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Post-secondary Students' Perceptions of Career Readiness Skills

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Abstract

Awareness of one's knowledge, skills, and dispositions are important for college graduates to excel in the workforce. The purpose of this study was to administer a needs assessment to students enrolled in the Agricultural Sciences department at Clemson University to determine areas of discrepancy based on perceived levels of proficiency and importance of knowledge, skills, and dispositions for career readiness. The Borich needs assessment model was used to discern between student's perceived competency and importance of career readiness skills within nine constructs. Constructs were analyzed and ranked using mean and grand mean weighted discrepancy scores. We found career skills, interdisciplinary skills, life skills, and learning skills ranked as the highest areas of need. Some differences were revealed among the three majors in the department, but career skills were consistently ranked as students' highest priority need. The majority of the students believed they were most responsible for developing skills to prepare themselves to be career ready. Recommendations included expanded data collection among employers, faculty, secondary education teachers and students, and post-secondary students enrolled at technical colleges and conducting a pre/post survey of students as they enter their first semester and complete their final semester to determine any change in student perception over time.

***Keywords*:** career readiness; career ready; career skills; dispositions; knowledge; post-secondary; skills

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Introduction

Students who graduate from high school and enter college do so with the goal of finding a career after obtaining their education. While students are graduating college with the proper academic backgrounds, other career readiness skills may be lacking (Stone & Lewis, 2012). Students should learn in contextual environments that provide opportunities for transfer and application of the knowledge they gain (Carnevale, 2013). Accordingly, "In an era when agricultural education is concerned with informing people about agriculture, students must be literate in the subject matter, have the skills to effectively communicate, and be successful in finding employment after graduation" (Garton & Robinson, 2006, p. 31). Soft skill knowledge such as motivation, creative thinking, productivity, decision making, and initiative as well as academic and technical knowledge are important for college graduates to excel in the workforce. When faced with problems in the workforce, students must be able to respond by independently applying their academic knowledge and skills to the specific situation (Carnevale, Smith, & Melton, 2011; Schmidt et al., 2012).

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One question that has arisen for debate within the education system posed, "Is it possible that colleges and universities are failing in their role to prepare graduates for the expectations of the workforce?" (Robinson, Garton & Vaughn, 2007, p. 19). Similarly, Wardlow and Osborne (2010) proposed, "Public education in America should seek to develop independent-minded individuals who possess intellectual autonomy that allows them to conceptualize and effectively respond to problems encountered in daily living and in their professional pursuits" (p. 24). The debate of whose responsibility it is to prepare graduates with these skills is still a challenge presented within the education realm.

Every occupation may not require a four-year college degree, but by 2020 nearly 65% of all jobs will require the applicant to have some form of post-secondary education (Carnevale, Smith, & Strohl, 2013).

> As we look at how to help education strengthen democracy, there's nothing more important given these economic changes than equipping your people, and people of all ages, with the skills they need to get a good job and a good career in a fast-changing economy. If we don't succeed in adapting the education skills of young people to get a good job and good career, the very foundations of our democracy are at risk.
>
> Jon Schnur CEO of America Achieves, at the Global Learning Network 2017 Convening of World-Leading Learners in December of 2017 (p. 2).

Research Priority three of the American Association for Agricultural Educators (AAAE) National Research Agenda (NRA) calls for a Sufficient Scientific and Professional Workforce that Addresses the Challenges of the 21st Century. Research priority questions three and six pose the questions 'What competencies are needed for an agriculture and natural resource workforce? and What competencies are needed to effectively educate, communicate, and lead?" (Roberts, Harder, & Brashears, 2016). Our research sought to provide answers to address the AAAE NRA questions and embody the discussion that was initiated at the Global Learning Network 2017 Convening of World-Leading Learners in December of 2017.

In order to properly prepare students to be college and career ready in the 21st century, it is necessary to promote a collaborative environment among secondary schools, colleges and universities, as well as policy makers and business leaders (DiBenedetto & Myers, 2016). DiBenedetto and Myers (2016) developed nine constructs, which identify the knowledge, skills, and dispositions required of high school students to be career ready in the 21st century. The constructs developed by DiBenedetto and Myers (2016) served as a product of an extensive summary of literature, which identified 21st century career readiness skills. Table 1 provides a list of the knowledge, skills, and dispositions indicating the nine constructs and skill variables that were used in this research. The question of who is responsible for preparing students for career readiness is up for debate amongst the general public, secondary schools, and post-secondary schools and "there has been some question with regard to who has been responsible for preparing students with the college and career readiness skills needed to be successful in the 21st century workplace" (DiBenedetto & Myers, 2016 p. 28).

Table 1

21st Century Knowledge, Skills, and Dispositions (DiBenedetto & Myers, 2016)

Construct	Variable
Learning Skills	Contextual Learning, Critical Thinking, Initiative, Perseverance/Grit, Problem Solving, Reasoning, Self-Direction

Table 1

21st Century Knowledge, Skills, and Dispositions (DiBenedetto & Myers, 2016) Continued…

Life Skills	Accountability, Goal Management, Organizational Skills, Problem Solving, Social/Cross-Cultural Skills, Time Management
Career Skills	Career Decision Making, Job Search Skills, Productivity, Responsibility, Work Habits/Ethics
Social Skills	Understanding Diversity, Ethical Responsibility, Honesty, Integrity, Social Responsibility
Interdisciplinary Topics	Agriculture, Civics, Communications, Economics, Environment, Global Awareness, Health, Technology
Knowledge Competencies	Decision Making, Innovation, Proficiency, Personal Productivity, Teamwork
Incidental Learning Skills	Adaptability, Confidence, Decision Making, Flexibility, Leadership, People Skills, Productivity, Proficiency, Initiative/Self-Direction, Teamwork
Dispositions	Creativity/Creative Thinking, Engagement in Life-Long Learning, Flexibility, Innovation, Motivation, Perseverance/Grit, Personal Productivity, Responsibility, Self-Direction/Self Discipline, Self Esteem
Experiences	Career Related Work Experience/Internship, Community Engagement, Cross Disciplinary Connections, International Engagement, Leadership, Project Management, Teamwork

While research on employer and teacher perceptions of college and career readiness skills exists, a limited amount of literature has been published regarding the topic from the post-secondary students' perspective. Robinson, Garton, and Vaughn (2007) found problem solving, risk taking, and motivation to be the three highest ranked of 16 employability skill constructs among the post-secondary graduates in the College of Agriculture, Food and Natural Resources at the University of Missouri and recommended research was needed to "identify and determine the specific items and variables compromising the constructs" (p. 25). Our research sought to add to the literature by

analyzing post-secondary students' perceived importance and competency level of career readiness skills to more effectively address specific competencies of need particularly among three majors within an agricultural sciences department. The Agricultural Sciences department within the College of Agriculture, Forestry, and Life Sciences at Clemson University is comprised of three unique undergraduate programs which include agribusiness, agricultural education, and agricultural mechanization. Students enrolled in each of the three major's complete similar coursework within the department to prepare for comparable careers.

Theoretical/Conceptual Framework

Bandura's Social Cognitive Theory (Bandura, 1986) and Bronfenbrenner's Biological Theory of Human Development (Bronfenbrenner, 2005) served as the theoretical framework that guided this research. Social cognitive theory posits that learning occurs in a social context where a reciprocal interaction occurs among the person, environment and behavior allowing for past experiences to determine future behaviors (Bandura, 1986). Similarly, Bronfenbrenner's Biological Theory of Human Development identified four aspects of growth representing individual environmental interactions which include process, context, person and time (Bronfenbrenner, 2005). A combination of these two theories were conceptualized by DiBenedetto and Myers' (2016) Model of Student Readiness in the 21st Century (Figure 1), which includes home, community, school and world environments. Recommendations from DiBenedetto and Myers (2016) suggested further research using their model to determine perceptions of teachers, administrators, industry leaders, parents, and students, to improve the preparation of students for college and career readiness was needed. The nine career readiness constructs created from DiBenedetto and Myers' (2016) research were utilized by this study and added to the conceptual model in Figure 1 to determine the perceived level of importance and competency level of post-secondary student's career readiness. By having students self-report their perceived importance and competency levels of various knowledge, skills, and dispositions for career readiness, they provided personal perceptions of their self-efficacy towards their beliefs of the knowledge they possess (Bandura, 1986). As the education system reflects upon priority areas of need for 21st century skill development, leaders and administrators will be better equipped to identify career readiness skills within the curriculum and improve program effectiveness to help prepare students for the workforce. Determining where responsibility for career readiness lies can also help answer the important question of how to better prepare students for careers.

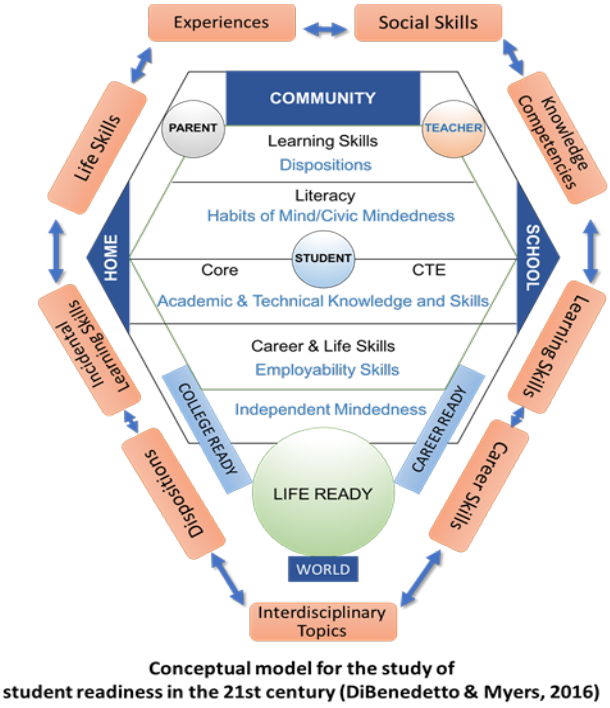

Figure 1. Adapted conceptual model for the study of student readiness in the 21st century (DiBenedetto & Myers, 2016)

Purpose and Objectives

The purpose of this research was to describe the perceptions of post-secondary students towards the career readiness skills they possess and to explore who is responsible for career preparedness. To achieve the purpose of this research we administered a needs assessment to determine areas of discrepancy based on perceived levels of proficiency and importance of knowledge, skills, and dispositions for career readiness to post-secondary students enrolled in courses in the Agricultural Sciences department at Clemson University. The following objectives guided our research:

1. Describe the demographic and academic profile of students enrolled in the Agricultural Sciences department courses;
2. Determine students' self-perceived competency and importance on the knowledge, skills, and dispositions defined by DiBenedetto and Myers (2016) required to be career ready using mean weighted discrepancy scores (MWDS);
3. Determine students' self-perceived competency and importance by career readiness construct using grand mean weighted discrepancy scores (GMWDS);
4. Determine students' perception of who is responsible for teaching knowledge, skills and dispositions within each career readiness construct, for the overall department and by individual major;
5. Determine specific priority needs for student development to improve career readiness and identify curricular modifications within the Agricultural Sciences department at Clemson University.

Methods and Procedures

A non-experimental, quantitative, descriptive survey design was used for this research. The study received approval by the Clemson University Institutional Review Board and was deemed exempt. The population for the study consisted of a census of post-secondary students enrolled in any course in the Agricultural Sciences department at Clemson University during the fall 2017 semester. The instrument used to collect data was originally developed to describe teachers' perceptions of knowledge, skills, and dispositions required of students to be career ready (DiBenedetto, 2015). Language was altered for the population of interest, post-secondary students. Cognitive interviews (N = 11) were completed prior to conducting a pilot test to determine face and content validity of the instrument. Cognitive interviews can be beneficial to determine problems and purport modifications for survey design (Lavrakas, 2008). Data collected from the cognitive interview were drawn from to construct slight language changes rendered to fit the population of interest. A pilot test was then conducted by sending a link to the Qualtrics® powered survey via email to a total of 79 alumni students. The pilot test group participants all graduated within the past three years from the Agricultural Sciences department and were deemed representative of the population of interest. Complete responses were collected from 19 individuals.

Cronbach's alpha measures the internal consistency or the extent to which items in an instrument are inter-correlated and has been the most widely used reliability coefficient for tests with levels of agreement (Cronbach, 1971). Cronbach alpha reliability coefficients were α = .91 for proficiency, α = .72 for importance. Achieving reliability when personality variables are measured can be difficult; therefore, reliability coefficients of .60 to .70 are acceptable (Ary, Jacobs & Sorensen, 2010).

After the pilot test was conducted, face-to-face contact was made with the faculty in the Agricultural Sciences department who were teaching courses during the fall 2017 semester to explain the research project and distribute an informative letter explaining the purpose and objectives of the study. Increased response rates tend to occur when prior notification of a survey has been accomplished (Dillman, 2000). A link to the survey was emailed to a census of the 17 faculty members in the Agricultural Sciences department requesting they post the link for their students in the campus' online course management system. Follow-up emails were sent in weeks two, three, and five to the faculty again requesting distribution of the survey link to the students enrolled in their course. Direct student contact was made by a member of the research team by attending an Agricultural Business and an Agricultural Education lecture during the regularly scheduled time. We described the relevance of the study and requested completion of the questionnaire. Some faculty members did not permit us to have direct student contact in their course and some provided incentives for completion.

To increase response rate, during the fifth and final week of data collection, an additional email was sent from the departmental undergraduate academic coordinator in the student services office to students to encourage completion of the questionnaire. Email messages from the academic coordinator are frequently received by the students and the email address was familiar. Students were reminded to take the survey only one time.

Data collection yielded 163 total responses with a 44% response rate. Initial data analysis revealed 43 incomplete responses; therefore 120 complete responses were included in the data set for further analysis. We recognized a potential limitation of the study as the extended length of the instrument possibly caused respondent fatigue and resulted in a 26% dropout rate. Instrument length was also a limitation described by DiBenedetto (2015). The representative sample was compared to the population based on gender and race ratio. We found the gender of respondents to be 63% male and 96% Caucasian, which equally represented the student population in the majors in the Agricultural Sciences department at the time of our research.

The instrument consisted of nine career readiness constructs including learning skills, life skills, career skills, social skills, interdisciplinary topics, knowledge competencies, incidental learning

skills, dispositions, and experiences. A variety of knowledge, skills, and dispositions were listed within each construct to determine students' perceived level of competency and importance of the variables. For example, the learning skills construct consisted of the following career readiness skills: contextual learning, critical thinking, initiative, perseverance/grit, problem solving, reasoning, and self-direction. After each construct, students were asked to answer who they believed was most responsible for teaching the construct in order to prepare them to be career ready. The responsibility choices consisted of *I am, my parents are, my community is, my K-12 education system is, my high school guidance counselor is, my technical school is, my college/university education is, my student organization is, and my employer is responsible*.

Data Analysis

The Borich Needs Assessment Model (1980) was used for the instrument design to rank concepts and determine priority area of need. When using the Borich Needs Assessment Model (1980), four steps were followed 1) competencies were listed 2) college students were surveyed 3) competencies were ranked; 4) high priority competencies (skills) were compared with the nine identified constructs of career readiness. Training needs are described as "a discrepancy between an educational goal and trainee performance in relation to the goal" (Borich, 1980). Using a discrepancy between two measures of an item allows respondents to provide their perceptions of competency related to the given topic and their relative belief about the importance of the topic as it relates to career readiness. Mean weighted discrepancy scores (MWDS) were calculated to establish rankings based on priority area of need where (Discrepancy = importance level - ability level for each topic) and MWDS = [(Importance Rating - Ability Rating) x (M Importance Rating)]/ Number of Observations (Borich, 1980). The importance and competency scale used a summated rating scale ranging from *no proficiency, low proficiency, and moderate proficiency to high proficiency (1 - 4)*. The MWDS was calculated for each skill within a construct, which included the student's perceived importance and competency level. A grand (G)MWDS was then calculated from the MWDS summary data by taking each variable's MWDS, within a construct, and calculating the average. The purpose of the GMWDS was to rank each of the nine constructs by priority area of need for training and curricular modification. MWDS and GMWDS were analyzed to determine priority area needs for career readiness curricular modifications and professional development training within the department. Findings from this study can only be generalized to the respondents, Clemson University students enrolled in an Agricultural Sciences department course; however, this study may provide guidance for other departments at other institutions with similar populations to consider.

Findings

The first objective of the study was to describe the demographic and academic profile of students enrolled in any Agricultural Sciences department course at Clemson University. Refer to Table 2 for demographic data of respondents. The majority of the respondents were male (62.7%), between the ages of 17-20 (56.8%), and Caucasian (95.7 %). Most of the respondents were pursuing a bachelor's degree (90.7 %). Approximately one third of the respondents represented each of the three majors in the department (Agribusiness, 31.4%, Agricultural Education 28.0%, and Agricultural Mechanization, 23.5%); hence provided an equal distribution among the three majors in the department. Pursuing a major outside of the department was reported by 18% (n = 21).

Table 2

Demographic Data for Students Enrolled in the Agricultural Sciences Department

Demographic	***n***	***f***	%
Gender	110		
Male		74	62.7
Female		36	37.3
Age	118		
17-20		67	56.8
21-24		47	39.8
25-29		2	1.7
30 and over		2	1.7
Race/Ethnicity	120		
African American		2	1.7
Alaska Native		0	0.0
Asian		0	0.0
Caucasian/White		112	95.7
Native American		1	0.8
Multiracial or Other		2	1.7
Hispanic or Latino(a)		3	2.5
Degree	118		
Bachelors		107	90.7
Masters		11	9.3
Major	119		
Agricultural Business		37	31.4
Agricultural Education		33	28.0
Agricultural Mechanization		28	23.5
Plant and Environmental Science		1	0.8
Agriculture		15	12.7
Environmental and Natural Resources		3	2.5
Biochemistry		1	0.8
Management		1	0.8

Note. Totals may not reach 100% due to rounding.

The second objective of the study was to determine students' self perceived competency level and importance level on knowledge, skills, and dispositions needed to be career ready among the department majors (agribusiness, agricultural education, and agricultural mechanization). When assessing need by MWDS a higher positive numerical value indicates greater need for training and the discrepancy between proficiency and importance allows for the items to be ranked by priority need for each competency (Borich, 1980). The nine constructs are listed below with the highest three skills ranked by students in each of the three majors.

Problem solving (1.97), contextual learning (1.44), and critical thinking (1.32) were ranked the highest for the **Learning Skills** construct variables by Agricultural Education students (n = 33). The highest MWDS for the learning skills construct variables for Agricultural Mechanics students (n = 28) were perseverance/grit (2.20), self-direction (2.14), and initiative (2.08) and Agricultural Business students (n = 37) ranked critical thinking (2.0), initiative (1.89), and problem solving (1.79) as the three highest needs.

The highest MWDS for the **Life Skills** construct variables for Agricultural Education (n = 33) were time management (2.68), organizational skills (2.03), and goal management (1.34). Agricultural

Mechanics students (n = 28) ranked time management (3.0), accountability (1.88), and goal management (1.58) and the maximum MWDS for the life skills construct variables for Agricultural Business (n = 37) were time management (2.1), goal management (1.62), and organizational skills (1.35).

The **Career Skills** construct variables ranked highest by Agricultural Education students (n = 33) were job search skills (2.85), career decision making (2.78), and productivity (1.5). The highest MWDS for the Career Skills construct variables for Agricultural Mechanics (n = 28) were job search skills (3.21), career decision making (1.71), and productivity (1.36) and for Agricultural Business (n = 37) were career decision making (3.8), job search skills (3.65), and work habits/ethics (1.66).

In the **Social Skills** construct uppermost variables for Agricultural Education (n = 33) were integrity (.84), ethical responsibility (.78), and honesty (.72). The highest MWDS for the Social Skills construct variables for Agricultural Mechanics (n = 28) were understanding diversity (1.47), ethical responsibility (1.17), and social responsibility (.53). The highest MWDS for Social Skills construct variables for Agricultural Business (n = 37) were social responsibility (1.02), understanding diversity (.75), and both honesty and integrity (.73).

For the **Interdisciplinary Topics** construct variables Agricultural Education students (n = 33) ranked economics (3.09), global awareness (2.82), and civics (2.39) as their highest needs. The highest MWDS for the Interdisciplinary Topics construct variables for Agricultural Mechanics (n = 28) were economics (2.08), technology (2.01), and health (1.25) and for Agricultural Business students (n = 37) were global awareness (2.58), economics (2.35), and civics (2.09).

The greatest MWDS for the **Knowledge Competencies** construct variables ranked by Agricultural Education students (n = 33) were proficiency (2.16), innovation (1.64), and decision making (1.61). The highest MWDS for the Knowledge Competencies construct variables for Agricultural Mechanics (n = 28) were personal productivity (1.24), decision making (1.22), and teamwork (0.8). Innovation (1.72), decision making (1.21), and personal productivity (.91) were ranked the highest for the Knowledge Competencies construct variables by Agricultural Business students (n = 37).

The uppermost MWDS for the **Incidental Learning Skills** construct variables for Agricultural Education majors (n = 33) were decision making (1.72), proficiency (1.48), and confidence (1.26). Highest MWDS for the Incidental Learning Skills construct variables for Agricultural Mechanics students (n = 28) were confidence (2.18), people skills (1.62), and productivity (1.24) and leadership (1.76), confidence (1.66), and productivity (1.65) for Agricultural Business students (n = 37).

Within the **Dispositions** construct self-esteem (1.36), innovation (1.09), and creativity/creative thinking (.99) were ranked highest by Agricultural Education majors (n = 33) and self-esteem (1.62), self-direction/self-discipline (1.22), and creativity/creative thinking (1.02) by Agricultural Mechanics students (n = 28) while the uppermost MWDS for the Dispositions construct variables for Agricultural Business (n = 37) were self-esteem (1.54), personal productivity (1.41), and creativity/creative thinking (1.29).

The highest MWDS for the **Experiences** construct variables for Agricultural Education (n = 33) were international engagement (2.42), cross disciplinary connections (1.54), and project management (1.22). For Agricultural Mechanics students (n = 28) career related work experience/internships (1.38), cross disciplinary connections (1.26), and international engagement (1.23) were ranked the highest. Similarly career related work experience/internships (2.47), international engagement (2.43), and leadership (1.21) were ranked highest by Agricultural Business students (n = 37).

The third objective of the study was to determine students' self-perceived competency level and importance level on knowledge, skills, and dispositions required to be career ready based on the nine constructs using GMWDS. As shown in Table 3 GMWDS were ranked for all students in the Agricultural Sciences department from highest need to lowest need. Perceived areas of need were ranked as Career Skills, Interdisciplinary Topics, Life Skills, Learning Skills, Experiences, Incidental Skills, Knowledge Competencies, and Social Skills.

Table 3

Overall GMWDS for All Students Enrolled in Agricultural Sciences Department Courses During Fall 2017 Semester (N = 120)

Construct	*GMWDS*
Career Skills	1.81
Interdisciplinary Topics	1.74
Life Skills	1.59
Learning Skills	1.56
Experiences	1.13
Incidental Learning Skills	1.10
Knowledge Competencies	1.01
Dispositions	0.93
Social Skills	0.66

A comparison of the GMWDS among the three majors within the Agricultural Sciences Department was presented in Table 4. Career Skills were consistently ranked as a top priority need among students in all three majors, while Social Skills were consistently ranked as the lowest priority need. Interdisciplinary Topics and Incidental Learning Skills were consistently ranked among all three majors.

Table 4

Comparison of GMWDS Among Majors in Agricultural Sciences Department Courses During the Fall 2017 Semester

Career Readiness Construct	Grand Mean Weighted Discrepancy Scores (GMWDS) by Agricultural Sciences Major		
	Business (*n = 37)*	Education *(n = 33)*	Mechanization *(n = 28)*
Career Skills	**2.40**	1.78	1.53
Dispositions	1.29	0.76	0.78
Experiences	1.40	1.34	0.89
Incidental Learning Skills	1.36	1.08	1.12
Interdisciplinary Topics	2.13	**2.02**	1.26
Knowledge Competencies	1.10	1.48	0.96
Learning Skills	1.65	1.10	1.90
Life Skills	1.32	1.53	**1.92**
Social Skills	0.70	0.62	0.72

Note. Bold MWDS is the highest ranked construct for each major.

The fourth objective was to determine student's perception of who is responsible for teaching knowledge, skills, and dispositions within each career ready construct, within the overall department and by major. The question posed was *"Who do you believe is most responsible for teaching these .....in order for you to be career ready?"* When analyzing the data for the overall students enrolled

in an Agricultural Sciences course (N = 120), students revealed the top entities responsible for **Learning Skills** were, I am (58%), college/university education (14%), and equally responsible were parents and K-12 education (12%). For **Life Skills**, the top entities responsible were I am (60%), parents (20%), and college/university education (8%). For **Career Skills**, the top entities responsible were I am (51%), college/university education (25%), and equally responsible were parents and K-12 education (9%). For **Social Skills**, the top entities responsible were I am (57%), parents (28%), and college/university education (7.5%). For **Interdisciplinary Skills**, the chief entities responsible were college/university education (52.5%), I am (29%), and K-12 education (10%). For **Knowledge Skills**, the top entities responsible were I am (65%), parents (12.5%), and community (7.5%). For **Incidental Learning Skills**, the top entities responsible were I am (65%), student organizations (9%), and K-12 education (7.5%). For **Dispositions**, the top responsible people were, I am (67%), parents (13%), and K-12 education (6%). For **Experiences**, the chief entities responsible were I am (45%), college/university education (32.5%), and community (7%).

When analyzing the responsibility data by major, students revealed the top entities responsible for **Learning Skills** within Agricultural Education (n = 33) were I am (55%), K-12 education (18%), and a tie between parents and college/university education (9%). The top entities responsible for Learning Skills within Agricultural Mechanics (n = 28) were I am (54%), college/university education (18%), and equally responsible were parents and K-12 education (14%). The top entities responsible for Learning Skills within Agricultural Business *(*n = 37) were I am (59%), college/university education (25%), and parents (14%).

When analyzing the responsibility data by major, students revealed the top entities responsible for **Life Skills** within Agricultural Education *(*n = 33) were I am (42%), parents (21%), and K-12 education (18%). The top entities responsible for Life Skills within Agricultural Mechanics *(*n = 28) were I am (78.5%), parents (14%), and college/university education (7%). Student's perceptions of the top entities responsible for Life Skills within Agricultural Business (n = 37) were I am (59%), equally responsible were parents and college/university education (16%), and K-12 education (5%).

When analyzing the responsibility data by major, students' perceptions indicated the chief entities responsible for **Career Skills** within Agricultural Education (n = 33) were I am (42%), college/university (21%), and K-12 education (18%). The chief entities responsible for Career Skills within Agricultural Mechanics (n = 28) were I am (68%), college/university education (21%), and equally responsible were parents, K-12 education, and student organizations (3.5%). The most important entities responsible for Career Skills within Agricultural Business (n = 37) were I am (49%), college/university education (27%), and parents (11%).

When analyzing the responsibility data by major, the students revealed the most important entities responsible for **Social Skills** within Agricultural Education (n = 33) were I am (33%), parents (27%), and college/university education (18%). The chief entities responsible for Career Skills within Agricultural Mechanics (n = 28) were I am (53.5%), parents (36%), and K-12 education (7%). The chief entities responsible for Career Skills within Agricultural Business (n = 37) were I am (73%), parents (22%), and K-12 education (5%).

When analyzing the responsibility data by major, student perceptions indicated the most important entities responsible for **Interdisciplinary Topics** within Agricultural Education (n = 33) were college/university education (40%), K-12 education (24%), and I am (18%). The uppermost entities responsible for Interdisciplinary Topics within Agricultural Mechanics (n = 28) were college/university education (61%), I am (32%), and equally responsible were K-12 education and High School Guidance Counselor (3.5%). The uppermost entities responsible for Interdisciplinary Topics within Agricultural Business (n = 37) were college/university education (54%), I am (38%), and a tie among parents, K-12 education, and employer (3%).

When analyzing the responsibility data by major, student perceptions indicated the most important entities responsible for **Knowledge Competencies** within Agricultural Education (*n* = 33) were I am (48%), K-12 education (21%), and student organizations (15%). The highest entities responsible for Knowledge Competencies within Agricultural Mechanics (*n* = 28) were I am (79%), college/university education (9%), and K-12 education (7%). The highest entities responsible for Knowledge Competencies within Agricultural Business (*n* = 37) were I am (70%), K-12 education (13.5%), and community (5%).

When analyzing the responsibility data by major, students' perceptions revealed the most important entities responsible for **Incidental Learning Skills** within Agricultural Education (*n* = 33) were I am (39%), student organizations (21%), and K-12 education (18%). The chief entities responsible for Incidental Learning Skills within Agricultural Mechanics (*n* = 28) were I am (82%), K-12 education (7%), and equally responsible were parents, community, and college/university education (3.5%). The chief entities responsible for Incidental Learning Skills within Agricultural Business (*n* = 37) were I am (81%), an equal distribution between parents, community, and student organizations (5%), and K-12 education (3%).

When analyzing the responsibility data by major, the uppermost entities responsible for **Dispositions** within Agricultural Education (*n* = 33) were I am (39%), parents (18%), and community (15%). The highest entities responsible for Dispositions within Agricultural Mechanics (*n* = 28) were I am (86%), parents (7%), and equally responsible were K-12 education and college/university education (3.5%). The highest entities responsible for Dispositions within Agricultural Business (*n* = 37) were I am (73%), parents (13.5%), and community (5%).

When analyzing the responsibility data by major, student perceptions revealed the most important entities responsible for **Experiences** within Agricultural Education (n = 33) were college/university (36%), I am (27%), and equally responsibility between community and K-12 education (12%). The uppermost entities responsible for Experiences within Agricultural Mechanics (*n* = 28) were I am (64%), college/university education (29%), and equal responsibility between community and employer (3.5%). The uppermost entities responsible for Experiences within Agricultural Business (*n* = 37) were I am (51%), college/university education (27%), and both parents, community, and K-12 education (5%).

The fifth objective was to determine specific priority needs for student development to improve career readiness. When analyzing the overall GMWDS, a need was revealed for Career Skills (1.81), Interdisciplinary Topics (1.74), Life Skills (1.59), and Learning Skills (1.56). Agricultural Education students' GMWDS revealed a need for Interdisciplinary Topics (2.02), Career Skills (1.78), and Life Skills (1.53). Agricultural Mechanics students' GMWDS revealed a need for Life Skills (1.92), Learning Skills (1.90), and Career Skills (1.53). Agricultural Business students' GMWDS revealed a need for Career Skills (2.40), Interdisciplinary Skills (2.13), and Learning Skills (1.65). When analyzing the highest MWDS for each major, common themes were found among the variables within each construct and presented in Table 5.

Table 5

High Need Variables within each Career Readiness Construct (N = 98)

Construct	High Need Variables (skills) after Analyzing Highest MWDS for each Major
Learning Skills	Critical Thinking, Problem Solving, Initiative
Life Skills	Time Management, Organizational Skills, Goal Management

Table 5

High Need Variables within each Career Readiness Construct (N = 98) Continued...

Career Skills	Job Search Skills, Career Decision Making, Productivity
Social Skills	Ethical Responsibility, Honesty, Integrity, Social Responsibility, Understanding Diversity
Interdisciplinary Topics	Economics, Civics, Global Awareness
Knowledge Competencies	Innovation, Decision Making, Personal Productivity
Incidental Learning Skills	Confidence, Productivity
Dispositions	Self Esteem, Creativity/Creative Thinking
Experiences	International Engagement, Cross Disciplinary Connections, Career Related Work Experience/Internships

In view of the fact that findings revealed students reported they believed they were most responsible for teaching/learning the various constructs to be career ready, the second highest responsible entity for the constructs was analyzed to determine differences and similarities among the three majors. An overview of the second highest entities responsible for teaching career readiness constructs as perceived by post-secondary students is presented in Table 6.

Table 6

Second Highest Responsible Entity for Career Readiness Skills by Major

	Agricultural Sciences Major		
Career Readiness Construct	Education (*n = 33*)	Mechanization (*n = 28*)	Business (*n = 37*)
Learning Skills	K-12	College	College
Life Skills	Parents	Parents	Parents/College
Career Skills	College/University	College/University	College/University
Social Skills	Parents	Parents	Parents
Interdisciplinary Topics	K-12	I am	I am
Knowledge Competencies	K-12	College	K-12
Incidental Learning	Student Organizations	K-12	Parents, Community, and Student Organizations
Dispositions	Parents	Parents	Parents
Experiences	I am	College	College

Discussion, Conclusions, and Recommendations

Students in the Agricultural Sciences department at Clemson University consistently ranked career skills as a top priority need followed by Interdisciplinary Skills, Life Skills and Learning Skills. Students in all three majors (Agricultural Business, Agricultural Education, and Agricultural Mechanization) listed job search skills and career decision making as one of the highest two needs within the Career Skills construct. Productivity was listed as the third highest need for students in both Agricultural Education and Agricultural Mechanics majors. Within Interdisciplinary Topics, economics was revealed as the top need for students in Agricultural Education and Agricultural Mechanization, while students in Agricultural Business ranked economics as the second highest need. Time management was revealed as the number one need for all three majors within the Life Skills construct. Within the Learning Skills construct Agricultural Education and Agricultural Business students ranked critical thinking as one of their highest needs, whereas critical thinking was not a need among Agricultural Mechanics students. Perhaps, Agricultural Mechanics students may be more comfortable with critical thinking skills due to the requirement of a capstone project which focused on problem-based learning in an industry-related environment. Additionally, within Knowledge Competencies, decision making emerged as a common need among students in all three majors. Within Incidental Learning Skills, confidence surfaced as a need for all three majors. In Dispositions, self-esteem ranked as the highest need among students in all three majors while creativity/creative thinking ranked the third highest need among all three majors. The second highest skills were inconsistently ranked as education - innovation, mechanization - self-direction/self-discipline, and agribusiness - personal productivity.

For many of the constructs, students in all three majors agreed they were the most responsible for preparing themselves with the skills needed to be career ready; however, for Interdisciplinary Skills, students in all three majors ranked college/university education as the highest responsible entity. For Experiences, college/university education was reported as responsible by students in Agricultural Education while Agricultural Mechanics and Agricultural Business students reported *I am the most responsible*. College/university education surfaced more as a responsible entity for Experiences compared to the other career readiness skills. It is encouraging to discover post-secondary students accept responsibility for their career preparedness. It is also interesting that this group of students did not identify the employer as responsible in any construct. Perhaps this indicates that students have not yet interacted in the workforce and lack an understanding of the employer responsibilities or maybe career preparedness ends with the college degree in their minds. It would be worthwhile to determine if employers believe they are responsible for preparing their employees for the career after hire; if so, determine their perceived role and identify those skills. Administering a modified version of the instrument to agricultural industry employers who employ Clemson University graduates to determine what skills they believe are needed by the students they hire would be very beneficial.

Career Skills was one of the constructs that was ranked as the highest need when analyzing the overall GMWDS. Interestingly all three majors indicated college/university education as the second highest responsible entity to teach Career Skills. If students believe colleges and universities are responsible for teaching these skills, then the Agricultural Sciences department at Clemson University should consider how to more explicitly teach the variables within the Career Skills construct to better prepare students for a career. Reviewing existing curricula leading to capstone courses may be a priority for review of career preparedness. Our findings also helped shed some light on one of our research questions to determine who should be held accountable for career preparation for undergraduate students after themselves. This group of students believe their college/university education is responsible for teaching career skills and especially need help with job search skills, career decision making and productivity. This finding responds to Robinson, Garton and Vaughn's (2007, p. 19) question, "is it possible that colleges and universities are failing in their role to prepare graduates for the expectations of the workforce?"

We recommend taking this research one step further on Clemson University's campus using a longitudinal pre/post design to survey freshmen and incoming transfer students during their first semester and again during their last semester prior to graduation to determine how career readiness skills have developed through the student's post-secondary experience. Curricular decisions, and faculty professional development opportunities surrounding the topic of career preparedness can be offered to increase technical knowledge and assist faculty in better preparing students to be equipped for the workforce to respond to the question - do faculty believe it is their responsibility to prepare their students for careers? Other recommendations include administering the survey in a department of agriculture where more diversity in the student population exists. We also recommend developing a study for South Carolina post-secondary students at technical schools and secondary students enrolled in career and technical education courses to determine career readiness differences between post-secondary and secondary students. A modified survey could also be administered to South Carolina post-secondary faculty and/or secondary teachers to target areas where faculty and teachers need opportunities for professional development and collaborative time to discuss career preparedness. Findings from this study should be disseminated to Clemson University's Agricultural Sciences department leadership and college administration to influence change and enhance curriculum to improve student's career readiness.

Finally, as reported in the *Getting Real About Career Readiness: A Focus on Cross-sector Competencies Executive Summary* (Almada, Bramlett, & Ramirez, 2018), recommended by the AAAE NRA (Roberts, Harder, & Brashears, 2016) and conceptualized by the Model of Student Readiness in the 21st century, which includes home, community, school and world environments (DiBenedetto & Myers, 2016), the findings of this research sought to help close the gap between what employers are seeking in potential employees and the skill set college graduates are equipped with upon graduation. We believe utilizing an instrument with standard career ready constructs can help create consensus among stakeholders regarding career readiness skills required of graduates. An increased knowledge of the skills students lack within the identified areas of career readiness may assist the Agricultural Sciences department at Clemson University in providing adequate and available opportunities for students to excel by making curricular changes and adding content focused on career readiness. By addressing these shortcomings or victories, we hoped our findings would assist stakeholders with future preparedness of students to help them successfully and confidently join the workforce, while also initiating some topics for conversation among those who are perceived by the respondents to be responsible to accomplish such a challenging task.

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