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Seth B. Heinert
Ogallala (NE) High School

Nathan W. Conner
University of Nebraska - Lincoln, nconner2@unl.edu

T. Grady Roberts
University of Florida, groberts@ufl.edu

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School-Based Agricultural Education Students' Attitudes and Beliefs toward International Agricultural Concepts

Seth B. Heinert

Ogallala High School

Nathan W. Conner

University of Nebraska-Lincoln

T. Grady Roberts

University of Florida

The purpose of this study was to determine the attitudes and beliefs of school-based agriculture education (SBAE) students toward international agricultural concepts. This study builds on several previous studies (Conner, Greer, & Stripling, 2017; Elliot & Yanik, 2002; Heinert, Lavery, & Roberts, 2014; Radhakrishna, Leite, & Domer, 2003). To explore new geographic regions of the United States, two states, one from the Midwest and one from the Northwest, were purposively identified. A 46-item instrument that measures attitudes, beliefs, understanding, and instruction in relation to international agriculture developed by Radhakrishna et al. (2003) was administered to students in three schools representing both rural and urban areas. A total of 133 surveys were returned, for a 55.2% response rate. Overall, students held positive attitudes and beliefs toward international agricultural concepts. Students expressed a need to understand basic geography in relation to international agricultural concepts, and students strongly agreed to concepts and information necessary to understand international agricultural concepts. When historical data were synthesized with data from this study, mean scores from all five studies across all four constructs were consistently high. Future research should focus on how students develop their attitudes and beliefs about international agriculture.

Keywords: School-based agricultural education, international agriculture, attitudes, beliefs

Introduction

The agriculture industry is a global enterprise (FAO, 2010). Globalization has affected nearly every facet of agriculture, from production to input supplies, and marketing and distribution. Today, one need only walk through a grocery store and read the country of origin or attempt to find the origination of a favorite candy bar to quickly realize that globalization has touched every part of the agricultural industry.

Direct correspondence to Nathan W. Conner at nconner2@unl.edu

Agriculture, like other sectors, operates increasingly across international boundaries, with even fresh fruits and vegetables shipped around the world; this introduces a complex regulatory regime, transportation logistics, and the need to work with different cultures, laws, and individuals. This intertwining of agriculture, culture, regulations, and concerns makes critical the need for professionals who have international exposure and sensitivities. (National Research Council, 2009, p. 31)

As the world's population increases to an estimated 9.5 billion people by 2050, agriculture finds itself in the world's eye as many work to tackle complex issues such as food security (FAO, 2009). While much within the agricultural industry happens at the local level, few can doubt the globally connected nature of today's agricultural industry.

As a result of a globally connected world, education and training for an effective agricultural workforce must include at least an international dimension to meet demands from the agricultural industry (Harder et al., 2015). To succeed in today's ever more globalized world, students must think globally and be able to consider different cultural perspectives (Crawford & Kirby, 2008).

For the U.S. food and agricultural sector to be in a position to compete in the global markets of the 21st century, the food and agricultural education system must be expanded and strengthened to address the challenges and opportunities facing the global food system. (Mercier, 2015, p. 1)

The Longview Foundation (2008) issued a report describing a globally competent student as one that "can describe a body of knowledge about world regions, cultures, and global issues, and skills and dispositions to engage responsibly and effectively in a global environment" (p. 7). Many in higher education in agricultural education and Extension have recently shown interest in and written about efforts to provide education and training for staff, pre-service teachers of agriculture, and Extension agents (Conner & Roberts, 2013; Conner, Roberts, & Harder, 2013; Foster, Rice, Foster, & Barrick, 2014; Rice, Foster, Miller-Foster, & Barrick, 2014) on topics related to international agriculture and globalization.

Over the years, international programming and curricula have existed within agricultural education. Ibezim and McCracken (1994) reported that well over half (58%) of instructors of agriculture in 12 states from the Midwest reported teaching international topics in agriculture. Further, Michigan developed a manual called *Internationalizing Agricultural Education Programs* in the late 1980s (Hossain, Moore, & Elliot, 1995). After teachers had been using the manual for a few years, Hossain et al. (1995) found that, overall, teachers in Michigan had positive attitudes toward including an international focus in their curriculum compared to teachers who had not used the manual. Since that time, little empirical evidence exists to suggest that SBAE (school-based agriculture education) is using curricula with an international focus.

The National FFA Organization offers some international programs, such as the International Leadership Seminar for State Officers, FFA Stars and Proficiency Travel Seminar, and the National FFA Officers Global Experience (FFA, 2015). While the programs offered by the National FFA are impactful to participants, they have a limited capacity, only affecting a few hundred students per year. Also, the 2009 student delegation to the National FFA Convention called for greater opportunities for global engagement within agricultural education (National Council for Agricultural Education, 2011). This ultimately led to the creation of *A Strategy for Enhancing Global Engagement in Agricultural Education* (The National Council for Agricultural Education, 2011), a published document that presents ideas to increase the global engagement that takes place in middle school, high school, and university agricultural education programs.

The agricultural industry demands a globally minded and competent university graduate (National Research Council, 2009). Colleges of agriculture in many states have tasked themselves with providing international experiences for their students to fulfill these industry needs (Etling & Barbuto, 2002; Irani, Place, & Friedel, 2005). However, there is currently no national curricula for international agriculture for SBAE. Beyond the current efforts of the National FFA Organization, little is done to influence the behaviors of SBAE students to develop global competencies. Creating a national curriculum focused on producing globally-minded high school students (SBAE) would help to prepare high school students that are knowledgeable about international agriculture.

A series of studies using a virtually identical instrument and similar methods that span over a decade informs SBAE concerning the attitudes and beliefs of students related to international agriculture. Elliot and Yanik (2002, 2004) surveyed high school students of agriculture in Arizona and found they had neutral to low attitude and belief scores toward international agricultural concepts. Radhakrishna et al. (2003) found that high school students in Pennsylvania had somewhat higher attitude and belief scores toward concepts of international agriculture than those of Elliot and Yanik (2004). Heinert et al. (2014) found that, overall, Florida students from two high schools had positive attitudes and beliefs toward international agricultural concepts. Finally, when Conner et al. (2017) repeated the study in Tennessee, they found that, once again, students held positive attitudes and beliefs toward international agricultural concepts. Collectively, these studies originate from the southwest, southeast, and northeast U.S., leaving a gap in knowledge about the attitudes and beliefs toward international agricultural concepts of students from the Midwest and Northwest.

Two priorities of the *National Research Agenda of the American Association for Agricultural Education* (AAAE; Roberts, Harder, & Brashears, 2016) were addressed by the present study: Priority 3 – Sufficient Scientific and Professional Workforce that Addresses the Challenges of the 21st Century and Priority 4 – Meaningful, Engaged Learning in All Environments. This study aligns with the AAAE research priorities by allowing the profession to better understand the needs and interests of high school students in the area of international agriculture. Findings

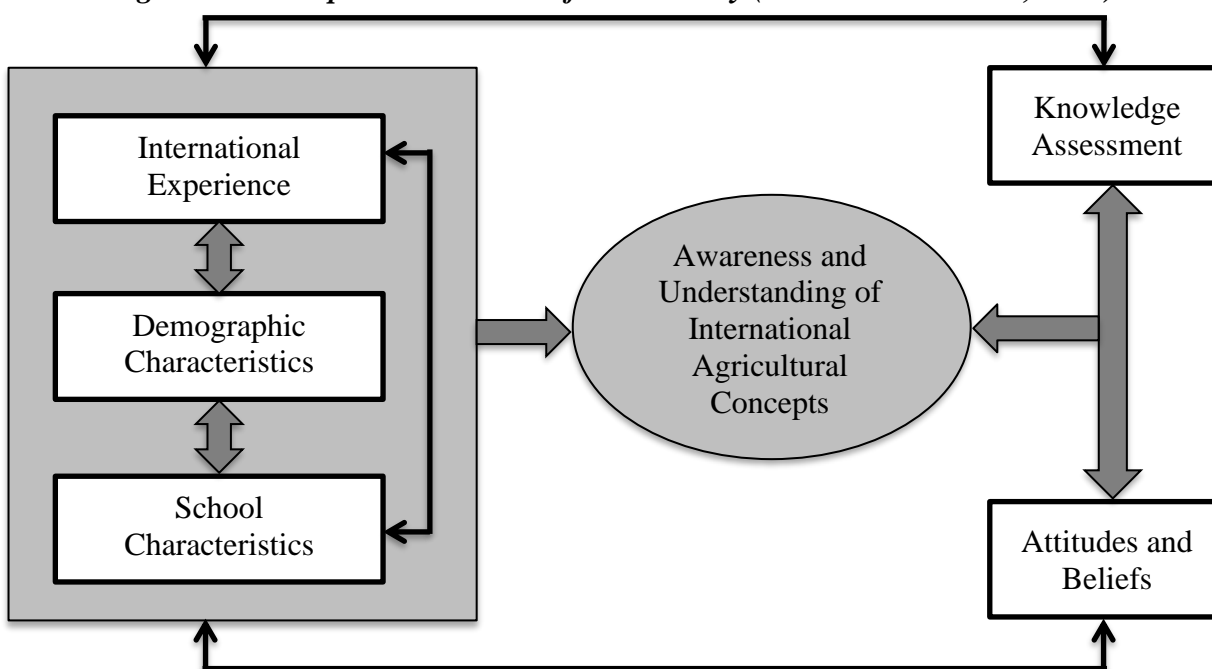
from this study will add to the literature base and help agricultural educational professionals meet the needs of a diverse audience.

This study fills a necessary research gap by providing evidence, both geographically and temporally, that when synthesized with previous studies, creates a holistic national perspective of students' attitudes and beliefs toward international agricultural concepts. The collective findings will inform international agriculture curricular efforts by providing a foundation of international agricultural concepts for curricular writers to integrate into curricula. There is value in repeating research with similar methods but in a different context (Ary, Jacobs, Sorensen, & Razavieh, 2010). While purposive samples cannot be generalized to a greater audience (Ary et al., 2010), several purposive samples, taken from a large geographic area and gathered over time, help to form a relatively cogent picture of a phenomenon.

Theoretical Framework

This study was guided by the theory of planned behavior (Ajzen, 1985). The constructs of Ajzen's theory of planned behavior consist of a) attitude toward the behavior, b) subjective norm, and c) perceived behavioral control. According to Ajzen, an understanding of the three primary constructs indicate an individual's general intention to act (Ajzen, 1985). Based on this, the attitudes and beliefs that high school students carry toward international agricultural concepts indicate their intentions, and consequently, their behavior. SBAE programs hoping to influence the behavior of program graduates to pursue international coursework and experiences in post-secondary education or global careers must understand the attitudes and beliefs of their students to influence such behavior. A conceptual framework (see Figure 1) developed by Radhakrishna et al. (2013) was used to depict how attitudes and beliefs, knowledge, demographic characteristics, school characteristics, and international experiences may influence an individual's awareness and understanding of international agricultural concepts.

Figure 1. Conceptual Framework for this Study (Radhakrishna et al., 2003)



Purpose and Objectives

The purpose of this study was to determine the attitudes and beliefs of SBAE students toward international agricultural concepts. Specific objectives of the study were to:

- 1) Determine, using primary data, the attitudes and beliefs of students toward international agricultural concepts.
- 2) Determine, using primary data, student's views of the importance of concepts to be included in curricula design for a better understanding of international agriculture.
- 3) Determine, using primary data, if attitudes, beliefs, understanding, and attitudes toward instruction in relation to international agriculture concepts differ based on gender and school.
- 4) Compare historical and primary findings on attitudes, beliefs, understanding, and instruction toward international agricultural concepts.

Methodology

This study was descriptive in nature and utilized a 46-item instrument. The instrument was based on a survey designed by Radhakrishna et al. (2003), which was adapted from an instrument developed by Elliot and Yanik (2002). Based on Radhakrishna et al. (2003), the 46-items were categorized into four constructs: attitudes toward international agricultural concepts, beliefs toward international agricultural concepts, understanding of international agricultural concepts, and attitudes toward instruction of international agricultural concepts. Additionally, 11 questions focusing on participant background and demographics were included in the

questionnaire. Demographic questions were the same questions used in previous studies (Conner et al., 2017; Heinert et al., 2014; Radhakrishna et al., 2003) and focused on sex, class standing, school location, size of graduating class, and whether or not the participant lived on a farm. Each question/statement used a five-point Likert rating scale to measure the participants' responses. The rating scale consisted of the following: 1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Neutral*, 4 = *Agree*, and 5 = *Strongly Agree*. Radhakrishna et al. (2003) established content and face validity for the questionnaire by using four experts. Post hoc reliability analysis allowed us to determine the reliability of the instrument: attitudes toward international agricultural concepts (14 items, $\alpha = 0.89$), understanding of international agricultural concepts (6 items, $\alpha = 0.90$), beliefs toward international agricultural concepts (13 items, $\alpha = 0.86$), and attitudes toward instruction of international agricultural concepts (13 items, $\alpha = 0.90$).

To expand upon previous studies (Conner et al., 2017; Elliot & Yanik, 2002; Heinert et al., 2014; Radhakrishna et al., 2003), two states were purposively identified to participate in this study to explore a new geographic region of the United States. This study included one Midwestern state (Nebraska) and one Northwestern state (Oregon). One teacher educator in each of the two states was contacted and asked to identify urban and rural SBAE programs that would be willing to participate in this study. The teacher educators provided contact information for the participants.

Four schools were identified by the teacher educators and contacted. Three of the four schools agreed to participate and represented both urban and rural populations. School A is a large (2,300 students) urban high school in Oregon. The school is located just outside a metropolitan area. School A has over 130 faculty and staff members and offers many co-curricular and extra-curricular activities for its students. School B is a small (94 students) rural high school in Nebraska. The school is located in the north-central part of Nebraska and employs 26 certified staff members for the entire school district. School C represents a small (324 students) rural high school in Oregon. School C is a charter school and is the only high school in its school district.

The target population for this study was the SBAE population of students at the three schools that were selected for this study. However, the majority of the potential participants were under the age of 18 and required parental consent to participate in the study. The lack of returned parental consent forms was a limitation of the study and contributed to lowering the response rate. School A had 75 of its 103 SBAE students complete the questionnaire, school B had 46 of its 55 SBAE students complete the questionnaire, and school C had 12 of its 83 students complete the questionnaire. The total response rate was 55.2% of the target population. Hard copies of the questionnaires and the IRB parental consent forms were mailed to each of the three SBAE programs. Each agricultural teacher verbally explained the questionnaire/study to the students and sent the parental consent forms home with the students to ask for their parents' signature if they wanted to complete the questionnaire. Once the parental consent forms were returned to the agricultural teacher, the teacher had the appropriate students complete the questionnaire. Three emails were sent at one-week intervals to the agriculture teachers to remind

them to administer the survey instrument to the students who returned the parental consent form. The parental consent forms and the questionnaires were then mailed back to the researchers. Assent was implied from the return of the informed consent form and the survey. The data were compiled in a Microsoft Excel document and then analyzed using SPSS 22 to report descriptive statistics, which included means, frequencies, percentages, and standard deviations.

Results

The demographic profile of the student participants is depicted in Table 1. Most of the student participants were female (59.5%), either freshmen (32.8%) or seniors (27.5%), attended school in an urban environment (55.7%), had less than 100 (46.5%) students in their graduating class, and did not live on a farm (74.4%).

Table 1. Demographic Profile of Students (n = 133)

| Variable | f | % |
|--------------------------|----|------|
| Sex | | |
| Female | 78 | 59.5 |
| Male | 53 | 40.5 |
| Class Standing | | |
| Freshman | 43 | 32.8 |
| Sophomore | 29 | 22.1 |
| Junior | 23 | 17.6 |
| Senior | 36 | 27.5 |
| School Location | | |
| Rural | 58 | 44.3 |
| Urban | 73 | 55.7 |
| Size of Graduating Class | | |
| Less than 100 | 60 | 46.5 |
| 101-200 | 4 | 3.1 |
| 201-300 | 21 | 16.3 |
| 301-400 | 13 | 10.1 |
| 401-500 | 4 | 3.1 |
| 500+ | 27 | 20.9 |
| Live on Farm | | |
| Yes | 34 | 25.6 |
| No | 99 | 74.4 |

Note: Percentages do not calculate to 100% due to missing data

Objective one was to determine, using primary data, the attitudes and beliefs of students toward international agricultural concepts. Table 2 shows that the student participants held positive attitudes toward international agricultural concepts (Overall Mean = 4.13; *SD* = 0.52). Most (95.5%) agreed or strongly agreed with the following statement: *I should understand about agriculture and its importance to the world economy*. However, only 63.6% of the student

participants agreed or strongly agreed with the statement, *I should know more about the cultures of other countries* (3% disagreed or strongly disagreed; 33.3% neutral). The overwhelming majority agreed or strongly agreed with each item in Table 2.

Table 2. Students' Attitudes Toward International Agricultural Concepts (n = 133)

| Statement | SD % | D % | N % | A % | SA % |
|--|---------|--------|--------|--------|---------|
| 1. I should understand about agriculture and its importance to the world economy. | 0.0 | 0.8 | 3.8 | 29.3 | 66.2 |
| 2. Coming changes in world agriculture will have some impact on me in the future. | 0.0 | 0.0 | 11.5 | 50.0 | 38.5 |
| 3. World agriculture has some effect on food prices in my local grocery store. | 1.6 | 1.6 | 8.5 | 49.6 | 38.8 |
| 4. I should know more about how world agriculture affects food prices in the local grocery store. | 0.0 | 3.8 | 11.3 | 43.6 | 41.4 |
| 5. I should know more about how world events affect local agriculture in my community. | 0.8 | 1.5 | 15.2 | 48.5 | 34.1 |
| 6. World events have some impact on agriculture in my community. | 0.8 | 3.1 | 15.4 | 50.8 | 30.0 |
| 7. I should understand more about the differences between developing and developed countries. | 0.0 | 0.0 | 19.5 | 49.6 | 30.8 |
| 8. Learning more about agriculture in other countries will help me understand future changes in world agriculture. | 0.8 | 1.5 | 18.2 | 43.2 | 36.4 |
| 9. I should understand how the culture of other countries impacts agriculture in those countries. | 2.3 | 2.3 | 17.4 | 50.0 | 28.0 |
| 10. I should have a better understanding about how politics affect world agriculture. | 0.8 | 3.8 | 18.0 | 48.9 | 28.6 |
| 11. I need to know more about world agriculture. | 1.5 | 3.0 | 18.8 | 42.9 | 33.8 |
| 12. I should know more about other countries as a market for U.S. agricultural products. | 0.0 | 1.5 | 26.3 | 43.6 | 28.6 |
| 13. Marketing U.S. agricultural products to other countries will help the U.S. economy. | 0.0 | 1.5 | 27.1 | 36.8 | 34.6 |
| 14. I should know more about the cultures of other countries. | 1.5 | 1.5 | 33.3 | 35.6 | 28.0 |
| Overall Mean: 4.13 (SD = 0.52) | | | | | |

Note: Scale was 1 = *Strongly Disagree* to 5 = *Strongly Agree*.

Positive beliefs, as shown in Table 3, toward international agricultural concepts were held by the student participants (Overall Mean = 3.97; SD = 0.51). Student participants recognized that agriculture involves more than farming (95.3 % agree or strongly agree). Interestingly, the overwhelming majority agreed or strongly agreed with each statement in Table 3, except the following: *That I can learn about world agriculture from listening to selected radio programs* (13.6% disagreed or strongly disagreed; 40.2% neutral).

Table 3. Students' Beliefs Toward International Agricultural Concepts (n = 133)

| Statement | SD % | D % | N % | A % | SA % |
|---|-----------------|----------------|----------------|----------------|-----------------|
| 1. Agriculture involves more than farming. | 0.8 | 0.0 | 3.9 | 17.8 | 77.5 |
| 2. That I can learn about world agriculture from attending events such as fairs or shows. | 1.5 | 1.5 | 13.6 | 48.5 | 34.8 |
| 3. Natural disasters affect the price of food in my local grocery store. | 1.5 | 1.5 | 15.2 | 47.0 | 34.8 |
| 4. U.S. trade partners (customers) help U.S. agriculture. | 0.8 | 0.8 | 18.8 | 49.6 | 30.1 |
| 5. That a variety of audio-visual materials (websites, slides, videos, films, etc.) would help me learn more about world agriculture. | 0.0 | 3.0 | 22.7 | 47.0 | 27.3 |
| 6. The U.S. should help other countries with food aid in times of famine. | 0.0 | 3.8 | 22.7 | 41.7 | 31.8 |
| 7. An understanding of other cultures will help U.S. food producers to market their products abroad. | 0.0 | 3.8 | 22.9 | 45.8 | 27.5 |
| 8. That guest speakers who are knowledgeable regarding international events would help me learn more about world agriculture. | 0.8 | 0.8 | 26.5 | 48.5 | 23.5 |
| 9. An understanding of international political issues will help U.S. producers market their products abroad. | 0.0 | 1.5 | 29.5 | 49.2 | 19.7 |
| 10. That computer programs that are internationally oriented would help me learn more about world agriculture. | 0.0 | 2.3 | 31.8 | 46.2 | 19.7 |
| 11. Competition with other producers worldwide helps keep food prices rather reasonable. | 1.5 | 7.6 | 26.7 | 44.3 | 19.8 |
| 12. That I can learn about world agriculture from watching selected television programs. | 1.5 | 6.8 | 31.8 | 45.5 | 14.4 |
| 13. That I can learn about world agriculture from listening to selected radio programs. | 3.8 | 9.8 | 40.2 | 34.1 | 12.1 |
| Overall Mean: 3.97 (SD = 0.51) | | | | | |

Note: Scale was 1 = *Strongly Disagree* to 5 = *Strongly Agree*.

Objective two was to determine, using primary data, student's views of the importance of concepts to be included in curricula design for a better understanding of international agriculture. Table 4 summarizes the findings for this construct. Student participants expressed a need to understand basic geography in relation to international agricultural concepts (Overall Mean = 4.14; *SD* = 0.58). *Understanding location of states in major regions in the United States* was agreed or strongly agreed upon by 90.8% of the student participants. Interestingly, 76.2% agreed or strongly agreed that they needed to be able to locate the countries around the world.

Table 4. Students' Perception of Geography in Relation to International Agricultural Concepts (n = 133)

| To help me understand agriculture from a global perspective, I should have a basic understanding of the United States and world geography, such as: | SD | D | N | A | SA |
|--|-----------|----------|----------|----------|-----------|
| | % | % | % | % | % |
| 1. Location of states in major regions in the United States. | 0.0 | 0.8 | 8.5 | 58.5 | 32.3 |
| 2. Major regions in the United States. | 0.8 | 0.0 | 11.5 | 51.5 | 36.2 |
| 3. The seven continents in the world. | 0.0 | 3.1 | 13.1 | 45.4 | 38.5 |
| 4. Countries that are the most densely populated. | 0.8 | 3.1 | 19.1 | 39.7 | 37.4 |
| 5. Major waterways used in shipping agricultural products. | 0.0 | 0.8 | 22.9 | 41.2 | 35.1 |
| 6. Location of countries in the world. | 0.0 | 2.3 | 21.5 | 46.2 | 30.0 |

Note: Scale was 1 = *Strongly Disagree* to 5 = *Strongly Agree*.

Table 5 identifies some concepts/information student participants felt were necessary to understand international agricultural concepts (Overall Mean = 3.97; *SD* = 0.51). *Global agriculture and the effects on American agriculture* was at the top of the list as 83.7% agreed or strongly agreed. Only 67.2% agreed or strongly agreed that information presented should not be too complex. The overwhelming majority agreed or strongly agreed with each item in Table 5.

Table 5. Students' Perception of Instruction for Understanding International Agricultural Concepts (n = 133)

| I am more likely to understand global agriculture if given instruction about: | SD | D | N | A | SA |
|---|-----------|----------|----------|----------|-----------|
| | % | % | % | % | % |
| 1. Global agriculture and the effects on American agriculture. | 0.8 | 1.6 | 14.0 | 52.7 | 31.0 |
| 2. Major agricultural products that are produced in my country. | 0.8 | 1.5 | 14.5 | 59.5 | 23.7 |
| 3. What happens to local products once they leave the community? | 0.8 | 0.8 | 18.5 | 48.5 | 31.5 |
| 4. How the U.S. works with other countries on economic issues. | 0.8 | 0.8 | 19.4 | 55.0 | 24.0 |
| 5. How the U.S. works with other countries on political issues. | 1.6 | 2.3 | 27.9 | 48.8 | 19.4 |
| 6. How the U.S. works with other countries on humanitarian issues. | 2.3 | 3.1 | 28.2 | 46.6 | 19.8 |
| A proposed set of lessons on international issues should: | | | | | |
| 7. Prepare me for future changes in global agriculture. | 0.7 | 1.1 | 15.2 | 51.1 | 31.6 |
| 8. Help me understand global agricultural marketing systems. | 0.0 | 1.5 | 16.9 | 55.4 | 26.2 |
| 9. Provide an opportunity to interact with people in other parts of the world. | 0.0 | 1.5 | 17.7 | 49.2 | 31.5 |
| 10. Help me function better as a citizen in a global society. | 0.8 | 3.1 | 19.8 | 52.7 | 23.7 |
| 11. Provide me with an appreciation of the interdependency of nations around the world. | 0.0 | 1.6 | 27.1 | 55.0 | 16.3 |
| 12. Not be too complex for me. | 0.8 | 8.4 | 23.7 | 44.3 | 22.9 |
| Overall Mean: 3.97 (<i>SD</i> = 0.51) | | | | | |

Note: Scale was 1 = *Strongly Disagree* to 5 = *Strongly Agree*.

Objective three was to determine, using primary data, if attitudes toward international agricultural concepts, beliefs toward international agricultural concepts, understanding of international agricultural concepts, and instruction of international agricultural concepts differed based on school and gender. The following two tables (Table 6 and Table 7) provide a comparison based on school and gender. School C had a higher mean score for attitudes, understanding, and instruction and was tied with School B for the highest mean score on the belief construct. Female students held higher mean scores for all four constructs than male students.

Table 6. School Comparisons on Attitudes, Beliefs, Understanding, and Instruction towards International Agricultural Concepts (n = 133)

| | School A (n = 75) | | School B (n = 46) | | School C (n = 12) | |
|---------------|-------------------|------|-------------------|------|-------------------|------|
| | Mean | SD | Mean | SD | Mean | SD |
| Attitudes | 4.07 | 0.58 | 4.19 | 0.43 | 4.26 | 0.41 |
| Beliefs | 3.91 | 0.53 | 4.02 | 0.41 | 4.02 | 0.36 |
| Understanding | 4.11 | 0.56 | 4.16 | 0.67 | 4.31 | 0.41 |
| Instruction | 3.89 | 0.55 | 4.07 | 0.46 | 4.15 | 0.36 |

Note: Scale was 1 = Strongly Disagree to 5 = Strongly Agree.

Table 7. Gender Comparisons on Attitudes, Beliefs, Understanding, and Instruction towards International Agricultural Concepts (n = 133)

| | Females | | Males | |
|---------------|---------|------|-------|------|
| | Mean | SD | Mean | SD |
| Attitudes | 4.21 | 0.46 | 4.06 | 0.54 |
| Beliefs | 3.98 | 0.45 | 3.96 | 0.51 |
| Understanding | 4.17 | 0.55 | 4.13 | 0.63 |
| Instruction | 4.04 | 0.49 | 3.93 | 0.47 |

Note: Scale was 1 = Strongly Disagree to 5 = Strongly Agree.

Objective four was to compare historical findings with the findings of this study on attitudes, beliefs, understanding, and instruction related to international agriculture concepts. Table 8 shows the comparison of five studies, four of which represent historical findings and one new finding from this study, on attitudes, beliefs, understanding, and instruction toward international agriculture concepts. Generally, the mean scores are quite high, ranging from 3.51 to 4.13 on the attitudes construct; 3.55 to 3.97 on the beliefs construct; 3.66 to 4.14 on the understanding construct; and 3.56 to 3.97 on the instruction construct.

Table 8. Comparison of Five Studies on Attitudes, Beliefs, Understanding, and Instruction towards International Agricultural Concepts

| Construct | Arizona 2002-2004 (n = 98) | | Pennsylvania 2002 (n = 62) | | Florida 2013 (n = 69) | | Tennessee 2014 (n = 123) | | Nebraska and Oregon (current study) 2015 (n = 133) | |
|---------------|----------------------------------|----|----------------------------------|------|-----------------------------|------|--------------------------------|------|---|------|
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Attitudes | 3.51 | * | 4.00 | 0.84 | 3.79 | 0.52 | 3.81 | 0.46 | 4.13 | 0.52 |
| Beliefs | 3.55 | * | 3.80 | 0.91 | 3.77 | 0.40 | 3.81 | 0.57 | 3.97 | 0.51 |
| Understanding | 3.66 | * | 4.17 | 0.73 | 3.84 | 0.58 | 3.76 | 0.51 | 4.14 | 0.58 |
| Instruction | 3.56 | * | 3.94 | 0.84 | 3.76 | 0.44 | 3.76 | 0.47 | 3.97 | 0.51 |

Note: Scale was 1 = *Strongly Disagree* to 5 = *Strongly Agree*; Standard Deviations were not reported by Elliot and Yanik (2002).

Conclusions, Implications, and Recommendations

The purpose of this study was to determine the attitudes and beliefs of SBAE students toward international agricultural concepts. Several conclusions can be drawn from the primary data collected in the current study. First, students held positive attitudes toward international agricultural concepts with an overall mean of 4.13 ($SD = 0.52$). Second, positive beliefs toward international agricultural concepts were held by the student participants with an overall mean of 3.97 ($SD = 0.51$). Third, students expressed a need to understand basic geography in relation to international agricultural concepts with an overall mean of 4.14 ($SD = 0.58$). Fourth, students strongly agreed that identified concepts and information were necessary to understand international agricultural concepts with an overall mean of 3.97 ($SD = 0.51$). Fifth, the genders and schools were found to be relatively similar on attitudes, beliefs, understanding, and instruction; however, female students held higher slightly mean scores for all four constructs than male students. Finally, adding the historical data from four studies to the present study and comparing all five studies showed mean scores across all four constructs were relatively high.

Interestingly, the items with the lowest levels of agreement were still overwhelmingly positive. The only item that did not have the majority of participants who agreed or strongly agreed was *That I can learn about world agriculture from listening to selected radio programs*. For example, over three-quarters of the participants agreed or strongly agreed that they should be able to locate countries around the world. Despite being the lowest agreed-upon item in the construct, participants seemed to have a solid understanding of the importance of being globally minded.

This study shows surprisingly similar findings to previous studies (Conner et al., 2017; Elliot & Yanik, 2002; Heinert et al., 2014; Radhakrishna et al., 2003). Collectively, these studies represent very different geographic regions of the U.S., span thirteen years, and combined

represent the perceptions of 485 purposively selected students. The instrument used for this study was very similar to the instrument Radhakrishna et al. (2003) modified from Elliot and Yanik (2002). The instrument Radhakrishna et al. used focused on the attitudes and beliefs of the participants and used a five-point Likert scale. The instrument consisted of 44 questions and was administered to high school students attending the Pennsylvania Governor School for Agricultural Sciences. Despite the instrument being over a decade old, the instrument was selected for consistency between the studies and to serve as replication. Although a random national sample would provide more generalizable results, the spatial and temporal variation provided by synthesizing these five studies does help us gain a better understanding of this phenomenon. Based on the results of this study, research should be conducted to explore international agricultural concepts that should be infused into an international agriculture curriculum for high school agriculture students.

This study was guided by the theory of planned behavior, which proposes an individual's attitude toward the behavior, subjective norms, and perceived behavioral control influence the individual's decision to act (Ajzen, 1985). Additionally, a conceptual framework designed by Radhakrishna et al. (2003) was used due to the focus on attitude and belief constructs. Given the high overall mean scores for attitudes and beliefs in both the primary data and historical data, it could be concluded that students' intentions toward learning about international agriculture concepts would also be strong (Ajzen, 1985). The participants held positive views towards learning about international agricultural concepts, and according to Ajzen (1985), people intend "to perform a behavior when they evaluate it positively" (p. 12). Further, based on the conceptual framework purported by Radhakrishna et al. (2003), the overall high attitude and belief scores should affect students' awareness and understanding of international agricultural concepts.

Teachers and curriculum writers should capitalize on these findings by developing and implementing curricula that focus on learning about international agriculture and cultural competence. This study could also be used by SBAE programs and agriculture teachers to provide evidence to take to school administrations in an effort to show the importance high school agriculture students place on International agriculture. The findings could then be used to design new courses and to supplement existing courses. Agriculture teachers could also use the data to develop both in-class learning experiences and study abroad experiences centered around International agriculture. To help future agriculture teachers, university agricultural teacher preparation programs should use this study to infuse International agriculture concepts into their teacher preparation program. By doing this, universities will help ensure that future generations receive an education centered around International agriculture. Ultimately, enabling and empowering this young generation of agriculturists will allow them to meet the call for a globally-prepared agricultural workforce (Crawford & Kirby, 2008; Longview Foundation, 2008; National Research Council, 2009).

Although the current results are insightful and provide justification for the development and implementation of an international agriculture curriculum, there are limitations to this study. This study only consisted of three schools from two states and may not accurately represent the entire Midwest and Northwest regions; therefore, the results of this study may not be generalizable. Additionally, the use of teacher educators in the respective states to identify schools that were likely to participate could have created some bias in the selection process.

A critical question unanswered by this study and the historical studies is *what experiences and activities have influenced student attitudes and beliefs about international agriculture concepts?* Future research should seek to gain an understanding of how students develop their attitudes and beliefs about international agriculture. Such knowledge will provide the greatest opportunity in building human capacity to achieve long-term impacts in addressing global food security and other mega-issues (FAO, 2009).

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Seth B. Heinert, Ph.D., is a High School Agriculture Teacher at Ogallala High School in Nebraska.

Nathan W. Conner, Ph.D., is an Associate Professor of Agricultural Education at the University of Nebraska-Lincoln. Dr. Conner contributes to the teacher education program at UNL.

T. Grady Roberts, Ph.D., is a Professor of Agricultural Education in the Department of Agricultural Education and Communication at the University of Florida.