

Preparing Agricultural Educators For The World: Describing Global Competency In Agricultural Teacher Candidates

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Abstract

Colleges of agriculture in the US have been challenged to produce candidates prepared with the knowledge, skills, and disposition to engage in a global agricultural industry. Studies show that one of the most influential factors in secondary student perceptions and outlook is their secondary teachers. The adult learning theory of transformative learning by Mezirow indicates a process of making a new or revised interpretation of the meaning of an experience, which guides subsequent understanding, appreciation, and action that is anchored in life experience. To have the most impact, experiences should be grounded in a context that students can relate. Nineteen teacher candidates participated in a course with a short term study abroad component that was grounded in global school-based agricultural education. Students were administered a researcher-developed instrument measuring knowledge, skills and dispositions of global competency three times: round I -prior to the course, round II -after the course prior to the travel experience, and round III after the travel experience. Findings indicated substantial, sustained change in the candidate knowledge, candidate perceptions of knowledge, candidate perceptions of skills, and candidate perceptions of dispositions related to global competency. Further research is recommended to measure impact on practice in the secondary agriscience classroom.

Keywords: global competency, teacher education, preservice teachers, agricultural education, South Korea

The world agriculture system is becoming increasingly integrated (FAO, 2010). Colleges of agriculture have been challenged to transform their role in higher education and their endeavors to provide a capable workforce for the ever-changing global food and agricultural system (National Research Council, 2009). Hunter, White and Godbey (2006) define global-ready graduates as globally competent individuals who have an understanding of cultural diversity as well as the social and communication skills to effectively work with diverse individuals in a variety of environments. The aforementioned researchers point to the importance of understanding globalization and an appreciation for the interconnectedness among society, environment, politics, history and economics. This combination of attitudes, knowledge and skills appears to be the recipe for success in a global context, as it is the focus of much research in the area of global competency. The literature (National Research Council, 2009) defines the need

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and importance of international experiences for collegians studying in the agricultural sciences, specifically to develop global citizenship and competency.

International experiences are valuable learning opportunities that universities need to continue to develop in response to the demands of the workforce. The most beneficial international global experience is those experiences highly related to the career goals of the participating students (National Research Council, 2009). School-based agricultural educators are placed in a position to be influential to future generations of agriculturalists (Park & Rudd, 2005). Literature (Pence & MacGillvray, 2006; Willard-Holt, 2001) indicates that even a short-term global experience by preservice teachers can impact the context and content instructed in the future and impacts multicultural competency or empathy to those not like ourselves. Additionally, with the world's increasing globalization requiring more interaction among people from varied backgrounds, the United States is now more diverse ethnically and racially than at any time in history (Cano & Martin, 2009). International education experiences have long been regarded as one means to prepare undergraduate students to participate in a world with increased ethnic and cultural diversity (Zorn, 1996). According to Walton (2002), an enhanced international perspective, or "global-mindedness," has a direct effect on a teacher's classroom communication skills and, by inference, student learning.

Internationalizing teacher education is most effectively done when global awareness and developing international understanding and perspectives are built into the teacher education preparation program (Koziol, Greenberg, Williams, Niehaus, & Jacobson, 2011). True internationalization is not as easy as creating a new major or inserting readings or assignments into existing courses (Green & Olson, 2008). True internationalization requires new pedagogies, which could include experiential, service and collaborative learning (Green & Olson, 2008).

Global competence is the knowledge, skills, and dispositions needed to function successfully in the globalized world. More specifically, it includes the ability to speak, understand, and think in a foreign language, knowledge of the global system and world history, geography, and other global issues such as health and economics, and knowledge of other cultures (Gardner, 2004; Reimers, 2009; Zhao, 2009). Although some of this knowledge and ability can be taught in existing courses, others may require adding new courses and educational activities. Thus, to cultivate global competencies in teacher candidates, teacher preparation programs are tasked with the challenge of organizing and offering such learning opportunities.

A study focusing on better engaging teacher candidates in meaningful learning experiences to help better prepare them to develop a supply of future agriculturalists directly addresses two research priority areas of the *National Research Agenda of the American Association for Agricultural Education* (Doerfert, 2011): Priority 3- Sufficient Scientific and Professional Workforce that Addresses the Challenges of the 21st Century and Priority 4: Meaningful, Engaged Learning in All Environments.

Theoretical Foundation

Mezirow's transformational learning theory which is "process of exploring, assessing, and working to change limiting frames of reference and habits of mind" served as the theoretical foundation for the study. The transformational learning theory has both individual and social dimensions and implications and calls for learners to be aware of how they come to their knowledge and for those learners to be as aware as possible about the values that lead them to their perspectives (Mezirow, 2000b). Fostering transformative learning is not just about making sense of experience through dialogue, but also involves creating experiences that can help facilitate understanding among the participants involved (Taylor, 1998).

As a theory of adult learning, transformative learning tries to "describe and analyze how adults learn to make meaning of their experience" (Mezirow, 1991, p. 198). Clark (1993, p. 47) stated, "Transformational learning shapes people; they are different afterward, in ways both they

and others can recognize.” Transformative learning is focused on the kind of learning that facilitates a deeper reflection and critical consciousness in an individual. According to Mezirow (1991), it involves “reflectively transforming the beliefs, attitudes, opinions, and emotional reactions that constitute our meaning schemes or transforming our meaning perspectives” (p. 223). Merriam and Caffarella (1995, p. 318) explained that “transformational learning theory is about change – dramatic, fundamental change in the way we see ourselves and the world in which we live.” The process of transformative learning is anchored in life experience. Mezirow (1990, p. 1) defined learning as “the process of making a new or revised interpretation of the meaning of an experience, which guides subsequent understanding, appreciation, and action.” Mezirow’s (1991, p. 167) theory is about how adults make meaning from and interpret their experiences. He defined a perspective transformation as:

The process of becoming critically aware of how and why our assumptions have come to constrain the way we perceive, understand, and feel about our world; changing these structures of habitual expectation to make possible a more inclusive, discriminating, and integrative perspective; and finally, making choices or otherwise acting upon these new understandings.

Conceptual Framework

As depicted in Figure 1, the transformative learning process in adult education involves a sequence of events. There should be an instructional foundation that assists the learner in identifying their lens or perspective on the situation. This is followed by the transformative learning life experience that includes guided reflection and discussion to challenge their current lens and gain understanding on the possible changes to that perspective (Mezirow, 2000a).

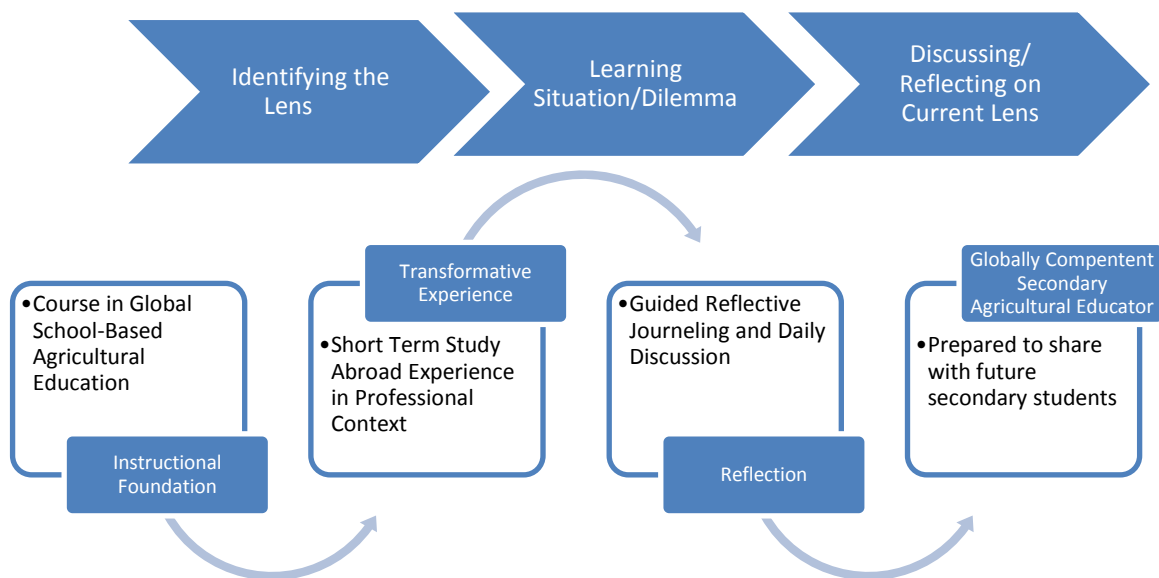


Figure 1. Conceptual Framework of Study grounded in Mezirow’s (2000a) transformative learning theory.

Purpose and Objectives

The purpose of the descriptive study was to investigate the global competency of agricultural teacher candidates participating in a contextually relevant short-term travel embedded course. The objectives that guided the study were:

1. Describe the population of teacher candidates participating in a short-term study abroad agricultural education course.
2. Describe the change in agricultural teacher candidates' perceptions of global competency knowledge from participating in a short-term study abroad agricultural education course.
3. Describe the change in agricultural teacher candidates' perceptions of global competency skills from participating in a short-term study abroad agricultural education course.
4. Describe the change in agricultural teacher candidates' perceptions of global competency dispositions from participating in a short-term study abroad agricultural education course.
5. Measure the knowledge of agricultural teacher candidates regarding South Korea.

Methods

The population of the study included 19 students from two land grant universities participating in a three-credit academic course of ten weekly sessions and an embedded ten-day travel experience to Seoul, South Korea. South Korea was selected as the location due to several factors. South Korea is one of the few nations in the world that offers both secondary agricultural education and prepares secondary agricultural education instructors at the university level. In addition, the program delivered in South Korea is similar to the US model with classroom instruction, a student organization (Future Farmers of Korea, FFK), and supervised work experience. In addition, South Korea is a developed nation with an economy that is similar in stature to the US.

Instrumentation

A researcher-developed instrument based in a review of literature was utilized to measure knowledge gains as well as perceptions of knowledge, skills, and dispositions regarding global competency. The instrument consisted of five sections: 1 - Knowledge questions; 2- Perceptions of Knowledge; 3- Perceptions of Skill, 4- Perceptions of Dispositions/Attitudes, and 5 – Demographic Questions. The fifth section was only administered with the first collection.

Section one involved 20 specific knowledge questions on South Korea, presented in Table 1. Questions were derived from the primary assigned text for the course. Sections two, three, and four involved measuring the perceptions of candidates as indicated by their level of agreement on a six-point Likert scale from 1- Strongly Disagree, 2-Moderately Disagree, 3-Mildly Disagree, 4-Mildly Agree, 5-Moderately Agree, and 6-Strongly Agree. Section two consisted of 12 items regarding perceptions of global competency knowledge. Section three consisted of 13 items regarding perceptions of global competency skills. Section four consisted of 11 items regarding perceptions of global competency dispositions. Individual items in each construct with the modal category are presented in Table 3, Table 5 and Table 7.

Section five focused on demographics of the population and only administered on the first round of data collection. Questions focused on previous academic course work on international agriculture, language skills, previous academic travel experiences, previous international travel experiences of any kind, age, gender, and class standing.

Table 1

South Korea Knowledge Questions

No.	Question Statement
1	What is the primary language spoken in South Korea?
2	What is the capital of South Korea?
3	What is the currency used in South Korea?
4	What is South Korean traditional dress called?
5	What is the staple food in South Korean Culture?
6	Which philosophies or religions have been major influences on South Korean Culture?
7	What is the official name of the country of South Korea?
8	What is South Korea's former name?
9	Which country colonized South Korea from 1910 to 1945?
10	Who is the current prime minister of Korea?
11	What are Korea's primary agricultural products?
12	What percentage of exports from Korea are agricultural products?
13	What type of government does South Korea have?
14	What kind of relationship does South Korea have with North Korea?
15	What divides North Korea from South Korea?
16	When was the Korean War?
17	What is the basis for the Korean War?
18	What countries border South Korea?
19	South Korea is bordered by which bodies of water?
20	How many days per week do South Korean children attend school?

The instrument was found to be valid for content and construct validity by a review by a panel of experts with experience in global engagement research. A cognitive interview of the instrument with a like-population member was conducted for face validity. Cronbach's alpha coefficients were computed on Likert-scale items to measure internal consistency of the items and test for its reliability (Trochim & Donnelly, 2008). Cronbach's alpha coefficients for section two global competency knowledge, was .86 for round I, .87 for round II, and .90 for round III. Cronbach's alpha coefficients for section three perceptions of global competency skills was .87 for round I, .91 for round II, and .89 for round III. Cronbach's alpha coefficients for section four perceptions of global competency dispositions was, .88 for round I, .95 for round II, and .90 for round III. All Cronbach's alpha values exceeded the acceptable levels to indicate the data should be reliable.

Data Collection & Analysis

There were three data collection points. A census of students participating was conducted for each data collection. The first collection (Round I) was prior to any class sessions being conducted (N=19). The second data collection point (Round II) was after the completion of the ten class sessions and prior to travel experience (N=19). The final collection point (Round III) was within 10 days of returning from the travel experience (N=18). One student did not complete the final collection point and the information for that student was removed from the study. Data collected were analyzed with the Statistical Package for Social Sciences (SPSS).

Findings

The findings of the study were as follows. All measures of the instrument indicated substantial, sustained change.

Objective 1: Describe the population of teacher candidates participating in a short-term study abroad agricultural education course.

The population was found to be similar to other studies of pre-service agricultural teacher candidates in the US-based agricultural teacher education programs with the range of age being 19-23 years and a majority being female (12 of 18). Twelve of the students were of upperclassmen/graduate student rank and English was the first language of all participants.

Academically, 10 students had taken course work related to international agriculture which aligns with the knowledge that an introductory international agriculture course is a required major course at one of the institutions participating. Only 2 of the 18 students had taken any language courses at the university level.

While 12 of the students had traveled outside of the US before, only three students had done so in an academic, study abroad setting. Of the 18 students, only 2 studied abroad in their high school academic career and only one had studied abroad during a previous college experience, thus 90% had not participated in a structured study abroad educational experience. No students have visited Korea and only one had previously visited Asia (China).

Objective 2: Describe the change in agricultural teacher candidates' perceptions of global competency knowledge from participating in short-term study abroad agricultural education course.

The candidates' perception of knowledge was measured with 11 individual items measured on a Likert Scale of 1 "strongly disagree" to 6 "strongly agree. Descriptive statistics for the global competency knowledge construct are reported for each of the three collection rounds in Table 2.

Table 2

Perceptions of Global Competency Knowledge

Round	Mean	Standard Deviation	Minimum	Maximum
I	3.4	.13	3.0	4.1
II	4.3	.09	3.8	4.9
III	4.5	.08	4.1	5.1

The modal category for each item in the global competency knowledge construct is reported in Table 3. Items that increased the most on the agreement scale moved from Mildly Disagree to Moderately Agree were: "*I can explain the interdependence of the global economy.*"; "*I can articulate the impact of differential access to knowledge.*" and "*I can articulate the impact of differential access to resources.*" No item decreased on the agreement scale.

Table 3

Modal Category of Global Competency Knowledge Items

Statement of Agreement	Modal Category Round I (frequency)	Modal Category Round II (frequency)	Modal Category Round II (frequency)
I am knowledgeable of current world events	Mildly Agree (6)	Mildly Agree (11)	Moderately Agree (9)
I am knowledgeable of historical factors that have shaped our current world structure.	Mildly Agree (10)	Mildly Agree (11)	Moderately Agree (8)
I am familiar with cultures unlike my own.	Mildly Agree (10)	Mildly Agree (10)	Mildly Agree (9)
I am familiar with government structures beyond America.	Mildly Agree (7)	Mildly Agree (11)	Mildly Agree (9)
I am confident in my knowledge of geography.	Mildly Agree (7)	Moderately Agree (7)	Moderately Agree (9)
I can identify transnational organizations (e.g., NGOs, Multinational organizations, etc.).	Mildly Disagree (9)	Mildly Agree (8)	Mildly Agree (10)
I can describe the nation/state system with its strengths and limitations.	Mildly Disagree (8)	Mildly Agree (11)	Mildly Agree (8)
I can explain the interdependence of the global economy.	Mildly Disagree (8)	Mildly Agree (10)	Moderately Agree (6)
I can articulate the impact of differential access to knowledge.	Mildly Disagree (7)	Mildly Agree (7)	Moderately Agree (8)
I can articulate the impact of differential access to technology.	Mildly Agree (8)	Mildly Agree (7)	Moderately Agree (9)
I can articulate the impact of differential access to resources.	Mildly Disagree (6)	Mildly Agree (10)	Moderately Agree (7)
I can describe my own culture and history in relationship to other cultures.	Mildly Agree (7)	Moderately Agree (8)	Moderately Agree (9)

Note: Statements were evaluated by participants on a Likert scale to indicate level of agreement of 1 Strongly Disagree, 2 Moderately Disagree, 3 Mildly Disagree, 4 Mildly Agree, 5 Moderately Agree, and 6 Strongly Agree

Objective 3: Describe the change in agricultural teacher candidates' perceptions of global competency skills from participating in short-term study abroad agricultural education course.

The candidates' perception of knowledge was measured with 11 individual items measured on a Likert Scale of 1 "strongly disagree" to 6 "strongly agree. Descriptive statistics for the global competency knowledge construct are reported for each of the three collection rounds in Table 4.

Table 4

Perceptions of Global Competency Skills

Round	Mean	Standard Deviation	Minimum	Maximum
I	4.1	.48	2.3	4.9
II	4.4	.35	2.6	4.8
III	4.8	.40	2.8	5.3

The modal category for each item in the global competency skill construct is reported in Table 5. The item that increased the most on the agreement scale moved from Mildly Disagree to Moderately Agree was: "I know how to overcome language barriers." The item "I am a confident traveler" decreased on the agreement scale from Strongly Agree in round I (pre-class/pre-trip) to Mildly Agree in round II (post-class; pre-trip), but returned to Strongly Agree in the final collection of data in round III (post-class, post-trip). Two other items exhibited similar changes from round I to round II: "I can use appropriate verbal and non-verbal behavior to communicate with diverse audiences." and "I can think critically about global problems and issues."

Table 5

Modal Category of Global Competency Skills Items

Statement of Agreement	Modal Category Round I (frequency)	Modal Category Round II (frequency)	Modal Category Round II (frequency)
I am confident traveler	Strongly Agree (5)	Mildly Agree (9)	Strongly Agree (8)
I love being in a new unique situation.	Mildly Agree (7)	Mildly Agree (9)	Moderately Agree (9)
I know how to overcome language barriers	Mildly Disagree (6)	Mildly Agree (7)	Moderately Agree (8)
I can work in a global setting.	Mildly Agree(8)	Mildly Agree (8)	Moderately Agree (9)
I can select and use appropriate technology and media to communicate with diverse audiences.	Mildly Agree (9)	Mildly Agree (9)	Moderately Agree (11)
I can use appropriate verbal and non-verbal behavior to communicate with diverse audiences.	Moderately Agree (8)	Mildly Agree(10)	Moderately Agree (12)
I can obtain relevant information to expand my global knowledge.	Moderately Agree (8)	Moderately Agree (8)	Moderately Agree (13)
I can develop an argument that considers multiple perspectives on global issues.	Mildly Agree (9)	Moderately Agree (9)	Moderately Agree (11)
I can demonstrate coping skills in unfamiliar situations.	Moderately Agree (8)	Moderately Agree (10)	Moderately Agree (11)
I can translate my ideas and findings to action appropriate to the situation.	Mildly Agree (9)	Moderately Agree (9)	Moderately Agree (12)
I can recognize my own world perspective	Mildly Agree (8)	Mildly Agree (8)	Moderately Agree (9)
I can converse in a second language.	Strongly Disagree (9)	Strongly Disagree (6)	Moderately Disagree (8)
I can think critically about global problems and issues.	Moderately Agree (7)	Mildly Agree (8)	Moderately Agree (10)

Note: Statements were evaluated by participants on a Likert scale to indicate level of agreement of 1 Strongly Disagree, 2 Moderately Disagree, 3 Mildly Disagree, 4 Mildly Agree, 5 Moderately Agree, and 6 Strongly Agree

Objective 4: Describe the change in agricultural teacher candidates' perceptions of global competency dispositions from participating in short-term study abroad agricultural education course.

The candidates' perception of knowledge was measured with 11 individual items measured on a Likert Scale of 1 "strongly disagree" to 6 "strongly agree. Descriptive statistics are reported for the global competency dispositions construct are reported for each round in Table 6.

Table 6

Perceptions of Global Competency Dispositions

Round	Mean	Standard Deviation	Minimum	Maximum
I	5.3	.08	4.8	5.7
II	5.2	.08	4.7	5.5
III	5.3	.04	5.0	5.8

The modal category for each item in the global competency skill construct is reported in Table 7. The item that increased the most on the agreement scale moved from Mildly Agree to Strongly Agree was: "*I feel a sense of responsibility to take action in global issues.*" No Item decreased in agreement from round I to round II to round III.

Objective 5: Measure the knowledge of agricultural teacher candidates regarding South Korea

The candidates' knowledge of South Korea was measured with 20 knowledge based questions developed from the course text. The descriptive statistics are reported for each round in Table 8.

In round I, the question most often answered correctly was: "What is the primary language spoken in South Korea?" (n=17) and "What is the capital of South Korea?" (n=17). In round II the question most often answered correctly was: "What is the capital of South Korea?" (n=18). In round III, six questions were answered correctly by everyone in the population (N=18). They were: "What is the primary language spoken in South Korea?"; "What is the capital of South Korea?"; "What is the currency used in Korea?"; "What philosophies or religions have been major influences on South Korean Culture?"; "What are Korea's primary agricultural products?" and "What countries border South Korea?"

In round I, round II, and round III, the question most often answered incorrectly was: "What percentage of exports from Korea are agricultural products?" (round I n=18; round II n=14, and round III n=14).

Table 7

Modal Category of Global Competency Disposition Items

Statement of Agreement	Modal Category Round I (frequency)	Modal Category Round II (frequency)	Modal Category Round II (frequency)
I like learning about different cultures.	Strongly Agree (10)	Strongly Agree (8)	Strongly Agree (11)
I respect cultural differences.	Strongly Agree (10)	Strongly Agree (11)	Strongly Agree (14)
I am open to trying new things.	Strongly Agree (12)	Strongly Agree (10)	Strongly Agree (13)
It is important to be aware of global issues.	Strongly Agree (14)	Strongly Agree (9)	Strongly Agree (11)
I am open to new ways of thinking	Strongly Agree (12)	Strongly Agree (9)	Strongly Agree (9)
I recognize my limitations of my knowledge and skills.	Strongly Agree (10)	Strongly Agree (9)	Strongly Agree (12)
Exploring the world is important to me.	Strongly Agree (7)	Strongly Agree (9)	Strongly Agree (11)
I value different perspectives.	Strongly Agree (9)	Strongly Agree (8)	Strongly Agree (11)
I feel a sense of responsibility to take action in global issues.	Mildly Agree (7)	Mildly Agree (8)	Strongly Agree (8)
I am motivated to seek out international opportunities	Strongly Agree (7)	Strongly Agree (7)	Strongly Agree (10)
I recognized that diverse audiences may perceive different messages from the information.	Moderately Agree (10)	Strongly Agree (7)	Strongly Agree (10)

Note: Statements were evaluated by participants on a Likert scale to indicate level of agreement of 1 Strongly Disagree, 2 Moderately Disagree, 3 Mildly Disagree, 4 Mildly Agree, 5 Moderately Agree, and 6 Strongly Agree

Table 8

Teacher candidates' knowledge score on 20-question instrument on South Korea

Round	Mean	Standard Deviation	Minimum	Maximum
I	7.4	13.8	2.0	16.0
II	12.9	6.6	6.0	17.0
III	14.6	5.7	10.0	18.0

Implications & Discussions

Based on the data collected, agricultural teacher candidates increased their knowledge regarding South Korea and their perceptions of their ability to have the knowledge, skills and dispositions of a global competent citizen. While some gains in knowledge and global competency were achieved on campus, additional gains were achieved in context.

This is a demonstration of the impact of an on-campus course on an international subject as well as the importance of the in-country international experience. The idea of internationalizing on-campus curriculum gains credibility, but the importance of encouraging students to participate in study abroad is also demonstrated.

The ultimate goal is to increase the global competency of teacher candidates, who will ultimately bring topics related to global agriculture more successfully into their secondary school-based agricultural education program, be more open to additional global opportunities, and have increased empathy for students from varied backgrounds.

Thus, potentially providing transformational life experiences per Mezirow (2000a) targeted for future secondary school-based agricultural educators with opportunity for critical reflection could shift perspectives of candidates to allow for an end gain of the meaningful, engaged learning for all environments and backgrounds. The more meaningful learning in all environments could result in a more globally prepared agricultural work force.

Recommendations

In this case, the data reinforce the importance of international education programs. Regardless of the challenge of implementing university-sponsored international programs, faculty should continue to engage and encourage these activities. The current generation of students has been raised in a time when globalization and interconnectedness are embraced, yet a true understanding of other cultures and the skills required to work in a global world remain elusive.

The current study demonstrates an immediate gain in knowledge, skills and dispositions; however, additional research is needed to determine the role that an international experience plays over the course of a teacher's career and the impact on the students with which the teacher comes into contact. Additional areas recommended for future study relating to short-term international educational experiences include:

- The long term impacts on students who participate in these experiences, including the impact on curriculum decisions and global involvement by teacher candidates as they progress in their profession.
- The trickle-down impact on future secondary students taught from teachers demonstrating a high level of global competency versus teachers who do not.
- The development of an accepted teacher global competency definition and an instrument with which teacher global competency can be measured.
- The development of an accepted global agricultural competency definition and an instrument with which global agricultural competency can be measured that is effective across all disciplines.
- Continued work with the proposed global competency instrument, including application to other embedded courses and an increase in sample size.

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