

A Quantitative Analysis of the Perceptions of CTE Administrators on the Integration of Employability Skills into Agricultural Education

Abstract

Preparing students for the workforce is a foundational pillar of agricultural education. Unfortunately, many employers claim that students exiting secondary education are not prepared for an entry-level position. This study sought to assess the perceptions of Career and Technical Education (CTE) administrators in Alabama and Georgia on the importance of agricultural educators integrating employability skills into their instruction. Traditionally, the relationship between CTE administrators and agricultural educators has been viewed as important. An understanding of the perceptions of Alabama and Georgia CTE administrators who offer agricultural education in their district could be beneficial in determining the importance of employability skills integration into agricultural education. CTE administrators were asked to rate each individual employability skill on a Likert scale ranging from 1 = Not Important at All to 5 = Extremely Important. Construct scores for each employability skill category were calculated using the individual employability skills ratings. The results found that participating CTE administrators perceived all employability skill categories to be Very Important or Extremely Important. The employability skills most valued by CTE administrators included Critical Thinking Skills, Personal Qualities, and Communication Skills. A Multivariate Analysis of Variance (MANOVA) was used to ascertain any differences in perception held by CTE administrators in Alabama and Georgia. While the analysis did not return any statistically significant results, it could suggest that CTE administrators in Alabama and Georgia agree on which skills are most valuable for agricultural educators to integrate into their instruction.

Keywords: Agricultural Education; Employability Skills; CTE Administrator; Soft Skills

Introduction and Review of Literature

Providing students with the necessary skills to be successful in the workforce is a primary function of education (Symonds et al., 2011). Unfortunately, industry leaders have reported an employability skills gap among young adults (Casner-Lotto et al., 2006; Institute of Student Employers, 2018; Jaschick, 2015; McNamara, 2009; Robinson & Garton, 2008). Employability skills are often referred to by various names, such as soft skills, workplace skills, essential skills, etc. (Verma & Bedi, 2008). While the employability skills gap is not new, the issue has expanded to secondary and post-secondary students (Casner-Lotto et al., 2006; Copeland et al., 2020; Easterly et al., 2017; Haddad & Marx, 2018; Institute of Student Employers, 2018). In addition, employers report that many entry-level employees are deficient in applied academic subjects such as writing, mathematics, and reading comprehension, as well as leadership/interpersonal skills such as written communication, critical thinking, problem-solving, and professionalism (Casner-Lotto et al., 2006; Copeland et al., 2020; Easterly et al., 2017; Haddad & Marx, 2018; Institute of Student Employers, 2018). Although this skills gap affects many industries, the agricultural industry is not immune (Easterly et al., 2017; Hendrix & Morrison, 2018).

Overall, educators agree that integrating employability skills is vital to School-Based Agricultural Education's (SBAE) future (Free, 2017). While preparing students for careers is a principal focus of SBAE, teachers do not value all employability skills equally (Free, 2017). Ethics, communication, time management, and reliability were among the most valued employability skills

and agricultural educators report implementing strategies to instill these skills in students on a daily or weekly basis (Free, 2017). Consequently, these abilities align with the skills most desired by leaders in the agricultural industry (Copeland et al., 2020; Easterly et al., 2017; Haddad & Marx, 2018).

While education professionals and industry leaders agree that secondary and post-secondary student's employability skills need further development (Casner-Lotto et al., 2006; Institute of Student Employers, 2018; Jaschick, 2015; McNamara, 2009; Robinson & Garton, 2008), many students feel that they are prepared for the workforce (Copeland et al., 2020; DiBenedetto & Willis, 2020; Hendrix & Morrison, 2018; Norris et al., 2019). Furthermore, students at various educational attainment stages have self-reported high levels of communication skills (verbal and non-verbal), time management, and reliability (Copeland et al., 2020; DiBenedetto & Willis, 2020; Hendrix & Morrison, 2018; Norris et al., 2019). However, this high regard for their personal abilities could potentially suggest a disconnect between students' perceived levels of employability skills (Copeland et al., 2020; DiBenedetto & Willis, 2020; Hendrix & Morrison, 2018; Norris et al., 2019) and the perceptions of their abilities held by their employers (Casner-Lotto et al., 2006; Corder & Irlbeck, 2018; Easterly et al., 2017; Institute of Student Employers, 2018; Jaschick, 2015; McNamara, 2009; Robinson & Garton, 2008).

One of the skills most desired by industry includes the ability to apply academic subjects in real-world scenarios (Casner-Lotto et al., 2006; Corder & Irlbeck, 2018; Easterly et al., 2017; Jaschick, 2015; McNamara, 2009; Robinson & Garton, 2008). These applied academic skills are often utilized in the areas of Science, Technology, Engineering, and Mathematics (STEM; Chumbley et al., 2015; Kelly & Knowles, 2016; Smith et al., 2015; Stone, 2011; Stubbs & Myers, 2016; Swafford, 2018a; Swafford, 2018b; Wang & Knoblach, 2020). Integrating STEM and other academic subjects into agricultural education has been increasing in priority over the past decade (Chumbley et al., 2015; Smith et al., 2015; Stone, 2011; Wang & Knoblach, 2020). This real-life application of academic subjects can increase the knowledge and abilities of secondary students (Chiasson & Burnett, 2001; Cletzer et al., 2023; Nolin & Parr, 2013; Theriot & Kotrlik, 2009). In fact, some studies show that agricultural education students perform higher in math and science than their peers (Chiasson & Burnett, 2001; Nolin & Parr, 2013; Theriot & Kotrlik, 2009).

To resolve the skills gap, industry leaders and education stakeholders have tasked Career and Technical Education (CTE) and SBAE with ensuring that secondary graduates are prepared for the workforce (PCRN, 2022). The concept that agricultural education should provide industry with a prepared workforce is at the core of its development (Fristoe, 2017; Martinez, 2007). In addition, developing employability skills is critical for successful employment (Coffelt et al., 2016; Lear et al., 2015; Smith & Myers, 2012). In relation, Bancino and Zevalkink (2007) noted, "[t]hese [employability] skills are a 'must have'. Employers and business leaders are demanding that technical professionals not only master their technical disciplines but participate as full partners in the mission of the organization" (p. 22). With the introduction of the Common Core State Standard Initiative in 2010, education officials have strived to prepare students to become 'College and Career Ready' (Saeger, 2017). Agricultural education's critical role in promoting college and career readiness in students will challenge educators, teacher educators, and CTE administrators.

The primary strategies that agricultural educators use to incorporate employability skills education into their programs is promoting involvement in the National FFA Organization and Work Based Learning (WBL) opportunities through Supervised Agricultural Experiences (SAEs; Haddad & Marx, 2018; Lundry et al., 2015; Ramsey & Edwards, 2012; Smith & Rayfield, 2016). For decades, the FFA has served as the leadership development component of agricultural education (Lundry et al., 2015). Many studies show that involvement in FFA activities such as

Career Development Events (CDEs), Leadership Development Events (LDEs), and leadership conferences are highly effective in improving the employability skills of secondary students (Ahrens et al., 2015; Ricketts, 2003; Rosch et al., 2015). According to Copeland et al. (2020), a national survey of senior FFA members reported that they feel prepared for the workforce and are ‘College and Career Ready’. Furthermore, some studies have shown that FFA members possessed higher levels of various employability skills than their non-FFA peers (Chiasson & Burnett, 2001; Nolin & Parr, 2013; Theriot & Kotrlik, 2009), recorded higher rates of high school graduation (McKim et al., 2018), and tend to make more money throughout their careers than non-FFA members (McKim et al., 2018). Additionally, SAEs have proven to be highly effective in developing employability skills in secondary students (Haddad & Marx, 2018; Ramsey & Edwards, 2012; Smith & Rayfield, 2016). These strategies utilized by agricultural educators have shown positive effects in developing skills such as career decision-making, communication, problem-solving, and professionalism (Haddad & Marx, 2018).

SBAE’s role in developing employability skills in secondary students has given it a strong presence in American public education (Copeland et al., 2020). This prominence can be seen in its growth over its 120+ year history and the popularity of its courses (Friedel, 2011; Martinez, 2007). However, while agricultural education has prioritized employability skills integration (Rose et al., 2016), the skills gap reported by industry leaders may suggest that agricultural education stakeholders need to explore increasingly effective methods of employability skills integration. Overall, this skills gap is troubling to agricultural education professionals because the successful integration of employability skills development is critical for agricultural education’s relevance in the 21st century (Copeland et al., 2020).

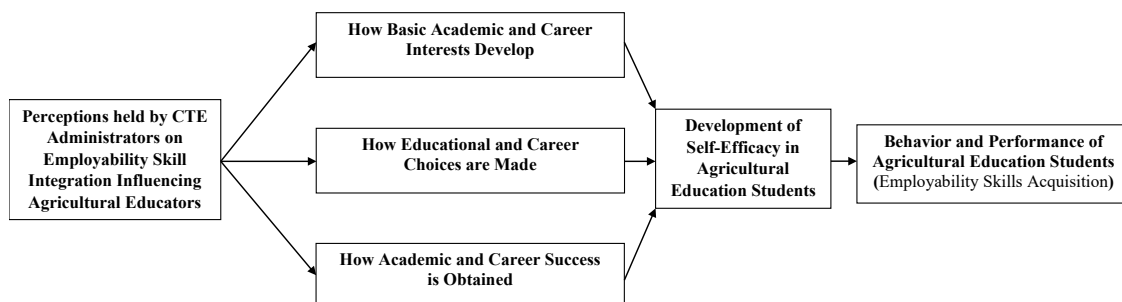
Traditionally, the relationship between the agricultural educator and the CTE administrator has been considered important. The CTE administrator often impacts state and federal funding allocations, specific duties of the agricultural educator, and curriculum development/course selection (Zirkle & Jeffery, 2017). This impact on an agricultural educator’s duties could influence their ability to integrate employability skills into their instruction. A knowledge of CTE administrators’ perceptions of employability skills integration into SBAE could help guide agricultural education in a positive direction that better allows educators to prepare students for the workforce.

Theoretical and Conceptual Framework

In 1994, Lent et al. developed the Social Cognitive Career Theory (SCCT; Figure 1), which aimed to portray (1) “how basic academic and career interests develop”, (2) “how educational and career choices are made”, and (3) “how academic and career success is obtained” (p. 751).

Figure 1

Model Developed from the Social Cognitive Career Theory



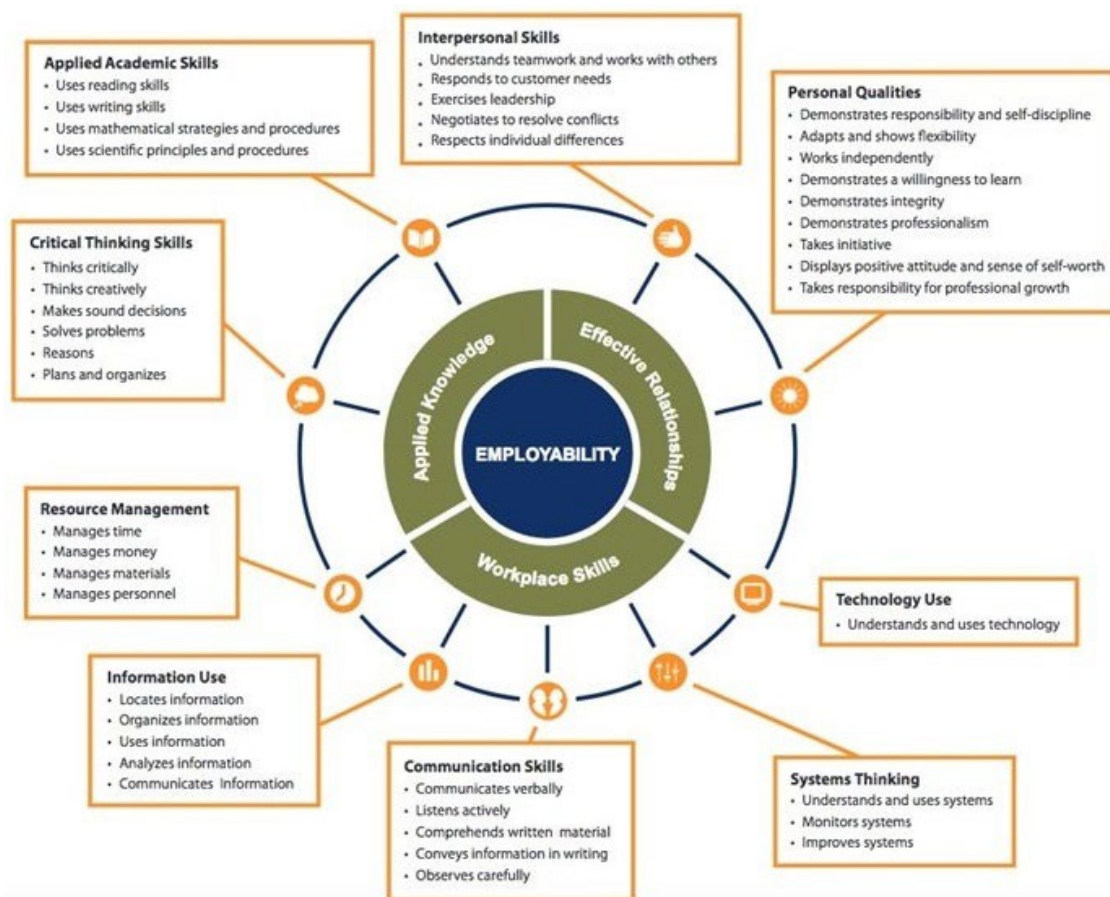
Note. Adapted from Lent et al. (1994)

This theory depicts that career and academic interests and career success are a function of three main areas: self-efficacy, outcome expectations, and goals. The formation of these three areas are closely related to the employability skills evaluated in this study. Ascertaining the perceptions of CTE administrators on which employability skills are most valuable will help educators guide students in developing academic and career interests, aiding them in determining their educational and career goals and choices, and assist them in obtaining academic and career success once their interests have been formed.

To accomplish this goal, the Employability Skills Framework developed by the Perkin’s Collaborative Resource Network (Figure 2; PCRN, 2022) was used to develop the questions in the instrument. The various iterations of the Carl D. Perkins Act sought to expand and improve CTE and workforce development in the U.S. and are coincidentally the primary source of federal funding for CTE and SBAE (Friedel, 2011). This framework portrays the employability skills that agricultural education programs should develop in their students (Figure 2).

Figure 2

Perkin’s Collaborative Resource Network Employability Skills Framework



Note. Utilized from PCRN, 2022

Purpose of the Study

This study aimed to ascertain the importance of employability skills integration into agricultural education based on the perceptions of CTE administrators in Alabama and Georgia that offer agricultural education in their districts. Furthermore, this study assessed any differences in the perceptions between Alabama and Georgia CTE administrators. This assessment has the potential to provide insight into which specific employability skills are valued the most by CTE administrators that offer agricultural education in their district. The following research objectives were executed:

1. Describe the extent that CTE Administrators in Alabama and Georgia that offer agricultural education in their district regard the importance of integrating specific employability skills into SBAE.
2. Assess any statistical differences in perceptions held by CTE administrators in Alabama versus CTE administrators in Georgia on the importance of employability skills integration into agricultural education.

Methods

Population

The population of this study was CTE administrators in Alabama ($N = 137$) and Georgia ($N = 178$) that offered agricultural education in their district. Utilizing a descriptive correlational research design, a census was employed to assess the perceptions of the population.

Instrumentation

The instrument utilized in the study was delivered through Qualtrics and evaluated the perceptions of Alabama and Georgia CTE administrators on integrating employability skills into agricultural education and collected demographic data on the participants. The instrument was developed based on the Employability Skills Framework produced by the Perkins Collaborative Resource Network (Figure 2; PCRN, 2022). Furthermore, each question that assessed employability skills utilized a Likert-type scale that ranged from 1 = *Not Important at All*, 2 = *Somewhat Important*, 3 = *Moderately Important*, 4 = *Very Important*, and 5 = *Extremely Important*. Each question utilized a matrix structure and began, "On a 1-5 scale, how important is it for secondary agricultural teachers to integrate the following [Insert Employability Skill Area] into their course curriculum?" The measured employability skills included applied academic skills, critical thinking skills, resource management skills, information use skills, communication skills, system thinking skills, technology use skills, interpersonal skills, and personal qualities. The instrument also collected demographic data on each CTE administrator, including gender, race, highest degree earned, CTE background, if agricultural education was offered in their district, years as a classroom teacher, total years in education, school system type, duty allocation, and school system size. If participants answered that agricultural education was not offered in their district, skip logic was applied to reroute them directly to the demographic data and skipped all questions regarding employability skills integration.

A committee of four Mississippi State University faculty was formed to evaluate the content, construct, and face validity of the instrument. Instrument reliability can be a concern in survey research (Salkind, 2017). To address this concern, Cronbach's alpha reliability tests were utilized to assess the employability skill areas. According to Ary et al. (2010), a coefficient greater than .8 is considered an acceptable level of reliability. The validity and reliability analyses detected no issues with the instrument. The results of the reliability test are presented in Table 1.

Table 1*Likert Scale Reliability Test Results for Employability Skills*

Employability Skill Area	α	f
Applied Academic Skills	.898	4
Critical Thinking Skills	.943	6
Resource Management Skills	.882	4
Information Use Skills	.926	5
Communication Skills	.916	5
System Thinking Skills	.950	3
Technology Skills	N/A	1
Personal Qualities	.931	9
Interpersonal Skills	.845	5

Pilot Test

The researchers conducted a pilot study with selected CTE administrators throughout Mississippi ($n = 33$). The pilot study yielded a 73% response rate ($f = 24$). Participants were asked to submit comments regarding the instrument's validity, readability, the statements' intent, text font, and other general formatting issues. Once the comments were collected, adjustments were made to the instrument as needed.

Data Collection

In this study, all CTE administrators were emailed individually using their employer email address with an introduction letter and a hyperlink to the instrument. There were 137 Alabama and 178 Georgia CTE administrator email recipients, which totals to ($N = 315$) total recipients. A list of CTE administrators was collected using directories from the Alabama State Department of Education, Georgia State Department of Education, school system websites, the Association for Career and Technical Administrators (ACTA) mailing list, and if necessary, a phone call to the district to inquire who manages CTE for that respective district. A spreadsheet of current CTE administrators from Alabama and Georgia was compiled, including the name of the administrator, the school system in which they are employed, and their email addresses. A census was used to collect data which alleviated any potential sampling bias. A threshold of 100% was set for the completion of the instrument, and no partial responses were included in the analysis. According to Ramsey and Schafer (2012), at least 30 responses are necessary for quality descriptive research. This study achieved a response rate of 38.7% ($n = 53$) in Alabama, a 42.7% ($n = 76$) response rate in Georgia, and a 41.0% ($n = 129$) response rate overall. If participants answered that agricultural education was not offered in their district, skip logic was applied to reroute them directly to the demographic data and skipped all questions regarding employability skills integration. This provided $n = 102$ responses that were used to assess research objectives one and two.

In this study, all CTE administrators were emailed individually with an introduction letter in the email and a hyperlink to the instrument. To assess for non-response bias, independent samples t -tests were used to assess any statistical differences between early responders and late responders (Linder et al., 2001). As recommended by Dillman et al. (2014), three reminder emails were sent to the CTE administrators after the initial contact. For this analysis, responses stimulated from the first two emails were considered early respondents ($n = 62$), and responses stimulated

from the last two emails were considered late responders ($n = 67$). The results from the t -tests suggest that there are no non-response bias concerns.

The data was analyzed using SPSS Version 27. To analyze research objective one, descriptive statistics and central tendencies were utilized, and research objective two was analyzed using a Multivariate Analysis of Variance (MANOVA)

Demographics of the Participants

Demographic information for participants is presented in Table 2.

Table 2

Personal Demographics of CTE Administrator Participants in Alabama and Georgia

		Alabama		Georgia		Total	
		<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Gender	Female	23	43.4	51	67.1	74	57.4
	Male	30	56.6	25	32.9	55	42.6
Race	White	44	83.0	63	82.9	107	82.9
	African American	8	15.1	13	17.1	21	16.3
	American/Alaskan Native	1	1.9	0	0.0	1	0.8
Highest Degree Earned	Bachelors	0	0.0	2	2.6	2	1.6
	Masters	15	28.3	10	13.2	25	19.4
	Specialist	21	39.6	42	55.3	63	48.8
	Doctoral	17	32.1	22	28.9	39	30.2
CTE Background	Agricultural Education	11	20.7	5	6.6	16	12.4
	Business Education	10	18.9	27	35.5	37	28.7
	Other Areas of CTE	1	1.9	10	5.3	11	8.6
	No Background in CTE	31	58.5	34	44.7	65	50.3
Years as a Teacher	0-5 Years	7	13.2	10	13.1	17	13.2
	6-10 Years	16	30.2	13	17.1	29	22.5
	11-15 Years	23	43.4	23	30.3	46	35.6
	16-25 Years	7	13.2	21	27.7	28	21.7
	25+ Years	0	0.0	9	11.8	9	7.0
School System Type	City School Systems	25	47.2	13	17.1	38	29.5
	County School System	28	52.8	63	82.9	91	70.5
Years in Education	0-5 Years	7	13.2	0	0.0	7	5.4
	6-10 Years	16	30.2	3	3.9	19	14.7
	11-15 Years	23	43.4	7	9.2	30	23.3
	16-20 Years	4	7.5	13	17.1	17	13.2
	21-25 Years	3	5.7	19	25.0	22	17.0
	25+ Years	0	0.0	34	44.8	34	26.4
Duty Allocation	Majority of Duties in CTE	36	67.9	56	73.7	92	71.3
	Majority Duties Not in CTE	17	32.1	20	26.3	37	28.7
School System Size	0-3,000 Students P-12	21	39.6	35	44.1	56	43.4
	3,000-9,000 Students P-12	24	45.3	24	31.6	48	37.2
	9,000-15,000 Students P-12	6	11.3	9	11.9	15	11.6
	15,000+ Students P-12	2	3.8	8	10.4	10	7.8
Agricultural Education	Offered	38	71.7	64	84.2	102	79.1
	Not Offered	15	28.3	12	15.8	27	20.9

Note. $n = 102$

Female CTE administrators comprised the largest gender group (57.4% or $f = 74$), while 42.6% of CTE administrators were male ($f = 55$). A total of 82.9% of CTE administrators were white ($f = 107$), 16.3% were African American ($f = 21$), and 0.8% were American Indian/Alaska Native ($f = 1$). Approximately 1.6% of CTE administrator's highest degree earned was a bachelor's degree ($f = 2$), 19.4% had a master's degree ($f = 25$), 48.8% had a specialist degree ($f = 63$), and 30.2% had earned a doctoral degree ($f = 39$). A total of 50.3% of CTE administrators ($f = 65$) had no CTE background. Of those that did report having a background in CTE, 28.7% had a background in business/marketing education ($f = 37$), 12.4% had a background in agricultural education ($f = 16$), and 8.6% had a background in other areas of CTE ($f = 11$). The years of experience as a classroom teacher differed significantly among CTE administrators, with a mean of 13.05 years ($SD = 7.07$). In addition, 13.2% reported having 0-5 years of classroom experience ($f = 17$), 22.5% reported having 6-10 years of experience ($f = 29$), 35.6% reported 11-15 years of experience ($f = 46$), 21.7% had 16-25 years of experience ($f = 28$), and 7.0% reported having 25+ years of experience as a classroom teacher ($f = 9$).

Total years of experience in education had a mean of 23.25 years ($SD = 6.69$). Of the participants that responded, 5.4% reported having 0-5 years of experience ($f = 7$), 14.7% reported having 6-10 years of experience ($f = 19$), 23.3% reported having 11-15 years of experience ($f = 30$), 13.2% reported having 16-20 years of experience ($f = 17$), 17.0% reported having 21-25 years of experience ($f = 22$), and 26.4% reported having 25+ years of total education experience ($f = 34$).

School districts that employed CTE administrators were diverse in size. Approximately 43.4% had 0-3000 students enrolled in P-12 ($f = 56$), 37.2% had 3,000-9,000 students enrolled in P-12 ($f = 48$), 11.6% had 9,000-15,000 students enrolled in P-12 ($f = 15$), and 7.8% has 15,000+ students enrolled in P-12 ($f = 10$).

Over 71.3% of CTE administrators reported that most of their duties were related to CTE ($f = 92$), while 28.7% reported that most of their duties did not relate to CTE ($f = 37$). The administrators claimed that 79.1% of their districts offer agricultural education ($f = 102$) and 20.9% do not offer agricultural education ($f = 27$).

Results

Research Objective One

The results suggest that CTE administrators ranked Critical Thinking Skills, Personal Qualities, Communication Skills, and Interpersonal Skills as the highest possible *Extremely Important* rating. Furthermore, CTE administrators ranked Applied Academic Skills, Information Use Skills, Technology Skills, Resource Management Skills, and Systems Thinking Skills as the second highest *Very Important* rating. Overall, the highest-rated individual skills included Problem Solving ($M = 4.79$, $SD = .41$), Critical Thinking ($M = 4.75$, $SD = .43$), Demonstrating Integrity ($M = 4.74$, $SD = .44$), and Reasoning ($M = 4.73$, $SD = .47$) with between 99% and 100% of CTE administrators agreeing that these skills are *Very Important* or *Extremely Important*. Conversely, the lowest-ranked individual skills were Improving Systems ($M = 4.14$, $SD = .73$), Monitoring Systems ($M = 4.15$, $SD = .72$), Managing Personnel ($M = 4.17$, $SD = .79$), and Understanding and Using Systems ($M = 4.24$, $SD = .72$). Overall, 79.4% to 85.3% of CTE administrators agreed these skills are *Very Important* or *Extremely Important*. The complete list of results from research objective one are listed in Table 3.

Table 3*Descriptive Statistics for Individual and Construct Scores for Employability Skill*

Employability Skill Areas	<i>M</i>	<i>SD</i>	<i>%</i>
Critical Thinking Skills	4.71	.47	98.9
Problem Solving	4.79	.41	100.0
Critical Thinking	4.75	.43	100.0
Reasoning	4.73	.47	99.0
Making Sound Decisions	4.71	.48	99.1
Planning and Organizing	4.70	.48	99.0
Creative Thinking	4.57	.59	95.1
Personal Qualities	4.62	.53	98.4
Demonstrating Integrity	4.74	.44	100.0
Responsibility and Self-Discipline	4.70	.48	99.0
Demonstrating Professionalism	4.69	.47	100.0
Demonstrating a Willingness to Learn	4.64	.56	98.1
Taking Initiative	4.62	.55	97.1
Positive Attitude and a Sense of Self-Worth	4.61	.58	97.1
Adapting and Showing Flexibility	4.57	.52	99.0
Working Independently	4.49	.56	97.1
Taking Responsibility for Professional Growth	4.48	.63	95.1
Communication Skills	4.57	.54	97.7
Listening Actively	4.64	.52	98.1
Communicating Verbally	4.61	.49	100.0
Observing Carefully	4.58	.54	98.0
Comprehending Written Material	4.54	.56	97.1
Conveying Information in Writing	4.48	.59	95.1
Interpersonal Skills	4.52	.60	94.1
Teamwork and Working with Others	4.71	.48	99.1
Respecting Individual Differences	4.53	.69	91.1
Responding to Customer Needs	4.48	.64	92.2
Negotiating Resolve Conflicts	4.45	.62	93.2
Exercising Leadership	4.42	.59	95.1
Applied Academic Skills	4.48	.62	93.6
Scientific Principles and Procedures	4.52	.56	97.1
Reading Skills	4.51	.64	92.1
Mathematical Strategies and Procedures	4.49	.61	94.1
Writing Skills	4.41	.65	91.2
Information Use Skills	4.48	.61	94.5
Communicating Information	4.61	.51	99.1
Using Information	4.52	.56	97.1
Analyzing Information	4.47	.64	94.1
Locating Information	4.42	.65	91.2
Organizing Information	4.37	.67	91.2

Employability Skill Areas	<i>M</i>	<i>SD</i>	%
Technology Skills	4.44	.57	96.1
Understanding and Using Technology	4.44	.57	96.1
Resource Management Skills	4.40	.67	94.5
Managing Time	4.55	.56	97.0
Managing Materials	4.52	.64	92.2
Managing Money	4.38	.70	87.3
Managing Personnel	4.17	.79	82.4
Systems Thinking Skills	4.17	.71	81.7
Understanding and Using Systems	4.24	.69	85.3
Monitoring Systems	4.15	.72	80.4
Improving Systems	4.14	.73	79.4

Note. $n = 102$. 1 = Not Important at All; 2 = Somewhat Important; 3 = Moderately Important; 4 = Very Important; 5 = Extremely Important. The percentage of CTE administrators that ranked the skills as Very Important or Extremely Important are listed in the table.

Research Objective Two

Research objective two assessed any statistical differences between the perceptions of CTE administrators in Alabama and Georgia using a Multivariate Analysis of Variance (MANOVA). The means, standard deviations, and frequencies used in the MANOVA are listed in Table 4.

Table 4

Descriptive Statistics for CTE Administrators' Perceptions of Employability Skills by State of Employment

Employability Skills	Alabama ($f = 38$)		Georgia ($f = 64$)		Total ($f = 102$)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Applied Academic Skills	4.51	.50	4.47	.57	4.48	.54
Critical Thinking Skills	4.69	.43	4.72	.73	4.71	.42
Resource Management Skills	4.39	.59	4.41	.58	4.40	.58
Information Use Skills	4.56	.49	4.43	.56	4.48	.54
Communication Skills	4.57	.44	4.57	.49	4.57	.47
Systems Thinking Skills	4.12	.66	4.20	.70	4.17	.68
Technology Skills	4.34	.58	4.50	.56	4.44	.57
Personal Qualities	4.63	.42	4.60	.44	4.61	.43
Interpersonal Skills	4.55	.49	4.50	.47	4.52	.48

Note. 1 = Not Important at All; 2 = Somewhat Important; 3 = Moderately Important; 4 = Very Important; 5 = Extremely Important.

To screen for multivariate outliers among variables, Mahalanobis distance scores were generated. In the analysis, there were nine degrees of freedom, which equated to a critical Chi-square value of 27.88 ($\alpha = .001$). The test revealed one case with a distance score exceeding this critical value. However, the response was retained for the analysis due to the limited nature of the outlier.

According to O'Brien (2007), the threshold for tolerance levels when assessing multicollinearity is .10. A test linear regression was used to assess the condition of multicollinearity, and it was found that the condition was not violated (Applied Academic Skills,

Tolerance = .54; Critical Thinking Skills, Tolerance = .28; Resource Management Skills, Tolerance = .44; Information Use Skills, Tolerance = .29; Communication Skills, Tolerance = .28; Systems Thinking Skills, Tolerance = .44; Technology Skills, Tolerance = .68; Personal Qualities, Tolerance = .24; Interpersonal Skills, Tolerance = .20). To assess multivariate normality, the Shapiro-Wilk's test was used which indicated that all dependent variables violate the multivariate normality assumption. According to Olson (1974), the MANOVA is robust against deviations from normality, assuming limited multivariate outliers. In addition, the assumption of linearity was assessed using Q-Q plots and individual scatterplot matrices, and the examination suggests that the condition of linearity is met.

The assumption of homogeneity of covariance matrices was assessed using Box's test: Box's $M = 51.19$, $F(45, 92) = 1.02$, $p = .44$. The nonsignificant result of Box's test suggests that the assumption is met.

A MANOVA was utilized to evaluate the effect of the state of employment on how specific employability skills are valued, and it was found that there was not a significant effect: Wilk's $\lambda = .104$, $F(9, 92) = 1.18$, $p = .316$. The analysis measured a medium effect size using partial eta squared ($\eta_p^2 = .104$) (Cohen, 1988). The results from the MANOVA are presented in Table 5.

Table 5

MANOVA Results for Employability Skills by State of Employment

Wilk's λ	F	Hypothesis df	Error df	p	η_p^2
.896	1.181	9.000	92.000	.316	.104

Note. $\alpha = .05$

In addition, several univariate Analysis of Variance (ANOVA) tests were used to assess any statistical differences between the employability skill areas and the state of employment. The test indicated no statistical differences among any of the dependent variables.

Conclusions and Discussion

The first research question assessed the extent that CTE administrators regard the importance of integrating employability skills into SBAE. Overall, the CTE administrators valued the assessed employability skills as *Very Important* or *Extremely Important*. Furthermore, between 79.1% and 100.0% of CTE administrators agreed that these individual skills are *Very Important* or *Extremely Important* to SBAE.

The results from this study align with Free (2017), which found that Alabama agricultural educators ranked general ethics, reliability, and communication skills as the most valuable employability skills. These results are consistent with the findings of this study, with Personal Qualities and Communication Skills being two of the highest-regarded employable skills by CTE administrators. This shows consistency between agricultural educators and CTE administrators on how they value each skill. Continuity between CTE administrators and agricultural educators could help SBAE meet its goal of preparing students for the workforce.

In Robinson and Garton's (2008) study, post-secondary graduates from the College of Agriculture, Food, and Natural Resources at the University of Missouri reported that "solving problems", "functioning well in stressful situations", "ability to work independently", and

“maintaining a positive attitude” are the most important employability skills to possess in the workplace. This study found that Problem Solving ($M = 4.79$, $SD = .41$) was the highest ranked individual skill in the Critical Thinking area. Furthermore, 97.1% of CTE administrators agreed that a positive attitude, a sense of self-worth, and working independently are all *Very Important* or *Extremely Important*. This congruency between CTE administrators, industry professionals, and students is positive and provides educators with guidance on which employability skills to focus their integration efforts.

Incorporating academic subjects into SBAE through STEM has become a targeted focus of agricultural education (Casner-Lotto et al., 2006; Corder & Irlbeck, 2018; Easterly et al., 2017; Jaschick, 2015; McNamara, 2009; Robinson & Garton, 2008). This priority of STEM integration is crucial because industry leaders claim that applied academic skills are a desirable trait among entry-level employees (Casner-Lotto et al., 2006; Easterly et al., 2017). This real-world academic knowledge and skillset can be developed through quality STEM integration (Chumbley et al., 2015; Kelly & Knowles, 2016; Smith et al., 2015; Stone, 2011; Stubbs & Myers, 2016; Swafford, 2018a; Swafford, 2018b; Wang & Knoblach, 2020). Furthermore, agricultural educators agreed that STEM integration is critical to student achievement (Stubbs & Myers, 2016; Swafford, 2018a; Swafford, 2018b; Wang & Knoblach, 2020). This study found that 91.2% to 97.1% of CTE administrators agree that applied academic skills are *Very Important* or *Extremely Important*. Furthermore, applied academic skills such as applying scientific principles and procedures ($M = 4.52$, $SD = .56$), reading skills ($M = 4.51$, $SD = .64$), applying mathematical strategies and procedures ($M = 4.49$, $SD = .61$), and writing skills ($M = 4.41$, $SD = .65$) were all ranked as *Extremely Important* by CTE administrators. This is reassuring to agricultural educators because research shows that SBAE students perform higher in math and science than their peers (Chiasson & Burnett, 2001; Nolin & Parr, 2013; Theriot & Kotrlik, 2009).

The primary strategies agricultural education utilizes for developing employability skills in secondary students are the National FFA Organization (Lundry et al., 2015) and promoting involvement in SAE projects (Haddad & Marx, 2018; Ramsey & Edwards, 2012; Smith & Rayfield, 2016). The FFA has served as agricultural education’s leadership development organization for decades (Camp & Crunkilton, 1985). Several studies have suggested that the FFA organization is highly effective at instilling communication, leadership, critical thinking, problem-solving, and creative thinking skills in secondary education students (Ahrens et al., 2015; Ricketts, 2003; Rosch et al., 2015). Coincidentally, the results of this study found that CTE administrators ranked the skills that FFA promotes in its members, such as communication ($M = 4.57$, $SD = .54$), critical thinking ($M = 4.75$, $SD = .43$), problem-solving ($M = 4.79$, $SD = .41$), and creative thinking ($M = 4.57$, $SD = .59$) as *Extremely Important*. The FFA utilizes experiences through Career Development Events (CDEs), Leadership Development Events (LDEs), and leadership conferences to engage students in personal development (Ahrens et al., 2015; Chiasson & Burnett, 2001; Nolin & Parr, 2013; Ricketts, 2003; Rosch et al., 2015; Theriot & Kotrlik, 2009). Furthermore, students involved in the FFA organization tend to have higher graduation rates and earn a higher income throughout their careers (McKim et al., 2018). In addition, SAEs are known to be effective in developing employability skills in secondary students (Haddad & Marx, 2018; Ramsey & Edwards, 2012; Smith & Rayfield, 2016).

The second research question aimed to assess any statistical differences in perception among CTE administrators in Alabama and Georgia. To determine these results, a MANOVA was used to ascertain any differences in perceptions among Alabama and Georgia CTE administrators. The MANOVA yielded a nonsignificant result which could suggest that CTE administrators in Alabama and Georgia that offer agricultural education in their district have consistent views on the importance of employability skills integration into agricultural education.

In the Social Cognitive Career Theory developed by Lent et al. (1994), three items are portrayed, including (1) “how basic academic and career interests develop”, (2) “how educational and career choices are made”, and (3) “how academic and career success is obtained” (p. 751). These three items are closely aligned to the employability skills assessed in this study and the abilities desired by agricultural industry leaders. The congruency in the perceptions of employability skills integration held by CTE administrators and agricultural educators will be instrumental in ensuring students are guided in developing academic and career interests, aided in determining their educational and career goals and choices, and assisted in obtaining academic and career success once their interests have been formed.

Recommendations

Overall, the findings in this research showed that CTE administrators that offer agricultural education in their district positively perceive employability skills integration into agricultural education. In addition, CTE administrators collectively rated all employability skill areas as *Very Important* or *Extremely Important*. This positive outlook on integrating employability skills into agricultural education will allow educators to focus their efforts on closing the current skills gap. Based on these findings, agricultural educators should focus on the skills that CTE administrators value the most, such as critical thinking skills and instilling valuable personal qualities into students. To progress the profession, developing and implementing effective strategies of employability skills integration is critical. Some effective methods of developing these employability skills are with Work Based Learning projects such as SAEs (Haddad & Marx, 2018; Ramsey & Edwards, 2012; Smith & Rayfield, 2016), Simulated Workforce Classrooms, and leadership opportunities through Career and Technical Student Organizations (CTSOs) such as the National FFA Organization (Ahrens et al., 2015; Doss & Rayfield, 2022; Ricketts, 2003; Rosch et al., 2015). Currently, providing students with leadership opportunities within the National FFA Organization has proven to be one of the most effective employability skills development methods for secondary students (Ahrens et al., 2015; Chiasson & Burnett, 2001; Nolin & Parr, 2013; Ricketts, 2003; Rosch et al., 2015; Theriot & Kotrlik, 2009). It is recommended that agricultural educators continue to provide students with opportunities through FFA and SAE and that methods of expansion be explored to ensure these opportunities are accessible to all students.

Overall, it is recommended that future research inquiries evaluate the perceptions of CTE administrators in other areas of the U.S. and administrators in other areas besides CTE (superintendents, principals, etc.) on the importance of employability skills integration into agricultural education. In addition, examining the long-term effects of students participating in WBL programs such as SAE or leadership organizations such as the FFA and determining the professional development needs of agricultural teachers to implement these strategies could be beneficial in ensuring practical employability skills integration is achieved.

Furthermore, the demographics portion of the study found that 50.3% of CTE administrators in Alabama and Georgia do not have a background in CTE before becoming an administrator. Considering the importance of workforce development and career education to today’s industry, this is concerning. Therefore, when hiring CTE administrators in the future, school systems should consider candidates with CTE classroom experience and an educational background in CTE due to its value and relevance to administrating CTE teachers.

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