Examining the Agricultural Education Fishbowl: Understanding Perceptions of Agricultural Education Stakeholders in Higher Education

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Abstract. *The integration of core academic content into the agricultural education curriculum has received a great deal of attention over the past ten years. As a result, a number of researchers sought to understand the attitudes and perceptions of stakeholders at the secondary level in order to foster collaborative relationships across domains. Though each study called for enhanced focus and support of integration and content knowledge within the teacher preparation programs, a paucity of research exists examining the perceptions of agricultural education held by relevant stakeholders in higher education. Using Q methodology to capture subjective perceptions of agricultural education, this study identified the perseptions of 23 key stakeholders in higher education. Analysis resulted in three perspectives of agricultural education: (a) Supportive Idealist, (b) Critical Academic, and (c) Progressive Agricultural Educator. The supportive idealist typology represents an overall positive view of agricultural education that sees the benefit of the program to public schools. Critical academics, typically defined by lab scientists, believe that agricultural education lacks the academic rigor to consider itself a deliverer of core academic content, and they hold a somewhat negative view of the program as it stands today. Progressive agricultural educators value the program and recognize that agricultural education serves as a support to core content instruction but not as the sole provider of core math, science, and reading concepts. Using Brunswik's social judgment theory (SJT), keys for collaboration are presented for each perceptions.*

The evolution of agricultural education has experienced an emphasis on integrating core subject content, such as science and math, into agricultural education classes nationwide. The focus on integration followed a report from the National Research Council (NRC) in 1988 that called for agriculture courses to be expanded to increase the rigor of math and science content in order to better prepare students for careers in a changing agricultural industry. More recently the National Research

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Council (NRC, 2009) published a report asserting that through an integrated science approach agriculture can effectively meet the food, ecosystem, energy, and health needs of an ever-growing world. In response to the call for integration, Roberts and Ball (2009) put forth a conceptual framework depicting the idea that agricultural education can serve as both a deliverer of agricultural content and the contextual medium for the learning of science, math, and reading, but warned that this dual-purpose model will require collaboration and a reconceptualization of agricultural education at all levels.

Integration of core academic concepts into agricultural education classrooms has been shown effective in terms of increasing student academic success. Studies have confirmed the notion that teaching math (Parr, Edwards, & Leising, 2006; Stone, Alfeld, & Pearson, 2008), science (Chiasson & Burnett, 2001; Enderlin, Petrea, & Osborne, 1993; Myers & Dyer, 2006; Roegge & Russell, 1990) and reading (Park & Osborne, 2007) in the context of agricultural education can lead to higher academic achievement in each respective area. Though academic achievement increased as a result of science integration, Roegge and Russell (1990) specifically suggested "teacher education faculty should work closely with faculty in other disciplines to prepare teachers who are well versed in integration instruction" (p. 30) in order to address issues related to content knowledge. Myers and Dyer (2004), in an analysis of teacher education literature in agricultural education, recommended that, "once this information [research validating the effectiveness of core content integration] is obtained, studies are needed to identify the best methods teacher educators can employ to prepare teachers for this expanded role" (p. 50).

In order to better prepare teachers, research has been conducted to identify the attitudes and perceptions of agricultural teachers toward science integration (Balschweid & Thompson, 2002; Conroy & Walker, 2000; Dyer & Osborne, 1999; Myers & Thompson, 2009; Scales, Terry, & Torres, 2009; Warnick, Thompson, & Gummer, 2004). Each of the studies reported positive perceptions of agricultural educators toward the integration of science. However, many of these studies included a recommendation to augment the core academic content curriculum required at the undergraduate levels and provide additional in-service and pre-service workshops in order to enhance agricultural educators' comfort level with academic content. Scales, Terry, and Torres (2009) found that although secondary agricultural educators were confident in their ability to teach science concepts, they did not have an acceptable level of scientific competence. The study recommended augmenting the number of science-based courses into the teacher education program. The recommendation to integrate science, math, and reading into agricultural education will require support from instructors who

specialize and teach those core content courses at the college level.

Studies conducted at the secondary level (Pavelock, Vaughn, & Kieth, 2001; Thompson, 2001) found that principals, counselors, and superintendents held positive perceptions of the role agricultural education plays in supporting instruction in core academic areas, but felt agricultural teachers could benefit from more collaboration with core content experts in order to be more fluent and confident when teaching math, science and reading concepts. Dyer and Osborne (1999) reported a different perspective. They found that counselors question the value of agricultural education and that counselors' opinions were typically related to interaction with the instructor and the discipline they personally taught. Results reported by Thompson (2001) and Pavelock, et al., (2001) demonstrated that school administrators felt that the integration of core content into agricultural education programs could increase the viability of the program through a closer alignment with state and national standards. The administrators concurred that this philosophical shift would require collaboration and adjustments by everyone from higher education to local high school teachers.

In response to the national discussions around academic integration, Myers and Thompson (2009) conducted a Delphi study that produced a list of actions to move agricultural education forward in the area of math, science, and reading integration. The suggested reform called for enhanced curriculum, professional development centered on integration, augmentation of teacher preparation programs to include more core content instruction, a philosophical shift towards integration by the agricultural education profession, and collaboration between core content area instructors and agricultural educators. Collaboration at the secondary level has been examined and recommendations to enhance co-curricular efforts have been offered throughout the literature (Conroy & Walker, 2000; Dyer & Osborne, 1999; Myers & Thompson, 2009; Parr, Edwards, & Leising, 2006; Pavelock, Vaughn, & Kieth, 2001).

In order for agricultural education to move forward to the next level of the new integration, agricultural education as a field must become less independent in its research and more openly collaborative and interdisciplinary (Osborne, 2011). Myers and Thompson (2009) extend the notion of interdisciplinary collaboration explaining that teacher education programs could be a catalyst in helping the profession move forward in terms of integrating academics. Teacher education programs in both science and agriculture could better support secondary teachers by collaborating to provide materials, guides, and ongoing mentoring throughout the integration process (Grady, Dolan, & Glasson, 2010). The literature is clear in making the recommendation that collaboration should first begin in higher education, within programs to prepare

teachers, in order for students to adopt collaborative behaviors. One suggestion by Warnick, Thompson, and Gummer (2004) called for teacher education programs in agricultural education to model collaboration by designing courses that bring together both core academic content faculty and agricultural educators to facilitate interdisciplinary team teaching.

In response to societal changes, agricultural education has adopted a more interdisciplinary role by emphasizing science, technology, engineering, and math (STEM), which are inherent to the study of agriculture (Myers & Dyer, 2004). This focus on interdisciplinary integration has been a focus of many interested in moving beyond education reform and into the transformation of America's educational system (Futrell, 2010). Futrell argued that transformation

> will require faculty to remove the silos within schools and across university campuses and collaborate with one another and key community members to prepare prospective educators who will inherit the responsibility for redesigning America's schools for the realities of more interactive, interdisciplinary learning environments. (Futrell, 2010, p. 432)

Although researchers have consistently called for collaboration among a myriad of partners within higher education, a paucity of research exists regarding the perceptions of agricultural education held by members of that population. Removing barriers to collaboration at the secondary level must begin with the modeling of collaborative behavior within communities in higher education (Conroy & Walker, 2000). In order for agricultural education to move forward in fostering collaborative relationships with academic departments in higher education it is imperative that the views of key stakeholders at the university are better known. Therefore the purpose of this study was to describe the perceptions of those in higher education toward the agricultural education program at the secondary level.

Research Problem and Purpose of the Study

As the necessity to integrate core academic content into agricultural education increases, so does the need for collaboration at all levels. The primary interest was to identify, among stakeholders in higher education, the variety of perceptions about agricultural education at the secondary level in order to better foster collaboration. Specifically, two research questions drove the study: (1) What are the various perception typologies held by individuals in higher education regarding agricultural education? And, drawing on Brunswik's (1952) social judgment theory, (2) What views comprise the latitudes of rejection, acceptance, and non-commitment for the identified perception typologies?

Theoretical Framework

The theoretical framework used for the study was social judgment theory (SJT) (Hammond, Rohrbaugh, Mumpower, & Adelman, 1977), which highlights the concept that individual's judgments and decisions play a large role in their attitude and willingness to participate in collaborative efforts. Stephenson, Warnick, and Tarpley (2008) recognized the importance of judgment in the decision to collaborate within agriculture education and thus stated "additional research to examine territorial contention and competition between academic departments and agricultural departments is recommended. Research should focus on resolving misconceptions and superiority inculcations of academic departments and agriculture departments" (p. 116). SJT assumes that people rarely have direct access to the true state of what they are asked to judge (Hammond, Rohrbaugh, Mumpower, & Adelman 1977). In the context of the study, higher education faculty members are asked to judge the secondary agricultural education program without direct access. Instead, the environment gives rise to a number of cues such as interaction with agricultural education staff, with agricultural education students, or through lived experiences that are of imperfect validity and reliability but serve as the base for inferences. The zone of ambiguity lies between the cues and the true and judged states. It is this space that evokes different judgment processes and that makes judgment tasks difficult. Cooksey (1996) expounded, "this zone [of ambiguity] represents the region of entangled probabilistic relationships with which a decision maker must cope in order to successfully achieve in the decision task" (p. 11). Hammond, Stewart, Brehmer, and Steinmann (1975) add that the zone of ambiguity "is the source of the human judgment problem, as well as the source of the misunderstanding and disputes that occur when judgments differ" (p. 275).

SJT was grounded in Brunswik's (1952) "lens theory" (see Figure 1) and was later taken up by Hammond, Kaplan and Schwartz (1975) and Cooksey, Freebody, and Davidson (1986) in order to expand its use to include the study and description of how human judgments are formed with relation to decision-making. SJT assumes that a person's own attitude serves as a judgmental standard and anchor. Sherif, Sherif, and Nevergall (1965) explained that opinions on any subject are placed on a continuum in reference to that judgment standard. Opinions that most characterized the individual's own opinions are in the latitude of acceptance. Opinions that are determined to be most objectionable by the judger are placed in the latitude of rejection, and the latitude of non-commitment consists of opinions that are neither accepted nor rejected. The greater the discrepancy between a judger's opinion and the opinion being presented, the less change in attitude occurs. SJT demonstrates the

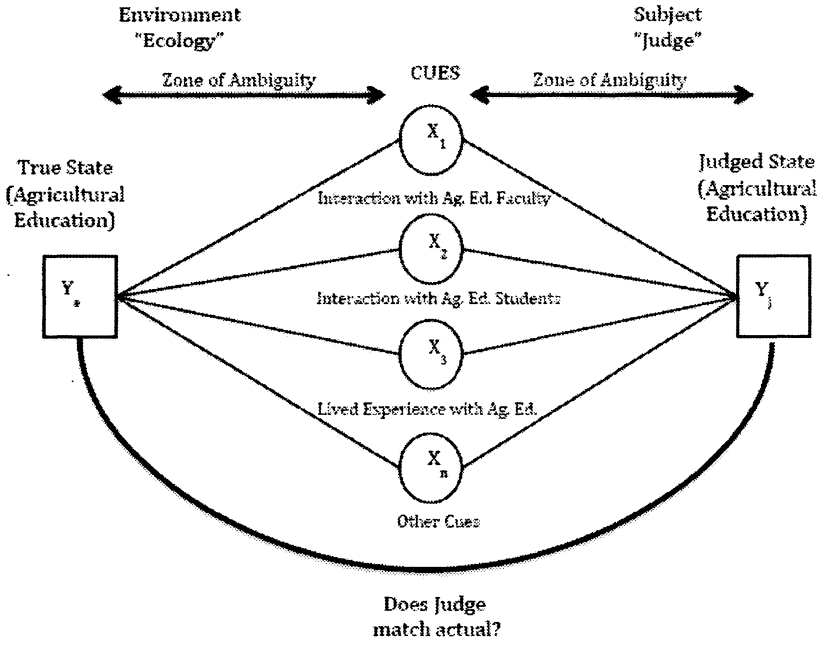

Figure 1. Bruswik's Lens Model Adapted for the Study of Human Judgment in the Context of Agricultural Education and Social Judgment Theory

(Adapted from "Judgment Analysis: Theory, Methods, and Applications," by R. W. Cooksey, 1996, p. 12.)

importance of people's prior attitudes as they seek to collaborate.

For this study, interpretation was extended to include the identification of the latitudes of acceptance, rejection, and non-commitment based on the SJT theoretical framework (see Figure 2). Statements located in the +5, +4, and +3 columns were interpreted to determine the latitude of acceptance, and statements located in the –5, –4, and –3 columns were interpreted to determine the latitude of rejection. All statements falling between the +2 and –2 columns were used to interpret the latitude of non-commitment.

Methodology

Q methodology was determined to be the best research design to describe the subjective views of stakeholders from different disciplines in relation to one another. Subjectivity in Q methodology allows each point of view to be expressed through a sorting procedure (McKeown & Thomas, 1988). Q methodology, which was developed by William Stephenson in 1935, is a research method that seeks to study points of

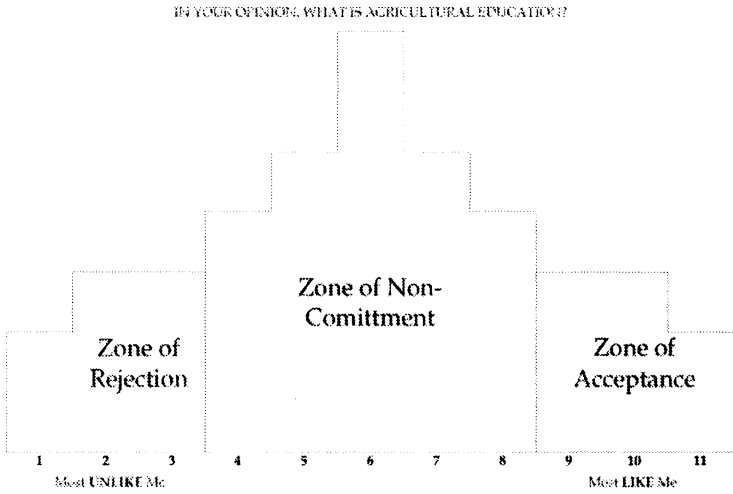

Figure 2: Form Board as Interpreted by Social Judgment Theory

view on a specific topic resulting in viewpoint typologies as a result of factor analysis. Q methodology draws on both qualitative and quantitative analyses to understand in depth the points of view on a subject (Tuler, Webler, & Finson, 2005). Unlike traditional factor analysis where the correlations between items are of importance, Q methodology utilizes factor analysis to systematically correlate the individuals who complete a sort (Brown, 1980). Individuals are asked to represent their own frame of reference by sorting statements that reflect possible opinions on a subject. Through purposive selection of individuals with unique points of view, Q researchers can reveal patterns of thought regarding any given subject, in this case, higher education stakeholders' perceptions of agricultural education.

It is worth noting the differences between Q and R methods in order to fully understand the decision to utilize Q methodology for this study. Brown (1980) provided three main differences between Q and R methodologies. The first major difference is the phenomena of interest. In R methodology, the phenomena of interest are the traits, attributes, or characteristics that are presumed to be objective and measurable within each subject. Q methodology focuses on the whole response or individual's sort as the phenomenon of interest, which is presumed to be nonfractional and subjective. Second, Brown distinguishes between the meaning of populations and samples used in R and Q methods. In R methods population refers to persons contained within a boundary of interest and a sample is a sample of that population. Q methodology uses the population to describe all the possible opinions that exist about

an element of interest, known as the concourse, and a sample (Q sample) is a subset of the population that portrays the full range of the views. Finally, Brown explains that R methodologies require subjects to choose from categories and scales that are determined a priori and work on the premise that a large enough *n* [person sample] cancels out private meanings and the average is an expression of the true meaning. In contrast, Q methodology utilizes a small person sample and the meaning of items is apprehended a posteriori, after the subject has attributed meanings to items. Brown stated that, "the importance of a factor cannot be determined by statistical criteria alone, but must take into account the social and political setting to which the factor is organically connected" (p. 42). R methods provide a perspective that is external while Q methodology provides a perspective that is internal. Brown concludes the comparison of Q and R methodologies with the explanation that "they represent fundamentally distinct methodological systems that are more often supplementary than complementary, each providing an angle on human behavior that is missing in the others" (pp. 175–176). Neither one is necessarily better, but rather, they differ.

Instrument Development

The concourse represented the possible perceptions of university faculty toward agricultural education and was approached through a review of literature (Balschweid & Thompson, 2002; Dyer & Osborne, 1999; Myers, Thoron, & Thompson, 2009; Pavelock, Vaughn, & Kieth, 2001; Thompson, 2001; Warnick, Thompson, & Gummer, 2004) as well as through ten naturalistic interviews with various stakeholders in higher education at Oklahoma State University. Interviews were conducted via social media channels as well as through direct interviews. Sampling the concourse for the Q set was done by using a one by five conceptual framework resulting in 41 statements as shown in Table 1.

Table 1: Conceptual Categories of the Q Set

Concept	*Description of Concept*	*Number of Statements*
Context	Agriculture education is the context by which core concepts are taught.	9
Content	Agriculture education is responsible for teaching agricultural content.	9
Affective	Agricultural education promotes positive self-concept.	9
Social	Agricultural education builds society-ready citizens.	9
Other	Other statements outside four constructs	5

The statements were organized to reveal five homogenous concept groups. Heterogeneity was then sought within each concept in order to present different ways of approaching the overall concept.

Participants and Procedure

The P set for this study consisted of 23 individuals, 14 males and 9 females, who were involved in higher education and specifically in areas that are of value to the agricultural-education teacher-preparation program. The participants were purposively chosen to provide an understanding of the perceptions held by individuals in higher education in relation to the secondary agricultural education program. Among the 23 participants, 20 identified themselves as white, two as American Indian, and one as Latino. These individuals were professors, student affairs faculty, university staff, and graduate students from both within and outside of the agricultural education academic unit at Oklahoma State University. "Within agricultural education" was defined as individuals who were employed through the Department of Agricultural Education, Communications, and Leadership at Oklahoma State University. "Outside of agricultural education" included other faculty and staff of Oklahoma State University who had exposure to agricultural education, but were not directly employed or involved with the agricultural education department. Individuals both inside and outside of the department were selected in order to better understand the congruence of the perceptions held by both groups. The researcher knew the initial participants while subsequent participants were recruited using a snowball technique. Each participant was given a description of the study and, if they were willing to participate, completed a consent form (approved through the university's Internal Review Board) before data were collected in Spring, 2011.

Participants were read the condition of instruction: "In your opinion, what is agricultural education?" and were given the sorting cards. As prescribed by McKeown and Thomas (1988), participants were first asked to read through the cards to become familiar with them, and to sort the cards into three piles: (a) statements they agreed with, (b) statements they disagreed with, and (c) statements that they were either neutral or uncertain about. Participants then proceeded to fill in a form board moving back and forth from most like to most unlike their opinion, leaving the middle column to be filled in last. Once the sort was completed, participants were encouraged to share any of their ideas about the sort and/or their individual opinion on the condition of instruction, which was captured by the researcher and would later help in factor interpretation. Finally, each individual was asked if they would volunteer to be contacted by phone in order to conduct member checks of factor interpretation. Seven follow-up interviews were conducted

involving high and pure loaders in each of the three perceptions. PQMethod 2.11 was used to carry out three sets of statistical procedures, including correlation of all statements within a sort to all other sorts, factor analysis of the correlation matrix, and the computation of factor scores.

Interpretation was based on the factor arrays. Brown (1980) shared that the importance of a factor cannot be determined by statistical criteria alone, but must take into account the social and political setting to which the factor is organically connected" (p. 42). The interpretive process involved analysis of each statement in relation to others and thereby coming to a sense of the overall viewpoint. Peer debriefing was utilized in order to gain feedback on the emergent themes arising from the array. Special attention was given to the statement in the +5, +4, and +3 array positions as well as those in the -5, -4, and -3 array positions as those statements provided insight into strong beliefs held by a defining sorter. Statements placed in the -2, -1, 0, +1, and +2 columns by the defining sorters indicated an ambivalent or neutral sentiment towards the statement. Interpretation includes careful use of the distinguishing statements for each array. These statements are highlighted because they identify which statements distinguish one array from another.

Results

The chosen solution involved a three-factor principal component analysis followed by a varimax rotation. Examination of the factor matrix (see Table 2) for the purpose of finding the sorts that best define the final factor array was done by choosing sorts that were statistically-significant (0.43 for this study) for only one factor.

Loadings that are in boldface met the criterion and are used when defining the factor and its meaning. The factor loading demonstrates the level of similarity. For example, sorter number seven would be considered a high and pure loader as she loaded relatively high on the first factor and low on the other two. The sorts of high and pure loaders most closely define the sort, and as such, these individuals were contacted in order to confirm the interpretation of the factors. Where a Q sort loaded highly on more than one factor, like sort number six, the sort was not used to define the factor and was considered to be a confounding sort. If a sort did not meet the statistical level of significance on any of the factors, it was not considered to be a defining sort. In this study, fourteen sorts defined the first factor, four defined the second, and two defined the third. None of the sorts were non-significant in this study and three were considered confounded. Another statistic of note is the correlations of the three factors to each other. All were low: r = $-0.10_{(1\text{-}2)}$; $0.29_{(1\text{-}3)}$; and $0.03_{(2\text{-}3)}$, indicating that the solution chosen

represented different viewpoints.

Table 2: Factor Matrix with Bold Marking Defining Sorts

Sort#/ Gender	*Age*	*Yrs. Exp.*	*Professional Area*	*Factor Loadings*		
				1	*2*	*3*
1-male	33	11	Ed. Faculty	**0.73**	0.12	0.23
2-female	29	2	Ed. Faculty	**0.82**	0.04	0.35
3-male	47	17	Ed. Faculty	**0.71**	-0.22	0.13
4-female	52	14	Ed. Faculty	**0.85**	0.12	0.17
5-male	63	NA	Student Affairs	**0.71**	-0.05	0.39
7-female	36	14	Ed. Staff	**0.80**	0.09	0.12
8-female	50	30	Ed. Staff	**0.79**	-0.14	0.10
9-male	56	25	Ed. Faculty	**0.77**	-0.33	0.18
10-female	40	4	Ed. Staff	**0.69**	-0.09	0.38
11-male	46	5	Ed. Staff	**0.54**	0.01	-0.04
12-female	64	27	Ed. Faculty	**0.76**	-0.34	0.09
17-female	53	32	Ag. Sciences Faculty	**0.77**	0.28	-0.10
19-female	24	0	Ag. Ed. Staff	**0.68**	0.11	0.34
21-male	31	7	Ag. Ed. Staff	**0.49**	-0.06	0.43
13-male	58	37	Science Faculty	0.23	**0.53**	-0.31
14-male	50	31	Ag. Ed. Staff	-0.18	**0.69**	0.39
16-male	60	36	Ag. Sciences Faculty	0.08	**0.77**	-0.06
18-female	48	25	Ag. Sciences Faculty	-0.33	**0.72**	0.11
20-male	49	25	Ag. Ed. Staff	0.43	0.09	**0.49**
22-male	36	11	Ag. Ed. Staff	-0.04	-0.06	**0.78**
6-male	35	1	Ed. Faculty	0.47	0.44	0.46
15-female	31	3	Ag. Sciences Faculty	0.51	0.15	0.66
23-male	47	23	Ag. Ed. Staff	0.62	0.05	0.62
Number of sorts defining a factor				14	4	2
Explained Variance				38%	11%	13%

Note. Factor loadings in boldface indicate a defining sort.

Research Question One

Three factors emerged from the analysis. Each of these factors represents a perception one in higher education may hold with regard to agricultural education at the secondary level. Each factor is described in narrative form to portray the perception of those who defined the specific perception. Specific statements will be provided to support the concepts that drive the narrative, as the perceptions are based on the reconstructed factor arrays (noted in parentheses with the statement number and factor score). The appendix provides the full factor arrays.

Perception A: Supportive Idealist. A supportive idealist sees the agricultural education cup as half full. With the exception of two agricultural education staff, this perception represents an outside view of the agricultural education "fishbowl". An overview of important statements can be found in Table 3. Defining sorts included six faculty members from the College of Education, a professional within the College of Education, three staff members from the College of Education, a student affairs administrator, one faculty member in agricultural sciences, and two staff members in agricultural education. Six males and eight females made up this perception. Ages ranged from 29 to 64 years and years of work experience ranged from 0 to 30 years. Much of their exposure to the topic is through students they have worked with, agricultural education teacher education faculty, or through intermittent exposure in the rural communities in which they live and work.

These 14 individuals in higher education (out of 23 total sorts) are critical to the success of collaborative efforts. Three concepts arose in the interpretation of this perception. Supportive idealists overwhelmingly support the first concept that agricultural education is a valuable part of any secondary school. As administrators, school faculty, and community members make decisions regarding how to best develop their students, agricultural education is an item worthy of attention and funding (27, +4). Attending livestock exhibitions, career development events, leadership seminars, and other activities specific to the program, provide hands-on opportunities for learning and are of value (40, +5). Most importantly, those activities can have value in augmenting the school curriculum (39, -4). Though agriculture has changed a great deal, agricultural education remains relevant and necessary (9, -5). Agricultural education programs are important to communities and bring together a number of people who are interested in the education of an area's youth (30, +4). As one participant shared, "agricultural education is many kids' 'thing.' Students are involved in band, sports, art, and . . . ag. It is really important for those students. It is the way some students express their gift. It is a great program for kids."

Table 3: Supportive Idealist Array Statements

No.	*Statement*	*Factor Score*
40	It presents students a refreshing, hands-on, experiential approach to learning.	+5
13	It makes confusing math and science concepts easier to understand by putting the concepts in a real-world context.	+5
30	Agricultural education programs are important components of a community.	+4
18	Agricultural education supports the intellectual growth of students.	+4
27	It is a good investment of school funds.	+4
39	There is little educational value to the livestock exhibitions, FFA contests, and extracurricular student projects. It is just that—extracurricular.	−4
8	High school agricultural teachers know a lot about agriculture, but are not qualified to teach core concepts such as science, math, and reading.	−4
15	Agricultural education has no business teaching students core subjects like science, math, and language arts.	−4
9	It is out of date and impractical in today's high schools	−5
35	Students involved actually develop poor academic and personal habits.	−5
	Important distinguishing statements	
40	It presents students a refreshing, hands-on, experiential approach to learning	+5
27	It is a good investment of school funds	+4
34	Students in the program are more financially responsible as a result of record keeping and work with personal projects.	+2
35	Students involved actually develop poor academic and personal habits.	−5
15	Agricultural education has no business teaching students core subjects like science, math, and language arts.	−4
8	High School agricultural teachers know a lot about agriculture, but are not qualified to teach core concepts such as science, math, and reading.	−4

The personal growth of students is a second concept of particular interest. An individual whose sort defined this perception shared that "I can almost always identify which students were a part of 4-H [an rural youth development program] or the FFA [secondary school-based agricultural program] within a couple of days. It is really amazing how much they stand out. I've always thought it was such a great program." Anybody who feels that agricultural education develops poor habits

within students must not have a full understanding or experience with the program (35, -5). Agricultural education plays an important role in connecting students with the community and develops citizens who can be contributors to any society (30, +4). One example of this is the financial responsibility that is developed through the management of student projects (34, +2). Students are learning important life skills that may not be tied to academics, but are critically important. Through exposure to new experiences, students experience intellectual growth that carries over into their work in academic content areas (18, +4). In general, agricultural education contributes strongly to the holistic growth of students.

Though the magic is really in the development of the whole student, an excellent by-product is the support of academic success, which was the third concept to emerge. Secondary agricultural educators have a unique opportunity through hands-on experiential activities to support math, science, and language arts skills through contextual learning (40, +5). Those teachers are competent enough in the various content areas to insert academic learning into their lessons (15, -4; 8, -4). Many students who struggle to be successful in the standard textbook learning environment of today's high schools find that agricultural education is where confusing math and science concepts become easier to understand and are more relevantly applied to real-world contexts (13, +5).

Perception B: Critical Academic. Critical academics are usually professors in some type of hard science. These professors are both within and outside of the college of agriculture and play an important role in teaching agricultural education students core science and math classes such as biology, agronomy, and agricultural engineering. Specifically, this perception included one faculty member in science, two faculty members in agricultural sciences, and one in agricultural education. Thus, this perception included individuals viewing agricultural education from both inside and outside of the fishbowl. The age range of those defining this perception was 48 to 60, and years of experience ranged from 25 to 37 years. Three males and one female defined this perception. Key statements are found in Table 4.

Concept one highlights the idea that critical academics are not sold on the academic rigor associated with the secondary agricultural education program. Agricultural education is the study of agriculture and anyone who identifies it as a rigorous math or science class has clearly not had adequate exposure to the curriculum or does not have adequate awareness of what academic rigor involves (10,-5). Agricultural education has a clear purpose, but it is not to enhance core academic content (16,-4). This lack of rigor is further validated through

standardized test scores; agricultural students do not score significantly higher than their peers not in the program (11,–4). Let us all be honest, it is claimed: agricultural education is about teaching leadership and citizenship to students (31, +4) and the program remains primarily vocational. One such critical academic shared that she had taught biology at one point in her career and said, "I simply didn't see the rigorous science that I taught in the agricultural education programs I got to witness. It has its place but not as a science class."

Table 4: Critical Academic Array Statements

No.	*Statement*	*Factor Score*
28	The culture is close-minded and lacks diversity in demographics and thought.	+5
37	The agricultural education community is typically not very interested in collaboration.	+5
40	It presents students a refreshing, hands-on, experiential approach to learning.	+4
31	It is really about teaching leadership and citizenship to students.	+4
24	It provides a place for students to feel like they belong in schools.	+4
23	High achieving students are drawn to the program.	–5
10	The program is a rigorous science or math class in the context of agriculture.	–5
11	It enables students to perform better on standardized exams.	–4
16	The primary purpose of agricultural education is to support and enhance core academic content instruction.	–4
38	If I were an administrator of a school system, agricultural education would be an important component of the curriculum.	–4
	Important distinguishing statements	
28	The culture is close-minded and lacks diversity in demographics and thought.	+5
37	The agricultural education community is typically not very interested in collaboration	+5
40	It presents students a refreshing, hands-on, experiential approach to learning.	+4
23	High achieving students are drawn to the program.	–5
10	The program is a rigorous science or math class in the context of agriculture.	–5
11	It enables students to perform better and standardized exams.	–4

A second concept is that those of this perception are not impressed by the culture of agriculture education. The agricultural education community is close-minded and lacks diversity in both thought and demographics (28, 5). It is rarely interested in collaboration (37, +5), which is unfortunate because there is real value in the refreshing experiential approach agricultural education brings to the academic table. If an administrator had to make tough decisions regarding programs to include in a high school, agricultural education wouldn't be a priority in a school (38, -4).

Finally, this perception is built on the concept that the agricultural program does have value—one cannot deny that. Students love the opportunity to get outside, work with their hands, learn experientially, and compete in various contests (40, +4). However, high achieving students are not drawn to agricultural education (23,-5), which is a result of the lack of rigor and vocational nature of the program. Agricultural education is a place where lower achieving students can really find a place in high schools (24, +4).

Perception C: Progressive Agricultural Educator. Progressive agricultural educators are unique in that they acknowledge what is instead of idealizing what agricultural education should be. One individual whose sort defined the progressive agricultural educator array shared that, "throughout the sort I was thinking of the 'ought' versus 'is' debate—what ought the program become and what is the program. I have an idea of what it ought to be in my mind, but that is not what it is currently." Two males defined this perception, ages 36 and 49, with 11 and 25 years of professional experience. While only one sorter (22) was a "pure loader", the perception is important for the purposes of the study. Both individuals were faculty members in the agricultural education department at Oklahoma State University. Key statements are found in Table 5.

One concept that was foundational to this perspective is that agricultural education holds value for a diverse student population. This perception believes that all students, regardless of race, academic ability, hometown demographics, socio-economic status, interest, or career choice can benefit from agricultural education, as indicated by strong position of statement 6 (6, +5). One of the most important components of agricultural education really lies in the opportunity for students to connect on a more personal level with an adult educator while in school (20, +4). Though academics are always a focus of an educational setting, it is acceptable for students to let their hair down and have fun at times (19, +4) as this holds academic value in and of itself.

Everyone is affected by agriculture and thus it is important for all students (6, +5). Confining agricultural education to rural and / or

technical schools is a mistake as it can be molded to fit students in all settings (1, -5; 4, -5). Agricultural education is not just for college-bound students, but can support students in choosing a number of paths, including college and/or vocational options (12, -4).

Table 5: Progressive Agricultural Educator Array Statements

No.	*Statement*	*Factor Score*
6	Agriculture, as a field, was the first science and any student, whether rural or not, can benefit from learning about agriculture broadly defined.	+5
11	It enables students to perform better on standardized exams.	+5
19	Students are involved because they really just want to have fun.	+4
20	Is unique in that the teacher serves as a role model and builds deeper and more meaningful relationships with the students in and outside of the classroom.	+4
13	It makes confusing math and science concepts easier to understand by putting the concepts in a real-world context.	+4
1	It gets greater commitment in technical schools rather than in high school.	-5
4	It is only viable in rural communities where production agriculture is practiced.	-5
39	There is little educational value to the livestock exhibitions, FFA contests, and extracurricular student projects. It is just that - extracurricular.	-4
16	The primary purpose of agricultural education is to support and enhance core academic content instruction.	-4
12	Involvement in agricultural education prepares students for any college degree program.	-4
	Important distinguishing statements	
11	It enables students to perform better on standardized exams.	+5
23	High achieving students are drawn to the program.	+2
17	Studying agriculture naturally includes the study of math, science, reading, and writing - it doesn't require special attention to integration.	+2
1	It is gets greater commitment in technical schools rather than in high school.	-5
4	It is only viable in rural communities where production agriculture is practiced.	-4
10	The program is a rigorous science or math class in the context of agriculture.	-3

A second concept emphasizes the idea that agricultural education supports academic performance in a wide range of disciplines. Agricultural education is truly a support system for core academic instruction (13, +4). Supporting the instruction of the core academic curriculum should always be encouraged, but agricultural education is not a rigorous math, science, or language arts class (10, -3) and to make it that is a diversion from the true purpose of the program (16, -4). Progressive agricultural educators believe that the many activities offered through agricultural education contribute to the overall success and growth of a student (39, -4). As researchers, they have seen evidence that agricultural education enables students to perform better on standardized exams (11, +5), but it is more a result of overall student development, motivation, mentorship, and contextual learning.

Research Question Two

A number of concepts were derived through interpretive analysis of the collections of statements found within the zones, or latitudes, of rejection, non-commitment, and acceptance (according to Figure 2; see p. 80) for each factor. Those concepts were then used to develop collaboration strategies for each perception.

Supportive Idealist Collaboration Strategy. Three concepts were identified, one in each of the zones of rejection, non-commitment, and acceptance, which provided the foundation for the collaboration strategy. When seeking to collaborate with supportive idealists, it is important to capitalize and focus on the idea that agricultural education develops students both intellectually and personally (18, +4; 35, -5). They believe it is a good investment of funds, and thus, are willing to discuss and explore ways to integrate agricultural education into high schools (27, +4). One idea that supportive idealists will accept and act upon is the idea that there is value in the varied method of instruction utilized by agricultural education (40, +5). Agricultural education serves a certain population of students and stakeholders should be proud of that (13, +5). When working with supportive idealists, it is important to avoid discussing the idea that agricultural education is becoming out of date and impractical (35, -5). Individuals who hold this view are made uncomfortable by the idea that agricultural educators are unfit to teach core concepts (15, -4; 8, -4), and do not support the notion that agricultural education is best for rural communities only (4, -3). This violates their "idealistic" view of agricultural education. Those that hold this perception do not feel strongly about academic rigor (10, 0), discussion of college preparation (12, 0), or the idea that agricultural education is the answer to low standardized test scores (11, -1). They see agricultural education as a support to core academic content, but won't commit to the idea that the program includes core science, math,

or language arts course (17, 0). Finally, these individuals are indifferent about the idea that agricultural education is the best program for students, since they do not emphasize choice (2, +1; 3, 0).

Critical Academic Collaboration Strategy. Collaboration with a critical academic can be difficult, but is possible. A friendly and humble demeanor is key to the zone of acceptance. Critical academics hold the opinion that agricultural educators are not interested in collaboration and are close-minded (37, +4; 28, +5). Acknowledging that as a weakness and demonstrating a desire to partner in order to enhance rigor can foster more positive attitudes around collaboration. Discussions around the important role agricultural education can play in a community (30, +3) and in the development of students (25, +3) could gain traction, as these are key positive perceptions of a critical academic. Focus first on the strengths that agricultural education offers as an elective (41, +3). Critical academics do not buy into the idea that agricultural education is about core academic rigor (10, -5; 11, -4; 16, -4). One runs the risk of paralyzing collaborative efforts by starting with the idea that agricultural education is currently a rigorous math or science course in the context of agriculture as this concept is clearly in the latitude of rejection for this perception. Convincing this group that the academic achievers are found in agricultural education will be met with heavy resistance. These individuals are not interested in the "feel good" benefits of the program such as meaningful relationships with teachers (20, 0), drive (21, 0), society-ready citizens (33, +1), and the idea that FFA represents what is right with today's youth (29, -1). The various contests, events, conferences, and traditions that those involved in agricultural education hold dear are not of interest to this group (39, 0) as their focus is on academics and rigor.

Progressive Agricultural Educator Collaboration Strategy. Collaboration with those of this perception should begin with the idea that agricultural education develops the whole person, which leads to growth both academically and personally. It is important to broaden one's perception when discussing for whom the program can have impact, because progressive agricultural educators believe all students can benefit (6, +5; 9, -3). One unique discussion point within the latitude of acceptance is the idea that there is value in the "fun" that students have while enrolled in an agricultural education course (19, +4). Those of this perspective are proud life-long supporters of the program, but understand it is not perfect. They find value in being proud of what agricultural education does and whom it serves, but are always looking for ways to move agricultural education forward. While collaborating with a progressive educator, one might avoid labeling agricultural education as a math, science, or language arts course (10,-3; 16, -4), yet still find common ground in the idea that the program supports the core

academic teachers in the learning process. The most prominent theme in the latitude of rejection for progressive agricultural educators is the idea that the program is for rural communities focused on production agriculture. This idea fails to value the power of agricultural education for all students (1, -5; 4, -5). These individuals are not interested in discussing the current culture of the profession, as they are looking to the future (28, +1). The idealized view is not of interest to these individuals as they have been around long enough to know what is, and is not, occurring in secondary agricultural education programs (40, 0; 29, 0).

The power of this perception is not necessarily in the need for collaboration, as only those in agricultural education define it. However, by juxtaposing the latitudes of rejection and acceptance of both the critical academics and the progressive agricultural educators, promising areas of collaboration arise which will be further explained in the conclusion section that follows.

Conclusion

The purpose of this study was to better understand the perceptions held by individuals in higher education regarding agricultural education in order to better foster collaboration related to the idea of core content integration. Three distinct perspectives of agricultural education were identified as a result of the study: (a) supportive idealists, (b) critical academics, and (c) progressive agricultural educators. The first perception, which was defined by 14 of the 23 sorts, was named the supportive idealist and represents the dominant view of the "fishbowl" population, from which collaboration is sought. Those whose sorts defined this view hold a positive perception of agricultural education and what it can do not only for the personal growth of students, but for the support it provides to the teaching of core academic content. This view seems to be congruent with a number of studies that reported the perceptions of science teachers, principals, superintendents, counselors, agricultural educators, and parents as generally positive (Balschweid & Thompson, 2002; Dyer, & Osborne, 1999; Johnson & Newman, 1993; Myers, Thoron, & Thompson, 2009; Pavelock, Vaughn, & Kieth, 2001).

Agricultural educators should move forward in terms of fostering collaboration with faculty and staff that define a supportive idealist. In the present study, this perception was largely comprised of professors and staff members within the college of education, and thus, could be a group of individuals that hold promise in regards to collaboration. Although some may have noted territorial contention and competition between departments (Stephenson, Warnick, & Tarpley, 2008), the findings of this study suggested that is not the case when working with those of the supportive idealist view. It is important to note that a

number of professors within agricultural education share this viewpoint with faculty in other departments. This is beneficial in terms of healthy discussions around collaboration and the tearing down of the departmental silos discussed by Futrell (2010) in order to move towards school transformation. Research should be conducted in order to better understand whether the idealist view is stable. Are these individuals simply restating agricultural education rhetoric they have been exposed to or are these beliefs and perceptions anchored in lived experiences? At the bottom line, the fact that so many partners of agricultural education hold such a supportive and idealistic view—whether stable or not—of agricultural education, is encouraging as the profession seeks to build the collaboration within higher education that has been repeatedly called for in the literature.

Critical academics represent a much different perception that warrants careful attention as agricultural educators seek to enhance the science and math coursework within the agricultural education teacher preparation program. Those of this perception are not impressed with the academic rigor of agricultural education and are not sold on the value of the program as it stands today. Professors of sciences, either in agriculture or life sciences, predominantly defined this perception in this study. The literature has consistently called for augmented science and math courses at the college level (Grady, Dolan, & Glasson, 2010; Scales, Terry, & Torres, 2009) and critical academics are important in making that recommendation a reality. This perception presents an important distinction between secondary science teachers' perceptions towards the integration of core content and that held by scientists within higher education. Secondary science teachers tend to see the value of agriculture education in the integration of core academic content, but critical academics do not. Roberts and Ball (2009) asserted that if agricultural education seeks to teach core concepts in the context of agriculture, the profession must commit to preparing teachers to do that adequately. Although agricultural educators perceive themselves as competent in science, Scales, Terry, and Torres (2009) exposed the fact that in reality, selected teachers in Missouri "do not have an acceptable level of competence in the subject area of science" (p. 108) as determined by scores on a science knowledge examination. Individuals of this view have seen the lack of science knowledge in action and have thus developed the perception described as a critical academic.

It is imperative that efforts be devoted to rebuilding a positive, collaborative relationship with individuals of this opinion, as they are key stakeholders in helping agricultural educators be more proficient in the integration of core content. They view agricultural educators as close-minded and not interested in collaboration. However, there are areas of the program they see as valuable such as the refreshing,

experiential, hands-on approach to learning provided by the program. These individuals are not impressed by the traditions and "feel good" elements of agricultural education, but can be drawn back into collaboration through healthy and honest conversations around the need to enhance rigor. Supportive idealists may further the frustration of critical academics through the sharing of an idealist view of core content integration, but progressive agricultural educators have a unique perception that could be valuable in repairing this important partnership.

Progressive agricultural educators have a sincere belief in the program and support it whole-heartedly, but they are more realistic in their description of agricultural education. This perception could be valuable in forming collaboration with hard scientists who have concerns of the rigor of agricultural education curriculum. This view shared the sentiment provided by Scales, Terry, and Torres (2009) that "the conventional wisdom of integrating more science, mathematics, and reading into the secondary agriculture curriculum must be carefully considered" (p. 109). Progressive agriculturists agree that this shift towards rigorous science integration must be carefully evaluated and would disagree with Pavelock, Vaughn, and Kieth's (2001) suggestion that an increase in academic rigor is needed despite of the fact that experiences like "showing livestock and judging contests" (p. 481) would receive less emphasis. Those of this perception would argue that experiences are not merely extracurricular, but are experiential learning activities, when framed correctly, and hold great value in terms of personal and academic development. Research around the true benefits of these experiences that have always been integral to agricultural education should be conducted to better understand the effect they have on personal development and academic achievement in core content areas.

Progressive agriculturists see the value of increasing the focus and attention given to the integration of core academic contents, but don't neglect to honor the other elements of agricultural education that may be what truly has a positive effect on students. An honest and forthright discussion of what agricultural education is, and what it ought to be, would help foster collaboration between stakeholders in higher education. This debate is occurring nation-wide within the profession, and thus, it is recommended that a Q study be conducted to understand the various perception among leaders of agricultural education concerning what agricultural is, and what it ought to be. Examining the fishbowl from within would expose valuable perceptions that could foster conversations leading to a strengthened voice and concerted effort in ensuring that agricultural education remains viable in today's changing society.

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Appendix: Q Statements and Rankings

No.	Statement	Perception		
		1	2	3
1	It gets greater commitment in schools rather than in high school.	0	1	−5
2	High schools must recruit students interested in agriculture as it is a vital career for the future of our country and thus needs a qualified work force.	1	−1	3
3	Agriculture affects everyone and is a priority in any student's high school experience.	0	−2	−1
4	It is only viable in rural communities where production agriculture is practiced.	−3	0	−5
5	It plays an important role in developing necessary skills for employment in business and industry.	1	−1	3
6	Agriculture, as a field, was the first science and any student, whether rural or not, can benefit from learning about agriculture broadly defined.	3	2	5
7	Because of increased graduation requirements, there is little time for students to enroll in agricultural education courses.	0	−1	0
8	High school agricultural teachers know a lot about agriculture, but are not qualified to teach core concepts such as science, math, and reading.	−4	2	1
9	It is out of date and impractical in today's high schools.	−5	0	−3
10	The program is a rigorous science or math class in the context of agriculture.	0	−5	−3
11	It enables students to perform better on standardized exams.	−1	−4	−5
12	Involvement in agricultural education prepares students for any college degree program.	0	−3	−4
13	It makes confusing math and science concepts easier to understand by putting the concepts in a real-world context.	5	−3	4
14	The program is a great example of teacher collaboration in terms of integrating core curriculum into agricultural classes.	2	−2	−2

No.	Statement	Perception		
		1	2	3
15	Agricultural education has no business teaching students core subjects like science, math, and language arts.	-4	-1	-1
16	The primary purpose of agricultural education is to support and enhance core academic content instruction.	-1	-4	-4
17	Studying agriculture naturally includes the study of math, science, reading and writing - it doesn't require special attention to integration.	0	-3	2
18	Agricultural education supports the intellectual growth of students.	4	-2	1
19	Students are involved because they really just want to have fun.	-1	2	4
20	Is unique in that the teacher serves as a role model and builds deeper and more meaningful relationships with the students in and outside of the classroom.	3	0	4
21	Students involved in the program are more motivated and goal driven than their peers.	1	0	-1
22	It is the best place for lower-achieving students to experience success and build confidence.	-2	1	3
23	High achieving students are drawn to the program.	0	-5	2
24	It provides a place for students to feel like they belong in schools.	1	4	2
25	It is more about developing students than building academic knowledge.	-1	3	1
26	It does little to motivate students to be involved in school.	-3	-2	-2
27	It is a good investment of school funds.	4	0	0
28	The culture is close-minded and lacks diversity in demographics and thought.	-2	5	1
29	It represents what is right in today's youth.	-1	-1	0
30	Agricultural education programs are important components of a community.	4	3	0
31	It is really about teaching leadership and citizenship to students.	3	4	-2
32	It serves as a vital bridge between the community and public education.	2	1	0
33	It develops contributing, proud, and society-ready citizens.	1	1	0
34	Students in the program are more financially responsible as a result of record keeping and work with personal projects.	2	0	-3

No.	Statement	Perception		
		1	2	3
35	Students involved actually develop poor academic and personal habits.	-5	1	-1
36	The program causes students to miss too many hours of classroom instruction.	-3	2	-1
37	The agricultural education community is typically not very interested in collaboration.	-2	5	-2
38	If I were an administrator of a school system, agricultural education would be an important component of the curriculum.	2	-4	2
39	There is little educational value to the livestock exhibitions, FFA contests, and extracurricular student projects. It is just that—extracurricular.	-4	0	-4
40	It presents students a refreshing, hands-on, experiential approach to learning.	5	4	0
41	It is simply another elective students can choose based on their interest.	-2	3	1