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Are Agriculture Students More Career Ready? A Comparative Analysis of Illinois Juniors

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Abstract

In a state facing broad budget shortfalls, agricultural education programs have to show their value in relation to other key subject areas, such as math and reading. The best agricultural education programs follow a three-component model of instruction, including classroom experience, leadership development through FFA involvement, and an experience-based activity through a Supervised Agricultural Experience program (SAE). Each year state FFA associations recognize top chapters with gold or silver emblem designations. In this quantitative study, we compare eleventh grade Illinois agriculture students from Gold and Silver Emblem FFA chapters to all other Illinois eleventh-grade students on ACT WorkKeys assessments designed to measure levels of career readiness. In addition, we also provide a comparison of Illinois agriculture students from Gold and Silver Emblem FFA chapters to all juniors tested from the same schools. The assessment results indicated that the selected group of agriculture students are more career ready than their peers, particularly in the area of math.

Keywords: career readiness; agricultural education

Introduction

Agricultural education has embodied a strong work ethic and a drive for action since its earliest days as evidenced both by The FFA Creed and Motto. FFA's focus on learning through doing helped to facilitate and solidify the model currently used in agricultural education instruction. The best practices model of instruction in agricultural education has involved a three-component structure that incorporates classroom engagement, FFA involvement, and Supervised Agricultural Experience (SAE) (Dailey, Conroy, & Shelley-Tolbert, 2001; Dyer & Williams, 1997; National FFA Organization, 2012; National Research Council, Board on Agriculture, Committee on Agricultural Education in Secondary Schools, 1988; Rubenstein & Thoron, 2014; Rubenstein & Thoron, 2015; Talbert, Vaughn, & Croom, 2005). The three-component model of agricultural education provided the basis for career readiness through an integrated experience for students by providing work-place skills, leadership development, and an application of academic material (Roberts & Ball, 2009).

Illinois currently faces unprecedented budgeting challenges, and because of this, state agencies, including the Board of Education, face an uncertain prospect in terms of state funding. This has forced school districts to analyze the capacity of all programs to determine academic validity. The push for students in the United States to become college and career ready has become

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a target for schools and communities (United States Department of Education [USDE], 2010). As agricultural education programs are identified by its best practices of integration with academic core curriculum and real-world work applications, the comparison of ag vs non-ag students on college and career readiness standards may serve to validate the effectiveness of the programs. In the state where this study took place, the ACT and ACT WorkKeys assessments are used as part of required state testing for all juniors (Forness, personal communication, June 25, 2012). The ACT assessment series is a readily accepted standard for measuring college and career readiness (ACT, 2010a; ACT 2012a; Robbins, Allen, Casillas, Peterson, & Le, 2006). This study examines the ACT WorkKeys assessment scores of students from agriculture programs and their peers. A comparison of college readiness assessment scores, through the use of the general ACT college readiness examination, was conducted in a related study by Mouser, Sheng, Thoron, Baker, and Bacon (2017).

Related to the guidance from the USDE (2010), the Center for Best Practices (2010) pointed out that this emphasis on college and career readiness has also been a focus related to the development of the Common Core State Standards. In addition to offering a standardized exam for college preparedness, the ACT organization developed the WorkKeys assessments to measure workplace academic competencies (ACT, 2010b, 2010c). The No Child Left Behind legislation (No Child Left Behind Act of 2001, 2002) required that each state provide a method for assessing student achievement, and the state of Illinois chose to use the ACT WorkKeys Assessments for applied mathematics and reading for all grade 11 students (ACT, 2012b; ISBE, 2011). As school districts look to assess the level of academic validity of programs, agricultural education programs must find a way to prove academic merit and contribution to college and career readiness.

The ACT WorkKeys assessments measure the level of workplace proficiency demonstrated by students. The WorkKeys examinations provide a career readiness scaled score to indicate the level of proficiency that a tested student demonstrates in the areas of applied mathematics, reading for information, and locating information. Employers use these examinations as a screening process to determine the level of workplace academic proficiency achieved by the potential employee. In addition, Illinois uses the reading for information and applied mathematics WorkKeys tests as a mandatory measure of student performance (ACT, 2012b). "When used effectively, the WorkKeys system can assist companies with employee selection and aid students in the smooth transition from school to work" (Reimer, 1996). The WorkKeys assessment provides a score for each student. Math and reading range from <3 to 7 with a score of 7 being the highest. In addition, the ACT WorkKeys organization provides a Career Readiness Certificate that designates the level of proficiency a student demonstrates. A score of 4 is considered Silver, 5 is Gold, and 6 and above are considered Platinum in terms of career readiness.

For the purpose of this study, schools that exhibited a high likelihood for three-component model inclusion were targeted through the use of state FFA programming awards that is Gold or Silver Emblem FFA Chapters. This study examined career readiness in Illinois agriculture students compared to all students from Illinois.

Purpose/Objectives

Specifically, this study sought to determine if there is a difference in ACT WorkKeys assessment scores when 11th -grade agriculture students from Gold and Silver Emblem FFA chapters are compared with all other state 11th grade students. In addition, the study examined if there is a difference in ACT WorkKeys assessment scores when agriculture students from Gold and Silver Emblem FFA chapters are compared with all other students from the same schools.

Methodology and Procedures

This study is part of a larger body of work that examined college and career readiness (Mouser et al., 2017). This study focused on career readiness and utilized a causal- comparative design to identify the relationship between test scores and participating in the traditional three-part agricultural education program. "Some quantitative research designs have the purpose of explaining educational phenomena through the study of cause-and-effect relationships" (Gall, Gall, & Borg, 2007, p. 306). In these designs, the cause of the phenomena would be considered the independent variable. The effect of the phenomena would be the dependent variable. Specifically, "Causal-comparative research is a type of non-experimental investigation in which researchers seek to identify cause and effect relationships by forming groups of individuals whom the independent variable is present or absent or present at several levels—and then determining whether the groups differ on the dependent variable" (Gall, Gall, & Borg, 2007, p. 306).

This study examined whether the independent variable of being involved in an agriculture program following the three-component structure in high school is related to the dependent variable of results on the WorkKeys career readiness ACT assessments. This led to the following research questions:

1. Is there a difference in ACT WorkKeys test scores when Illinois 11th grade agriculture students from Gold and Silver Emblem FFA chapters (Gold and Silver Ag) are compared with all Illinois 11th grade students (All Students)?
2. Is there a difference in ACT WorkKeys test scores when Illinois 11th grade agriculture students from Gold and Silver Emblem FFA chapters (Gold and Silver Ag) are compared with all juniors from the same schools (Gold and Silver All)?

Population and Sample

This study examined three groups of students. The first group (All Students) used for comparison in this study consisted of all juniors who completed the ACT in 2013 in Illinois. The second (Gold and Silver Ag) was those junior students at the Gold or Silver Emblem FFA chapter schools who participated in agricultural education. The final group (Gold and Silver All) was all juniors tested in 2013 who attended schools that held Gold or Silver FFA chapters.

Creation of Gold and Silver Ag Student Group. The top agriculture programs in Illinois, indicated by Gold or Silver Emblem FFA Chapters, for the year of 2012-2013 were identified. These schools maintain top FFA programs as judged by the state FFA association each year and based on a comprehensive program of activities. Schools that are designated in the top categories of Gold and Silver Emblem chapters have a high likelihood of having students who have completed an SAE and maintained an FFA experience throughout high school (J. Craft, personal communication, March 4, 2013). These schools were chosen to ensure the presence of the three-component model of agricultural education in each school. As noted in the literature, the SAE experience is becoming increasingly rare; therefore, identifying schools with a high likelihood of this best practice component is a necessity (Cheek, Arrington, Carter, & Randell 1994; Dyer & Osborne, 1995; Dyer & Osborne, 1996; Rubenstein & Thoron, 2014 & 2015; Steele, 1997). The data were collected through a survey of agriculture instructors at each of the qualifying high schools, that is, schools that applied the three-component structure of agricultural education. Basic demographic factors were collected; however, no identifiable characteristics of students were attained, other than student identification system (SIS) numbers, to ensure complete student anonymity. All data for this study were taken from a testing year 2012-2013. All schools with Gold and Silver Emblem FFA chapters in Illinois (122) were then surveyed for SIS numbers for students who took Illinois state tests in

2012-2013 as high school juniors (which created the Gold and Silver Ag group).

The three groups were compared to determine if differences exist among the groups on ACT WorkKeys assessment results. These data were used to illustrate, whether or not involvement in agriculture programs is related to career readiness, using the ACT WorkKeys assessment results.

The examinations were reviewed by the Illinois State Board of Education (ISBE) and by a panel of teachers and education experts to establish validity for measuring proficiency toward Illinois State Learning Standards (ISBE, 2011). The use of ACT and WorkKeys examinations allows for quality comparisons to take place. The reliability and validity of the ACT and WorkKeys examinations in a national capacity provide an excellent set of measures for this study. The universal acceptance of ACT as a measure of college readiness and the use of the WorkKeys portion of the testing series by business and industry organizations for predicting workplace readiness establishes validity for the purpose of studying career readiness (ACT, 2012a, 2012b). Each high school receives data at the conclusion of the state-testing period that provides scores on the ACT and all subtest scores, including ACT WorkKeys math and reading.

Data Collection and Recording

With the assistance of the ISBE, and its Facilitating Coordination in Agricultural Education (FCAE) project, test score information and basic demographic information were compiled for this study. After initial test scores were received from ISBE, survey material was compiled for agriculture instructors and principals from participating schools. Initially, an electronic contact was made by the researcher and by FCAE staff indicating that the study was going to take place, and schools were encouraged to monitor mail and electronic communications as well as to participate in the study.

To collect the data needed to complete this study, a survey was sent via mail and electronically to every agriculture instructor and principal at each of the 122 schools that were designated 2012-2013 Gold and Silver Emblem FFA chapters. The agriculture instructor in each school was asked to work with school administration and counselors to record SIS numbers for each agricultural education student who met the criteria for the study. Names and identifying information of students were not recorded or shared to protect the anonymity of students related to this study. The SIS numbers were provided electronically from each voluntarily participating school to the researcher. Schools were allotted five weeks to compile and return the information needed for the study. After two weeks, a reminder e-mail was sent to each school that had not returned the initial survey. A second reminder was sent electronically to schools that had not completed the data set after three weeks. Upon final collection of data from Gold and Silver Emblem FFA schools, the SIS numbers were shared securely through password protected spreadsheets with ISBE.

SIS numbers for all agricultural education students from Gold and Silver Emblem FFA chapter schools that took the state-mandated ACT examination series as juniors during the 2012-2013 school year were provided to the state board of education. The ISBE compiled the test scores per a Freedom of Information Act (FOIA) request and returned the data without the SIS numbers included, ensuring complete student anonymity. The researcher at no time could determine any identifiable information with any test score or SIS number. After receiving the test scores, statistical analysis was conducted for each area of testing associated with the study.

Data Analysis

A chi-square (X^2) goodness-of-fit test was used to compare the percentage results at each

score category between the groups. The tests were utilized to determine if a statistically significant difference in test score distributions exists between the associated groups in each analysis. A *p*-value of .05 was used as a cutoff for statistical significance (Urdan, 2010). The data were analyzed using SPSS. Demographic data collected on the sample of agriculture students were calculated.

Results/Findings

Three distinct groups were part of the analysis in this study: All tested juniors in Illinois (All Students), Junior agriculture students from Gold and Silver Emblem FFA chapters (Gold and Silver Ag), and all Junior students from schools that housed Gold and Silver Emblem FFA chapters (Gold and Silver All).

Demographic Data

Agriculture students had the lowest percentage of low-income students (15.4%), particularly in comparison to the overall state average of 49.9%. Table 1 lists demographic data on race, Limited English Proficiency (LEP), Individualized Education Plan (IEP), and the number of low-income students for All students, Gold and Silver Ag, and Gold and Silver All.

Table 1

Demographic Data

	N	% Male	% White	% LEP	% IEP	% Low Income
All Illinois Students	2,054,155	51.1	50.6	9.5	13.6	49.9
Gold and Silver All	4,611	51.1	90.3	0.3	11.2	28.7
Gold and Silver Ag	527	60.3	98.7	0	9.5	15.4

Note. LEP = Limited English Proficiency; IEP = Students with an Individualized Education Plan.

Results presented below compared agriculture students from the Gold and Silver FFA chapter schools first with all state juniors, and then with all juniors from the FFA chapter schools on the WorkKeys exams.

Gold and Silver Ag vs. All students. Table 2 provides the number and percentage of students at each score level on WorkKeys Reading and Math Assessments for both the Gold and Silver Ag and All student groups. A level 5 score indicates a career- ready designation in the reading content area examination.

Table 2

Gold and Silver Ag vs. All Students: WorkKeys Reading and Math Scores

	Reading		Math	
Score Level	Gold and Silver Ag	All Students State	Gold and Silver Ag	All Students State
	n / %	%	n / %	%
<3	12 / 2.3	4.44	7 / 1.3	6

3	17 / 3.2	4.69	39 / 7.4	15.25
4	132 / 25.0	30.77	87 / 16.5	19.39
5	199 / 37.8	32.59	179 / 34.0	28.87
6	124 / 23.5	21.15	154 / 29.2	21.53
7	43 / 8.2	6.37	61 / 11.6	8.96

In Table 3, the observed n column is the actual frequency of (Gold and Silver Ag) students that earned a score at the score level listed. The expected n column provides an expected number in the sample based on the percent of students scoring the same score level from the All Students data. The residual provides the difference in the observed and expected n at each score level. A chi-square analysis was performed to determine if there was a statistically significant difference between distributions of student test score levels at various ranges in reading and math respectively. The analysis produced a significant X^2 value for reading (X^2 (5) = 21.96, p = .001, w = .20). This indicates that there is a statistically significant difference in WorkKeys reading test scores between the Gold and Silver Ag students and All Students. Examination of score distributions shows that a larger number of Gold and Silver Ag students scored in the higher level of the score range than All Students who took the ACT WorkKeys reading assessment. However, Cohen's w suggests the difference to be small.

As shown in Table 3, the chi-square analysis produced a significant X^2 value for math as well (X^2 (5) = 65.96, p < .001, w = .35). This indicates that there is a statistically significant difference in WorkKeys math test scores between Gold and Silver Ag students and All Students. Cohen's w shows the size of the differences to be moderate. The score distributions indicate that more Gold and Silver Ag students scored in the higher level of the score range than All Students.

Table 3

Comparing Score Distributions on WorkKeys Reading and Math Assessments between Gold and Silver Agriculture and All Students

Subject Area	Score Level	Observed n	Expected n	Residual	$X^2_{(5)}$	p	w
Reading	<3	12	23.4	-11.4	21.96	.001	0.2
	3	17	24.7	-7.7			
	4	132	162.1	-30.1			
	5	199	171.7	27.3			
	6	124	111.4	12.6			
	7	43	33.6	9.4			
Math	<3	7	31.6	-24.6	65.96	< .001	0.35
	3	39	80.4	-41.4			
	4	87	102.2	-15.2			
	5	179	152.1	26.9			
	6	154	113.5	40.5			
	7	61	47.2	13.8			

Gold and Silver Ag vs. Gold and Silver All. Table 4 provides frequency and percentage of Gold and Silver Ag students and Gold and Silver All Students on the ACT WorkKeys Reading

and math assessment.

Table 4

Gold and Silver Ag vs. Gold and Silver All Students: WorkKeys Reading and Math

Score Level	Reading		Math	
	Gold/Silver Ag	Gold/Silver All	Gold/Silver Ag	Gold/Silver All
	n / %	%	n / %	%
<3	12 / 2.3	3.2	7 / 1.3	3.6
3	17 / 3.2	3.8	39 / 7.4	11
4	132 / 25.0	27.3	87 / 16.5	18.5
5	199 / 37.8	35.8	179 / 34.0	33
6	124 / 23.5	23.5	154 / 29.2	25.6
7	43 / 8.2	6.4	61 / 11.6	8.3

Table 5 showed that chi-square analysis produced a non-significant X^2 value for WorkKeys reading assessment (X^2 (5) = 5.96, p =.311). The test concludes that Gold and Silver Ag students scored similarly on the career readiness on the ACT WorkKeys reading assessment with Gold and Silver All students.

For WorkKeys math assessment, chi-square analysis showed a significant X^2 value (X^2 (5) = 24.55, p < .001, w = *.22*). This indicates that there is a statistically significant difference in WorkKeys math test scores between Gold and Silver Ag and Gold and Silver All. The test indicates that more Gold and Silver Ag students scored in the higher level of the score range than their non-agriculture education peers from the same schools. Cohen's w suggests the difference to be small.

Table 5

Comparing Score Distributions on Reading and Math Assessments for Gold and Silver Ag vs. Gold and Silver All

Subject Area	Score Level	Observed n	Expected n	Residual	$\chi_{(5)}$	p	w
Reading	<3	12	16.9	-4.9	5.96	.311	NP
	3	17	20	-3			
	4	132	143.9	-11.9			
	5	199	188.7	10.3			
	6	124	123.8	0.2			
	7	43	33.7	9.3			
Math	<3	7	19	-12	24.55	< .001	0.22
	3	39	58	-19			

4	87	97.5	-10.5
5	179	173.9	5.1
6	154	134.9	19.1
7	61	43.7	17.3

Note: NP = Not Applicable

Subgroup Analysis

Subgroup analysis was carried out because the comparison groups differ in student demographics. Characteristics of Gold and Silver Ag students differ from those of the All Students data; however, ISBE provided the assessment information as averages without the ability to delineate between various groups involving gender or socioeconomic status. This did not allow additional comparisons to be made between the Gold and Silver Ag and All Student subgroups.

Demographics of the Gold and Silver Ag students were more similar to Gold and Silver All than to All Students. Since the data associated with Gold and Silver Ag and Gold and Silver All students could be analyzed into subgroups, comparisons were made on gender and low-income between Gold and Silver Ag and Gold and Silver All to gain further insight into the differences, if any. Other factors or subgroups were not analyzed due to Gold and Silver Ag sample size not being ample enough to detect significance.

Males vs. females. Tables 6 to 7 outline the subgroup comparisons of males vs. females, and low-income vs. non-low-income between the Gold and Silver Ag students and their respective peers from the same schools. The frequency column was the actual number of Gold and Silver Ag students that earned a score at the score level listed. The expected *n* column provides an expected number in the Gold and Silver Ag student group based on the percent of males or females scoring the same score level from the Gold and Silver All data. Score levels may not reflect the full reported range (< 3 to 7) because some score levels were combined to attain adequate sample size for the chi-square test. Similar to the previous analysis, a chi-square goodness-of-fit test was performed to determine if there was a statistically significant difference between distributions of student test score level at various ranges in reading and math in each subpopulation.

Table 6

Chi-Square Tests for Gender Comparisons on ACT WorkKeys Reading Assessments

	Score Level	Frequency	Gold/Silver Ag %	All Same School %	Expected *n*	X^2	*p*
Females	<5	49	23.4	30.2	63.12	6.43	.09
n = 209	5	82	39.2	38.9	81.30		
	6	58	27.8	23.9	49.95		
	7	20	9.6	7.0	14.63		
Males	<3	12	3.8	5.0	15.90	5.10	.40
n = 318	3	13	4.1	5.1	16.22		
	4	87	27.4	28.2	89.68		
	5	117	36.8	32.8	104.30		
	6	66	20.8	23.1	73.46		
	7	23	7.2	5.8	18.44		

A chi-square analysis for females produced a non-significant X^2 value (X^2 = 6.43, p = .09) on WorkKeys reading (see Table 6). However, the ACT WorkKeys math comparison produced a significant X^2 value (X^2 = 13.72, p = .01, w = .26, see Table 7). Score distributions indicate that female Gold and Silver Ag students performed better at math on the WorkKeys assessment than their female peers from the same schools. Cohen's w suggests a small to moderate effect size.

A chi-square analysis for males gave a non-significant X^2 value (X^2 = 5.10, p = .40) on WorkKeys reading (see Table 6). However, the ACT WorkKeys math comparison produced a significant X^2 value (X^2 = 9.44, p = .05, w = .17, see Table 7). The data indicate that male Gold and Silver Ag students performed better in math on the WorkKeys assessment than their male peers from the same schools. Cohen's w suggests a small effect size.

Table 7
Chi-Square Tests for Gender Comparisons on ACT WorkKeys Math Assessments

	Score Level	Frequency	Gold and Silver AG %	Gold and Silver All %	Expected n	X^2	p	w
Females	<4	18	9%	14.9	31.14	13.72	.01	0.26
n = 209	4	40	19%	21.4	44.73			
	5	68	33%	33.6	70.22			
	6	62	30%	23.6	49.32			
	7	21	10%	6.4	13.38			
Males	<4	28	9%	14.2	45.16	9.44	0.05	0.17
n = 318	4	47	15%	15.7	49.93			
	5	111	35%	32.4	103.03			
	6	92	29%	27.6	87.77			
	7	40	13%	10.1	32.12			

Low-income vs. non-low income. A chi-square analysis was performed separately on both low-income and non-low-income students on WorkKeys reading (see Table 8) and math (see Table 9). The analysis for low-income students produced a non-significant X^2 value in reading (X^2 = 6.97, p = .22). Additionally, the analysis for low-income students in math produced a non-significant X^2 value (X^2 = 6.91, p = .14).

Table 8

Chi-Square Test for Low-income Comparisons on ACT WorkKeys Reading Assessments

	Score Level	Frequency	Gold/Silver Ag %	Gold/Silver All %	Expected n	X^2	P
Low-income	<3	2	2.5	5.5	4.46	6.97	.22
n = 81	3	7	8.6	6.7	5.43		
	4	21	25.9	34.7	28.11		
	5	28	34.6	33.6	27.22		
	6	19	23.5	16.4	13.28		

	7	4	4.9	3.1	2.51		
Non-low-income n = 446	<4	20	4.4	5.0	22.30	2.55	.64
	4	111	24.9	24.3	108.38		
	5	171	38.3	36.7	163.68		
	6	105	23.5	26.3	117.30		
	7	39	8.7	7.7	34.34		

Table 9

Chi-Square Test for Low- Income Comparisons on ACT WorkKeys Math Assessments

	Score Level	Frequency	Gold Silver Ag %	Gold Silver All %	Expected n	X^2	*p*
Low-income n = 81	<3	1	1.2	6.9	5.59	6.91	.14
	3	13	16.0	18.2	14.74		
	4	20	24.6	24.5	19.85		
	5	25	30.8	31.4	25.43		
	6,7	22	27.1	18.9	15.31		
Non-low-income n = 446	<4	32	7.1	10.3	45.94	6.40	.17
	4	67	15.0	16.1	71.81		
	5	154	34.5	33.6	149.86		
	6	139	31.1	29.7	132.46		
	7	54	12.1	10.3	45.94		

Summary

Based on the results of the study, we postulate two conclusions while noting that the differences in demographics may account for some of the variances in assessment results.

Conclusion One: Agriculture students are more career ready than their peers in area of math. The analysis indicated a rejection of the null and a conclusion that there was a statistically significant difference in WorkKeys test scores between Gold and Silver Ag and all Illinois junior students tested in the areas of math. The *w* suggested a moderate effect size in the area of math career readiness. When gold and silver agriculture students were compared to students from the same schools, additional statistically significant differences were found in the math career readiness ACT WorkKeys assessment. This outcome, though categorized by a small effect size, indicates that agriculture students in Gold and Silver emblem FFA chapters are more advanced in career readiness in relation to math applications than their peers. Finally, additional analysis of subgroups at the Gold and Silver emblem FFA chapter schools indicated that female agriculture students outperformed female students from the same schools by a statistically significant level. Moderate effect size was noted which indicated a more significant variance for females.

Conclusion Two: Agriculture students are as career ready as their peers in the area of reading. The analysis indicated a rejection of the null and a conclusion that there was a statistically significant difference in WorkKeys reading test scores between Gold and Silver Ag and All Students. Cohen's *w* suggests that the effect size is small. When Gold and Silver Ag students were compared to Gold and Silver All students on performance related to the ACT WorkKeys reading scores, no statistically significant differences were noted. The results indicate that gold and silver agriculture students are as career ready in the area of reading as their peers.

Significance of this study

This study provides a powerful perspective on the idea of career readiness as it relates to agricultural education programs. Agricultural education has suggested its ability to promote career success through the three-component model of agricultural education for years. This study provides quantifiable data to support the claim that agricultural education delivers career readiness as measured by a universally accepted model of assessment, the ACT WorkKeys examination series. In addition, the scale of the project utilized data from hundreds of students from multiple schools throughout Illinois to compile the results. This large scale is extremely unique in quantifying program effectiveness in agriculture education studies. Finally, the data was collected by the ISBE as part of a statewide assessment system under strict guidelines for collection and reporting, which further adds to the validity of the data associated.

The findings in this study provide a clear indication that agriculture students are meeting or exceeding the standards in the area of career readiness as measured by the ACT WorkKeys assessment series. This information, coupled with the findings of a previous study which proved core academic validity or college readiness levels of agriculture programs (Mouser et al., 2017) bring forth a compelling argument to include agricultural education in academic programming in American schools. If the goal of public education is to provide a college and career ready workforce, then agricultural education should be an essential component of the experience based on these findings.

Investment from business and industry

This study provides a compelling rationale for investment from business and industry to support local agricultural education programming. Agriculture teachers and leaders within the profession should utilize this study to provide data to business and industry to invest in a career-ready workforce by partnering with agriculture education and the three-component model of delivery. As evidenced by this study, students that have experienced quality agricultural education programming provide excellent career readiness levels in mathematics and reading. The unique nature of the agricultural education experience and delivery model produces career ready students that can be uniquely quantified as per these results.

Local support from school administration and boards of education

In a time when schools continually must find ways to do more with less, agricultural education provides quantifiable results in the areas of college and career readiness (Mouser, et al., 2017). The impact of this study to provide clear indicators of success to administrators and school board members is significant. This study delivers quantifiable data that should be used to create a data-driven narrative for the support of model agriculture programs throughout the country. If the goal of local school administrators is to support programming that ensures career-ready students, they should be looking to invest in quality agricultural programs as per the results of this study. If local school boards are interested in supporting school programs that promote career readiness to

strengthen local capacity and economies through a quality workforce, they should promote the inclusion of agricultural education programs in the school districts they serve. This study provides quantifiable data to support the direct successes of agricultural education to graduate career ready students.

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