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Beliefs and Attitudes of Secondary Agriculture Teachers About Global Agriculture Issues

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Abstract

The purpose of this study was to explore the beliefs and attitudes of secondary agriculture teachers regarding global agricultural issues. A randomized national sample of 417 teachers were surveyed using a modified version of the International Agricultural Awareness and Understanding Survey (Wingenbach, Boyd, Lindner, Dick, Arispe, & Haba, 2003). Results revealed agriculture teachers had positive personal beliefs about global agriculture. Teachers also had favorable attitudes about what students should learn related to global agricultural issues. Teachers mostly learned about global agriculture through activities that do not require travel, with watching television and professional development workshops as the most frequently reported activities. Few teachers had traveled outside the United States. Teacher beliefs and attitudes about what students should learn did vary based on selected international experiences, with teachers who had participated in international experiences having slightly stronger beliefs and more favorable attitudes. However, these differences had little practical significance.

Keywords: global agriculture; agriculture teachers; beliefs; attitudes

People around the world have become increasingly interconnected through the availability of lower cost transportation, communication, and the increase in computers (National Research Council, 2009; Schuh, 1989). As other nations have gained a foothold in the international market, the U.S. has lost economic power (Schuh, 1989). In order to remain competitive in a global marketplace, agriculture students, the future agricultural workforce, must understand the international system of politics, institutions, and economies, particularly agriculture economies, and cultures other than their own (Schuh, 1989).

As far back as 1989, Schuh pointed out that "most students will find themselves working for (or owning) farms and firms that export to…or that compete with…other countries" (p. 8). Globalization of agriculture continues to increase (National Research Council, 2009), and many employers are seeking employees with global perspectives (Acker, 1999; Harder et al., in press). Many agricultural problems have a global nature (National Research Council, 2009). The integration of international perspectives in the secondary agricultural education program can increase students' understanding and cultural awareness, and help them comprehend the magnitude of these global agricultural problems (Shoulders & Myers, 2010). The continued expansion of agriculture has led to a need for globalized curricula.

As far back as 1999, faculty have expressed a need for "teaching professional agricultural subjects from an international perspective" (Acker, 1999, p. 13). Teacher education programs

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have lagged behind higher education overall in terms of internationalization, which has led to teachers who may be unready to incorporate international issues (Zeichner, 2010). Acker specifically addressed the need for educators to see an issue from multiple perspectives and to build international issues into curriculum materials. In order for U.S. agriculture to maintain a strong presence in the global market, the curriculum used to educate future agriculture workers must be internationalized (National Research Council, 2009). Future agriculture workers may often be reached through youth agriculture organizations and agriculture classrooms, such as FFA and secondary agriculture classes.

Today's graduates must be prepared to work in a global economy (National Research Council, 2009). The AAAE National Research Agenda (Doerfert, 2011) called for a "sufficient scientific and professional workforce that addresses the challenges of the 21st century" (p. 9). Specifically, the need for a diverse workforce that meets the higher capacity demands of a global economy and understands agriculture in a global context is identified (Doerfert, 2011). Not all high school agriculture students will go on to college, so incorporating international perspectives in the high school curriculum can broaden their perspectives as they seek employment. Agricultural education has a responsibility to prepare globally aware students for employment in the workforce. One of the first steps to preparing these students is examining factors that influence the globalization of educational activities. As noted by Darling-Hammond and Bransford (2005), teachers are key in developing and delivering any educational activity. This study assessed the beliefs and attitudes of agricultural educators towards global agriculture issues. Ultimately, this information could be used to develop teachers capable and willing to increase the amount of globalized instruction that students receive.

Theoretical Framework

Ajzen's (1991) Theory of Planned Behavior was used to frame this study. According to the Theory of Planned Behavior, three main elements affect a person's intention to perform a behavior (Ajzen, 1991). Attitude towards the behavior encompasses a person's perceptions of the behavior and his/her perceptions of the consequences of the behavior (Ajzen, 1991). Subjective norm describes the person's perception of other's beliefs that he/she should or should not perform the behavior (Ajzen, 1991). Perceived behavioral control is the person's perceived ease or difficulty of performing the behavior (Ajzen, 1991). The combination of these three elements leads to a person's intention to perform the behavior, and to the behavior itself (Ajzen, 1991).

Literature Review

Students at secondary and postsecondary levels have shown a lack of knowledge of international agricultural issues. Forty-seven percent of high school agriculture students on an FFA study abroad program had received less than one week of instruction on international agriculture, while another 26% had received no instruction (Connors, 2004). This was despite the fact that in 1994, 58% of agriculture teachers in 12 Midwestern states reported teaching international issues in agriculture (Ibezim & McCracken, 1994).

Teacher beliefs have not been extensively studied, but what research exists has shown beliefs impact the implementation of curriculum. The role of teacher beliefs on curriculum implementation was specifically explored in Cronin-Jones' (1991) case study of two science teachers. A grounded theory qualitative technique was used to study two middle school science teachers' implementation of a 20-lesson curriculum over a six-week period. The teachers worked at the same school and thus, had a similar teaching environment (Cronin-Jones, 1991). The first teacher's beliefs about student learning, abilities, and discipline hindered implementation of the curriculum in the way in which it was designed to be implemented (Cronin-Jones, 1991). From this study, four categories of beliefs that affect curriculum implementation were identified: how

students learn, the role of the teacher in the classroom, student ability levels, and importance of content topics (Cronin-Jones, 1991). Cronin-Jones found teacher beliefs played a large role in implementation and strategy choice when teaching a curriculum.

A study of 50 teachers who participated in an eight to 15 week overseas student teaching experience demonstrated the impact that international experience can have (Cushner & Mahon, 2002). Student teachers reported their beliefs about the world changed, and they developed more empathy and trust (Cushner & Mahon, 2002). Additionally, several students mentioned using their international experiences in their teaching, in order to help students gain a multicultural and global perspective (Cushner & Mahon, 2002). Overall, the students became more global-minded and open to diversity, characteristics that may lead to more globally-minded teaching practices (Cushner & Mahon, 2002).

Selected demographic characteristics have been shown to have an effect on other factors, such as attitudes, beliefs, and level of integration of global agricultural issues. Positive relationships have been found between level of global integration and teacher age, level of formal education, and years teaching (Ibezim & McCracken, 1994). Hossain, Moore, and Elliot, (1995) also found age to be related to attitudes, with younger teachers having more favorable attitudes about internationalization than older teachers. Also positively associated with attitudes were the factors of memberships in professional organizations, cosmopolitanism, reading of *The Agricultural Education Magazine*, and participation in national seminars (Hossain et al., 1995). Some evidence exists that females are more likely to be world-minded than males, but a consensus has not been reached in the literature (Schuerholz-Lehr, 2007). Zhai and Scheer (2004) found female students were more globally aware and a more positive attitude towards cultural diversity.

The existing literature presents a limited understanding of the beliefs and attitudes of secondary agriculture teachers about global agricultural issues. Previous studies used convenience samples or only looked at a rather small geographic region of the country. This study expands our understanding of this topic through a national study using a sample that is generalizable to all secondary agriculture teachers in the U.S. The results presented in this study will lay the groundwork for future projects focused on globalizing secondary agricultural education programs.

Purpose and Objectives

The purpose of this study was to explore the attitudes and beliefs of secondary agriculture teachers regarding global agricultural issues. The objectives of the study were to:

1. Describe the personal beliefs of teachers about global agricultural issues.
2. Describe teacher attitudes related to what students should learn about global agricultural issues.
3. Describe how teachers perceive they learn about global agricultural issues.
4. Describe the past international experiences of teachers.
5. Determine if beliefs and attitudes vary based on selected international experiences of teachers.

Methods and Procedures

Research Design, Sample, and Data Collection

This study was a non-experimental quantitative design utilizing descriptive survey methodology. The population of interest was all secondary agriculture teachers in the U.S. In order to contact agriculture teachers, the 2012 Agricultural Careers Network database directory was obtained from the National FFA Organization (2012). The advisor contact list was obtained

at the end of August 2012, and listed about 11,000 advisors. A simple random sample was used in order to minimize researcher bias and reduce the likelihood that the sample was not representative (Ary, Jacobs, & Sorenson, 2010). A sample of 2,000 agriculture teachers was taken due to the desired response number of 385 and hypothesized response rates of 25% based on prior studies (Ibezim & McCracken, 1994; Israel, 1992; Shoulders, 2012). Isreal (1992) noted that published sample size tables "reflect the number of obtained responses and not necessarily the number of surveys mailed or interviews planned" (p. 3). He went further to indicate that researchers often increase the number of people contacted to "compensate for nonresponse" (p. 3). Bartlett, Kotrlik, and Higgins (2010) reported that oversampling is often used in survey research to compensate for non-response. They suggested using previous research studies with the population as a guide in determining how much to oversample. This approach was used in the current study. Ultimately, the accessible sample size was reduced to 1,756 due to invalid email addresses and people leaving the profession.

Data collection followed the Tailored Design Method (Dillman, Smyth, & Christian, 2009). Pre-notice emails went out in September 2012 from the lead researcher's university email address. All other email correspondence was through the internal mailing system in Qualtrics. In total, participants received up to five email contacts encouraging participation. Data collection ended in November 2012.

Of the 1,756 teachers contacted, 429 provided some data and 417 completed the survey. To address non-response bias, random samples of non-respondents were first contacted by email and asked to complete the survey online, in a Word document, or through a phone interview. Of the 1,057 agriculture teachers who did not respond, a total of 421 different agriculture teachers were contacted through email, eliciting no additional responses. Since the email follow up to non-respondents was not effective, a random sample of non-respondents from each group was contacted by phone with a request to complete the survey over the phone at that time, online, or to schedule a time to take the survey later. Forty-two agriculture teachers were contacted by phone, eliciting seven total responses. A total of 417 usable responses were collected from agriculture teachers, resulting in a 23.7% response rate. Since follow up contacts did not yield enough responses to make a comparison, early and late respondents were compared to determine if there were any significant differences between the groups (Lindner, Murphy, & Briers, 2001). Late respondents were identified as those who replied after the November 5th follow-up email. No significant differences were found between early and late respondents in beliefs, attitudes, experiences, or demographic variables. Thus respondents were deemed representative of the target population.

A summary of teacher characteristics for respondents is presented in Table 1. Of these respondents, 242 (58.3%) were male, and 174 (41.7%) were female. Respondents had an average of 14.29 (SD = 10.36) years of experience, with a range of 1 to 49 years. The majority of respondents indicated they did the majority of their work in a rural area (n = 328, 78.7%), followed by suburban (n = 68, 16.3), and urban (n = 20, 4.8%). Of the respondents, the overwhelming majority was of European/Caucasian descent (n = 393, 94.2%).

Table 1

Frequencies and Percentages of Demographic Characteristics for Respondents

	f	%
Gender		
Male	242	58.3
Female	174	41.7
Years of Experience (*M* = 14.28, *SD* = 10.36)		
1-5	112	26.9
6-10	66	15.8
11-15	75	18.0
16-20	48	11.5
21-25	31	7.4
26-30	47	11.3
31-35	31	7.4
36+	4	1.0
Area in which participant works		
Rural	328	78.7
Suburban	68	16.3
Urban	20	4.8
Family Ancestry		
European	393	94.2
African	17	4.1
Native American	12	2.9
Mexican/Latin American	4	1.0
Asian	4	1.0
Pacific Islander	3	0.7
Puerto Rican	2	0.5
Other Caribbean ancestry	1	0.2
Arabic	0	0

Instrumentation

This study was part of a larger study investigating agricultural education teachers' and 4-H agents' knowledge of and perceptions about international agriculture. Data were collected using a modified version of the *International Agricultural Awareness and Understanding Survey* (Wingenbach et al., 2003). A panel of four researchers in agricultural and extension education reviewed the modified instrument to establish face and content validity. The instrument was also pilot tested with preservice teachers after modification. The instrumentation contained five sections: knowledge, beliefs, attitudes, past international experiences, and demographics. Only the attitudes, beliefs, and demographic items were used in this study. The attitudes and beliefs sections used a 6 point Likert-type scale as follows: 1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = slightly agree, 5 = agree, 6 = strongly agree. The reliability of the instrument was assessed *post hoc*. The scale used to assess attitudes about what students should learn produced an alpha of .95 and the scale used to teacher personal beliefs about global agriculture had an alpha of .86.

Data Analysis

Data for Objectives 1 through 4 were analyzed using descriptive statistics, including means, standard deviations, and frequencies. Data for Objective 5 was analyzed using the ANOVA procedure with partial Eta squared ($\eta_p 2$) as a measure of effect size. All significance tests used an alpha level of .05.

Findings

Objective 1: Describe the personal beliefs of teachers about global agricultural issues. Overall teachers had positive beliefs about global agriculture. The scale mean was 5.00 (*SD* = .58). Over half the teachers strongly agreed or agreed with all 10 belief statements. The most agreed upon (either strongly agree or agree) beliefs were: *international agriculture involves more than farming* (*n* = 379, 90.9%), *global food production allows me to eat a variety of products all year* (*n* = 354, 84.9%), and *global agriculture is different from one country to another* (*n* = 346, 83.0%). The lowest percentages of teachers agreed with the statements: *the U.S. should actively help other countries develop their agricultural industries* (*n* = 269, 64.5%), *in times of famine, the U.S. should help other countries with food aid* (*n* = 254, 60.9%), and *competition between producers worldwide keeps food prices low in my grocery store* (*n* = 227, 54.4%). Complete results are presented in Table 2.

Table 2

Teacher Beliefs About Global Agricultural Issues

	Frequency					
Belief Statement	1	2	3	4	5	6
International agriculture involves more than farming	1	1	0	31	156	223
Global food production allows me to eat a variety of products all year	1	3	6	48	177	177
Global agriculture is different from one country to another	2	5	10	49	185	161
Natural disasters affect the price of food in my local grocery store	0	4	5	59	166	178
Understanding other cultures helps U.S. producers market their products abroad	0	1	9	89	212	102
Understanding global politics helps U.S. producers market their products abroad	0	4	8	100	201	100
U.S. agricultural products are superior in quality to products from other countries	2	8	28	103	159	113
The U.S. should actively help other countries develop their agricultural industries	1	3	19	120	168	101
In times of famine, the U.S. should help other countries with food aid	2	4	23	130	167	87
Competition between producers worldwide keeps food prices low in my grocery store	2	13	44	127	146	81
					Scale Mean = 5.00; *SD* = .58	
					Scale Alpha = .86	

Note. 1 = *strongly disagree*, 2 = *disagree*, 3 = *slightly disagree*, 4 = *slightly agree*, 5 = *agree*, 6 = *strongly agree*.

Objective 2: Describe teacher attitudes related to what students should learn about global agricultural issues. Teachers had favorable attitudes regarding students learning about global agricultural issues (M = 5.06, SD = .87). Teachers strongly agreed or agreed with all 9 statements. Teachers most agreed students should learn more about: *agriculture and its importance to the world economy* (n = 367, 88.0%), *their state's agricultural industry and its connections to world trade* (n = 363, 87.1%), *how world agriculture affects food prices in the local grocery store* (n = 355, 85.1%), and *how world events affect local agriculture in their community* (n = 355, 85.1%). The lowest percentages of teachers agreed students should learn more about: *other countries' markets for U.S. agricultural products* (n = 302, 72.4%), *the differences between developed and developing countries* (n = 284, 68.1%), and *the cultures of other countries* (n = 228, 54.7%). Complete results are presented in Table 3.

Table 3

Teacher Attitudes About What Students Should Learn Related to Global Agricultural Issues

	Frequency					
Students should learn more about…	1	2	3	4	5	6
agriculture and its importance to the world economy	10	6	4	28	125	242
their state's agricultural industry and its connections to world trade	8	7	5	32	153	210
how world agriculture affects food prices in the local grocery store	9	5	7	39	153	202
how world events affect local agriculture in their community	10	5	6	39	167	188
agricultural products that their home state sells to other countries	10	5	5	44	158	193
the agricultural products from other countries that are consumed in their state	9	6	10	69	169	152
other countries' markets for U.S. agricultural products	8	6	10	88	183	119
the differences between developed and developing countries	9	6	19	97	191	93
the cultures of other countries	11	7	35	134	153	75
					Scale Mean = 5.06; SD = .87;	
					Scale Alpha = .95	

Note. 1 = *strongly disagree*, 2 = *disagree*, 3 = *slightly disagree*, 4 = *slightly agree*, 5 = *agree*, 6 = *strongly agree*.

Objective 3: Describe how teachers perceive they learn about global agricultural issues. Teachers were also asked to respond to a series of statements about how they learn about international agriculture (see Table 4). Based on the frequency of *agree* and *strongly agree* responses, teachers most agreed with the statements *I learn about global agricultural issues from watching selected television programs* (n = 226, 54.2%) and *I learn about global agricultural issues from professional development* (n = 213, 51.1%). These two activities were the only ones with which over 50% of the teachers agreed or strongly agreed. Teachers least agreed with the statements *I learn about global agricultural issues from taking vacations in other countries* (n = 141, 33.8%) and *I learn about global agricultural issues from listening to selected radio programs* (n = 140, 33.6%).

Table 4

Teacher Perceptions About How They Learn About Global Agricultural Issues

I learn about global agricultural issues from …	Frequency					
	1	2	3	4	5	6
watching selected television programs	10	26	27	126	182	44
professional development	20	28	43	109	147	66
my college classes	18	34	40	128	137	56
attending events such as fairs or shows	14	43	58	140	124	35
participating in study abroad programs	61	81	50	71	82	66
taking vacations in other countries	61	70	43	96	97	44
listening to selected radio programs	22	68	57	126	113	27
				Scale Mean = 3.97; *SD* = .90		
					Scale Alpha = .77	

Note. 1 = *strongly disagree*, 2 = *disagree*, 3 = *slightly disagree*, 4 = *slightly agree*, 5 = *agree*, 6 = *strongly agree*.

Objective 4: Describe the past international experiences of teachers. Teachers were asked to indicate whether or not they had a variety of international experiences. The most teachers (*n* = 236, 56.6%) answered yes to *integrate global examples or case studies in classes you teach*. This was the only activity completed by over half the teachers. The fewest teachers (*n* = 18, 4.3%) answered yes to *lived outside the U.S. for a long duration for professional reasons (> 1 year)*. Complete results are presented in Table 5.

Table 5

Past International Experiences of Agriculture Teachers

Experience	*f*	%
Integrate global examples or case studies in classes you teach	236	56.6
Traveled internationally for personal reasons (i.e. vacation, etc.)	198	47.5
Participated in professional development workshop(s) with a global focus	174	41.7
Took a globally focused course as a student	136	32.6
Participated in a short term study abroad experience as a student (1 to 3 weeks)	67	16.1
Participated in a long term study abroad experience as a student (> 3 weeks)	35	8.4
Lived outside the U.S. for a short duration for professional reasons (< 1 year)	33	7.9
Lived outside the U.S. for a short duration for personal reasons (< 1 year)	28	6.7
Lived outside the U.S. for a long duration for personal reasons (> 1 year)	21	5.0
Lived outside the U.S. for a long duration for professional reasons (> 1 year)	18	4.3

Objective 5: Determine if beliefs and attitudes vary based on selected international experiences of teachers. Because of the variety of past international experiences of teachers, the beliefs and attitudes of teachers were compared based on selected international experiences. Teacher personal beliefs about global agricultural issues did vary. Teachers who had *participated in professional development workshop(s) with a global focus* had stronger positive beliefs (*F* =

11.10, p = .00, η_p^2 = .03). If a teacher had *traveled internationally for personal reasons (i.e. vacation, etc.)*, it had no effect on their beliefs (F = .23, p = .63, η_p^2 = .00) (see Table 6).

Table 6

Differences in Teacher Beliefs About Global Agricultural Issues Based on Selected International Experiences

Experience		*f*	*M*	*SD*	*F*	*p*	η_p^2
Participated in professional development workshop(s) with a global focus	Yes	172	5.11	.56	11.10	.00	.03
	No	237	4.92	.58			
Traveled internationally for personal reasons (i.e. vacation, etc.)	Yes	198	5.01	.56	.23	.63	.00
	No	211	4.99	.60			

Teacher attitudes about what students should learn did not change if teachers had *participated in professional development workshop(s) with a global focus* (F = 2.61, p = .11, η_p^2 = .01). In contrast, attitudes towards what students should learn were more favorable if they had *traveled internationally for personal reasons (i.e. vacation, etc.)* (F = 5.00, p = .03, η_p^2 = .01). The effects of these two international experiences were very small (see Table 7).

Table 7

Differences in Teacher Attitudes About What Students Should Learn Based on Selected International Experiences

Experience		*f*	M	SD	F	*p*	η_p^2
Participated in professional development workshop(s) with a global focus	Yes	174	5.15	.82	2.61	.11	.01
	No	238	5.01	.89			
Traveled internationally for personal reasons (i.e. vacation, etc.)	Yes	197	5.17	.74	5.00	.03	.01
	No	215	4.98	.95			

Teachers were asked about several experiences that occurred while they were students. To try and minimize the extent that the amount of time since the experience had on the potential impacts of these experiences, only teachers with 5 or fewer years of experience were used in the analysis. Personal beliefs of the teacher about global agricultural issues did not change if they had *participated in a short-term study abroad experience as a student (1 to 3 weeks)* (F = .50, p = .48, η_p^2 = .01) or *participated in a long-term study abroad experience as a student (> 3 weeks)* (F = .07, p = .79, η_p^2 = .00). In contrast, teachers had more positive beliefs if they *took a globally focused course as a student* (F = 4.45, p = .04, η_p^2 = .04). However, the effect size for all these activities was very small (see Table 8).

Table 8

Differences in Early Career Teacher Beliefs About Global Agricultural Issues Based on Selected International Experiences

Experience		*f*	*M*	*SD*	*F*	*p*	η_p^2
Participated in a short term study abroad experience as a student (1 to 3 weeks)	Yes	29	5.07	.55	.50	.48	.01
	No	80	4.98	.54			
Participated in a long term study abroad experience as a student (> 3 weeks)	Yes	11	4.96	.47	.07	.79	.00
	No	89	5.01	.55			
Took a globally focused course as a student	Yes	46	5.13	.52	4.45	.04	.04
	No	63	4.91	.54			

Teacher attitudes about what students should learn were not changed if they *participated in a short term study abroad experience as a student (1 to 3 weeks)* ($F = .60$, $p = .44$, $\eta_p^2 = .01$), *participated in a long term study abroad experience as a student (> 3 weeks)* ($F = 1.83$, $p = .18$, $\eta_p^2 = .02$), or *took a globally focused course as a student* ($F = 2.07$, $p = .15$, $\eta_p^2 = .02$). All these experiences had very small effects on teacher attitudes (see Table 9).

Table 9

Differences in Early Career Teacher Attitudes About What Students Should Learn Based on Selected International Experiences

Experience		*f*	*M*	*SD*	*F*	*p*	η_p^2
Participated in a short term study abroad experience as a student (1 to 3 weeks)	Yes	30	5.23	.79	.60	.44	.01
	No	80	5.08	.97			
Participated in a long term study abroad experience as a student (> 3 weeks)	Yes	11	5.47	.52	1.83	.18	.02
	No	99	5.08	.95			
Took a globally focused course as a student	Yes	48	5.26	.82	2.07	.15	.02
	No	62	5.01	.99			

Conclusions, Discussion, and Recommendations

Agriculture teachers had positive personal beliefs about global agriculture. This conclusion is consistent with several prior studies. In a study at the collegiate level, Akpan and Martin (1996) found agricultural education professors nationwide believed international agricultural issues would become more important in the next 10 to 20 years and "the total college curriculum should reflect a respect for knowledge of the global community" (p. 66). Cronin-Jones (1991) found teacher beliefs and attitudes played a large role regarding curriculum implementation and strategy choice when teaching a curriculum. Ibezim and McCracken (1994) also found teacher attitudes had a positive relationship with integration of internationalized agriculture curricula.

The positive beliefs exhibited by teachers about global agriculture may be indicative of a better understanding of the global interconnectedness of the food system. As per Ajzen's (1991) theory, beliefs are a precursor for behavior. Positive beliefs from teachers indicate the conditions

may be favorable for teachers to more overtly integrate global issues into the courses they teach. Teacher educators and curriculum designers should capitalize on these favorable attitudes by more overtly addressing global issues.

Further research should be conducted to explore teacher beliefs on a deeper level. In-depth interviews would be very insightful. Additionally, as older teachers retire and new teachers enter the profession it would be beneficial to revisit this phenomenon to see if beliefs have changed.

Teachers had favorable attitudes about what students should learn related to global agricultural issues. The most agreed upon statement was *students should know more about agriculture and its importance to the world economy*. The findings of this study are consistent with the results of the study by Hossain et al. (1995) showing that Michigan agriscience teachers had positive attitudes towards internationalization of the curriculum. The importance of students learning about global agriculture has also been demonstrated at the collegiate level. Faculty at Iowa State University in the College of Agriculture believed internationalization was important (King & Martin, 1995).

Teachers generally believe it is important for students to learn about global agricultural issues. As noted earlier, this is another indicator that the timing may be right to capitalize on teacher beliefs (Ajzen, 1991) about the importance of global agriculture issues and provide them with a curriculum that is integrated with global examples. It may also be advisable to examine current curriculum frameworks to see how global agricultural issues fit with current concepts.

This study stops short of assessing what teachers are actually teaching or what teachers actually know. It would be helpful to conduct an analysis of teacher knowledge and for what is actually happening in classrooms to determine if teacher beliefs and attitudes are actually leading to a learning experience for students that provides both a domestic and global context for the concepts to be learned. It would also be insightful to explore student perceptions about what they would like to learn about related to global agricultural issues.

Teachers mostly learned about global agriculture through activities that do not require international travel, with watching television and professional development workshops as the most frequently reported activities. It seems obvious that teachers must first have knowledge of international agriculture themselves to be able to teach others, which Darling-Hammond and Bransford (2005) referred to as content knowledge. The results of this study revealed teachers learn about global agriculture in a variety of ways and are seeking to become more informed about international agriculture both in their academic/professional lives (professional development, college courses, study abroad) and their personal lives (e.g. vacations abroad, television viewing, radio listening).

It makes sense that teachers are primarily learning about global agricultural issues from activities that do not require an extensive amount of time or money. Teachers are busy people with demanding jobs and despite breaks in the work year (Christmas break, spring break, summer break, etc.) teachers are not travelling internationally. It is plausible the expense of travelling internationally is the limiting factor. It could imply that: (a) their attitudes about the value of doing so are not favorable enough to offset issues with perceived control, (b) they do not think others value it highly, or (c) some combination of both. Given that in-service teachers may not be able to invest much effort on activities that require a substantial amount of time and expense, like traveling internationally for professional development. These activities may be better targeted at preservice teachers. Teacher educators should examine their curricula to see how these types of experiences may be integrated. The handful of such activities that currently exist should be examined for possible replication at other institutions.

This study only asked teachers how they accessed information; it did not assess the effectiveness of different types of activities. It would be beneficial to explore this deeper and determine how the biggest gains can be made. Teachers reported watching television was as a common way they learn about global agricultural issues. It would be interesting to explore this

deeper to see the types of programs that teachers are watching. It would also be helpful to have teachers describe the types of professional development workshops that teachers are attending related to global agricultural issues. There could be the opportunity for teacher educators to facilitate targeted professional development on topics related to global agriculture.

Few teachers had international experiences involving travel outside the U.S. The most common "international" experience for teachers was *integrate global examples or case studies in classes you teach*, while the least common was *lived outside the US for a long duration for professional reasons (> 1 year)*. This is consistent with the statistics from the Institute of International Education (2011) that showed only 1.3% of agriculture students study abroad, which could explain some of the low participation rates. Sammons and Martin (1996) also found few Iowa State University agricultural major undergraduates had participated in international experiences other than foreign language classes. Mamontova and Bruening (2005) found Penn State undergraduates were least interested in participating in study abroad when given a list of international experiences, and that despite the value, many students had not participated in international activities. These results are also consistent with findings by Wingenbach et al. (2003) that of all types of international experiences, the fewest number of agricultural undergraduate students had participated in an International Farm Youth Exchange or work experience.

The results of this study may suggest the *quality* of international experiences may be more important than the *quantity*. Though teachers had some international experiences, there is no way to measure the quality of the experiences had by participants. Teachers may feel their time is not well spent on the types of international experiences currently available to them. Teachers may also have a hard time finding time to take off in order to attend conferences or participate in other activities. Additionally, many school districts may discourage taking time off, especially for international experiences, which may be seen as less valuable.

It would be helpful to learn more about the specific types of experiences of teachers and to measure the actual outcomes of those experiences. It would also be insightful to look at the timing (preservice, early career teacher, experienced teacher, etc.) of those experiences and see how it impacts the outcomes for the teachers and ultimately the outcomes for students. It would also be interesting to explore how international travel for personal reasons impacts what and how teachers teach. Perhaps it would be helpful for teachers if there were resources available to help them gather relevant teaching examples while traveling abroad.

Teacher beliefs and attitudes about what students should learn did vary based on selected international experiences, with teachers who had participated having slightly stronger beliefs and more favorable attitudes. However, these differences had little practical significance. This would seem to be counter to experiential learning theory (Kolb, 1984; Roberts, 2006) and to existing research (Cushner & Mahon, 2002). However, nearly all of the teachers had strong beliefs and favorable attitudes. There may not have been enough variance in the data to find effects from the experiences.

A shortcoming of this study was that it failed to assess the specific details of the different types of experiences had by teachers, including the time passed since the teacher had any given experience. It would be very insightful to examine the outcomes of specific types of experiences for short-term, medium-term, and long-term impacts on both teachers and ultimately their students. Future research should look at this issue. As a part of this research, in-depth interviews with teachers would be very helpful to understand this phenomenon much better.

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