see Table 16).

Conclusions

The typical freshman student at Oklahoma State University during the Fall semester of 2012 was a white female from Oklahoma who held a 3.50 to 4.00 high school GPA and had not taken a high school agricultural education courses. In terms of the size of their home communities, students were distributed evenly amongst city, suburb, town, and rural. Students hailing from rural communities represented the smallest category, and those who selected the category, city, represented the highest percentage of respondents, which supports the general trend that the U.S. populace is moving to urban areas (Brown and Kelsey, 2013), even in this rural state. The freshmen students in this study were involved in various high school activities, although no specific club or organization dominated among all students.

A statistically significant difference was noted between city and town and city and rural with students from a city scoring lower than those from a home community size equivalent to a town or rural. This finding supports other research (Frick et al., 1995; Harmon and Maretzki, 2006) that found rural high school students outscored the urban, inner-city students on a test of agricultural knowledge. A possible explanation for this might be the fact that rural students have had additional opportunities to experience agriculture firsthand when compared to their urban counterparts.

Students who did not take agriculture courses in high school scored significantly lower than students who were enrolled in agriculture courses in high school.

Table 14. Comparison of Membership in FFA and Students' Test Scores Using a t-Test, Fall Semester of 2012

	n	*M*	*SD*	*t*	*P*
Not a member in FFA	384	13.70	3.88	-3.03	0.00*
Member in FFA	121	14.79	3.29		

*$P<0.05$.

Table 15. Comparison of Membership in 4-H and Students' Test Scores Using a t-Test, Fall Semester of 2012

	n	*M*	*SD*	*t*	*P*
Not a member in 4-H	440	13.83	3.82	-2.33	0.00*
Member in 4-H	65	14.99	3.13		

*$P<0.05$.

Table 16. Comparison of Future Career Aspirations and Students' Test Scores Using a t-Test, Fall Semester of 2012

	n	*M*	*SD*	*t*	*P*
Not agriculturally related	388	13.82	3.93	-1.62	0.11
Agriculturally related	98	14.51	3.00		

This finding supports previous research (Colbath and Morrish, 2010, Terry et al., 1992; Wright et al., 1994) that found students who took classes in secondary agriculture or had agricultural experiences through an agricultural organization possessed more agricultural literacy than those who did not. Similarly, a statistically significant difference existed in scores for those students who participated in FFA or 4-H during high school and those who did not. This finding is also consistent with other research (Harmon and Maretzki, 2006).

Those students who perceived their previous agricultural knowledge as above average outscored students who viewed their previous agricultural knowledge as average or below average. Moreover, the students who perceived their previous agricultural knowledge as average outscored those students who perceived their previous agricultural knowledge as below average. This finding supports the basic tenants of Bandura's (1977) self-efficacy theory that suggests people perform better when their confidence is higher. Other researchers (Hoy and Spero, 2005) indicated that people tend to overestimate their actual abilities to perform tasks. However, the participants' perceptions in this study were accurate regarding their knowledge of agriculture, based on their test scores.

Because investing in human capital leads to higher levels of employability, especially when that knowledge is sector specific (Scoones, 2000), it was important to determine if students who aspired for employment in the agricultural industry outscored those who did not. Somewhat surprisingly, no statistically significant difference was found between students who had agriculturally related career aspirations and those who did not.

Recommendations for Future Research

Because it is important to know the human capital that students bring to the university, this study focused on the agricultural literacy of incoming freshmen students. However, what impact does a four-year degree have on students' agricultural literacy? The land grant mission exists to inform students about agriculture (Committee on the Future of Land Grant Colleges of Agriculture

[CFLGCA] and NRC, 1995). Is this goal achieved? This study should be replicated with exiting seniors to determine the acquisition of agricultural knowledge during students' undergraduate careers. In addition, the study should be conducted with students at the end of each year of their academic preparation, for longitudinal purposes, to determine the growth, or lack thereof, that has ensued.

Because human capital served as the conceptual framework for this study, it is important to note that only knowledge (i.e., education) and perceptions were tested; however, human capital is also measured by a person's skills and experiences (Becker, 1964; Little, 2003; Shultz, 1971; Smith, 2010). Therefore, research should be conducted to explain better the role those components play in building a person's human capital. Due to the fact emotions, or the affective domain, plays a big part in determining the type of knowledge people acquire about a specific subject, the agricultural industry should attempt to measure the effect that certain emotional experiences in agriculture have on peoples' knowledge of agriculture (Lamia, 2010; Nordstrom et al., 2000).

Recommendations for Future Practice

It is evident from the study's findings that the dissemination of agricultural literacy is still a work in progress. Efforts to educate and inform citizens about agriculture must exist at all levels of education, including post-secondary institutions. Therefore, a course focusing on agricultural literacy could be developed at the college level for non-agricultural majors. Another approach to infusing agricultural literacy would be through an integrative approach to existing courses. As such, faculty in colleges of agriculture should consider assisting their colleagues on how agricultural content can complement existing course offerings.

Because higher education administrators continue to feel the pressure to ensure college students graduate in four years, creating a standalone, agricultural literacy course as part of the general education curriculum for undergraduates may not be feasible. However, with the advent of massive online open courses (MOOCs), a badge or certificate could be offered to those individuals who wish to take an online course regarding agricultural literacy. Due to the expectations of providing extension and outreach (CFLGCA, and NRC, 1995), land grant universities are poised to offer such a course with an inward or resident student orientation.

Implications and Discussion

In the early decades of American history, most of the population lived in rural areas, and students were exposed more to agriculture during their schooling (Van Scotter, 1991). Moreover, curriculum was rich with agricultural references and examples because farming was a common aspect of almost every student's life (True, 1929). In 1790, 93% of the U.S. population was rural and most were farmers (Tauger, 2011). However, today, with the population moving to more urban settings, the importance of teaching agricultural principles is perhaps more important than ever before. The findings that students who had experienced agricultural education, through school-based agricultural education/FFA and/or 4-H, were more agriculturally literate than those who had not provides rationale for society's continued support of such programming. Yet, for various reasons, not every student has access to enrolling in youth agricultural organizations such as FFA and 4-H. Therefore, additional educational opportunities are needed.

Land grant universities exist, in part, to teach people about agriculture (NRC, 1995) and must continue to respond to that call. For some students, attending a land grant university may be as close as they will ever be to agriculture. While there, it is imperative they increase their human capital by learning basic knowledge about the agricultural industry so they can make informed decisions on the food, fiber, and natural resources industry and its effect on people in the United States and across the world.

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