

Global Citizenship: Change in Agricultural Teacher Candidates from a High Impact Experience

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Abstract

Global citizenship is critical to the development of a globally ready 21st century workforce in food, fiber, and natural resources. The global citizenship model utilized in this study includes domains of social responsibility, global competency and global civic engagement. The knowledge, skills, and dispositions of educators are critical factors to the advancement and development of global citizenship in students. Two cohorts of pre-service agricultural teacher candidates occurring in two different programming years from two different agricultural teacher education institutions from different parts of the US were presented the opportunity to participate in a high impact experience through a program lasting a full academic year. We utilized an accepted Global Citizenship Scale modified for the agricultural context and collected data in a pre-post format. Both cohorts of pre-service agricultural teacher candidates increased their global citizenship overall and across all three domains from pre to post assessment after completing the program. Recommendations include continuing and expanding domestic global learning opportunities for teachers to gain necessary global knowledge and skills and further research on differences in gains from domestic to international experiences.

Introduction

Through the last three decades agricultural trade and diffusion of innovation have become increasingly dependent on international and multinational collaboration (Boix-Mansilla & Jackson, 2011). Experts believe that as agriculture becomes more globally connected, the need for more globally competent workers will continue to increase (Boix-Mansilla & Jackson, 2011; Goecker et al., 2010; Majewska, 2022;

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Rensink,2020). A major component of working in a global setting is the importance of establishing a perspective as not just a citizen of one specific country or region, but as a global citizen (Guo-Brennan, 2014; Reimers, 2009; Zhao, 2009). Global citizenship brings a normative environment where people can better connect with the multicultural groups around them, working both inside and outside of their ingroup (Reysen & Katzarska-Miller, 2013) and developing global citizenship is a priority that is documented across disciplines and countries (Nygren et al., 2020; Van Rompay-Bartels & Tuninga, 2023) with a teacher education and teacher professional development identified as a critical element to systematically improving global citizenship (Saperstein, 2020; Akar et al., 2022). The result of global citizenship is a mindset in which individuals prioritize awareness, caring, and embrace cultural diversity while promoting social justice and sustainability with a sense of responsibility to act (Reysen & Katzarska-Miller, 2013; Amna et al., 2022).

The characteristics of a global citizen include social responsibility, global competence, and global civic engagement (Morais & Ogden, 2011). Social responsibility can be characterized by a respect for diverse opinions, the ability to assess social issues, awareness of injustice and inequality around the world, and a commitment to addressing local and global issues of concern as measured. Global competence is the ability to demonstrate an array of intercultural communication skills and successfully in intercultural encounters and leveraging knowledge by interacting, communicating, and working effectively outside one's environment (Morais & Ogden, 2010). Global civic engagement involves participating in civic groups, volunteering for and with global organizations, shaping a global political voice through public knowledge and experience, and promoting a worldwide agenda through local actions (Morais & Ogden, 2010).

Many experts suggest that developing global citizenship should begin in early years as students learn about social skills within a school setting (Celume & Maoulida 2022; Asia Society, 2018; Zhao, 2010). While this may be an important goal, it is one many educators feel less prepared to tackle (Asia Society, 2018; Guo-Brennan, 2014; Heinert & Roberts, 2016). According to a UNESCO survey in 2021, one in four teachers globally do not feel prepared to teach their students about sustainable development and global citizenship. Educators who are prepared to provide global education to their students increase the likelihood of students being capable in a global workforce (Cheng & Huang, 2023). Universities in the United States and abroad are challenged with training future leaders and professionals to be active global citizens once they enter their careers to meet demands of global citizens who are prepared to work in their ever-changing communities (Heinert & Roberts, 2016; Tichnor-Wagner et al., 2016). As they enter the profession, pre-service teachers will need to be prepared to provide global competence education to their students (Ramos et al., 2021).

As universities work to develop programming which is suited to produce a well-rounded and prepared workforce, many have embraced the concept of additional learning activities to extend knowledge, expand opportunity, and curate skills in students beyond content knowledge (Kuh, 2008). High Impact Experiences (HIEs) are a broad category of experiential learning opportunities that involve practical skills appliance through avenues outside of traditional classroom settings (Kuh, 2008). Researchers found correlations between participation in HIEs and several success indicators including an increase in student satisfaction with their educational experience (Miller et al., 2015), increased academic achievement (Kuh, 2008), and increased earning potential at early career stages (Wolniak & Engberg, 2019). Many of the advantages to students from participation in HIEs come in the form of gains in self-efficacy, resiliency, and other noncognitive skills (Kuh et al., 2013). Giving students the opportunity to develop skills outside of traditional classroom learning settings is paramount to developing student success in careers (Khine & Areepattamannil, 2016). Participating in high impact experiences has the potential to assist students in becoming "effective agents for their own lifelong learning and personal development" (Chickering, 1994, p 50). Students who participate in HIEs are more likely to develop higher levels of social literacy than their classmates who do not participate in HIEs. (Riehle & Weiner, 2013). Students who exhibit social literacy are familiar with and can work effectively with people of other cultures and languages (Crosby, 2019).

Participation in learning outside of the classroom has an increased impact for students who come from underrepresented populations (O'Donnell et al., 2015; Hill & Karlin, 2019). Affluent young adults are more likely to travel, seek opportunities away from home, and participate in activities that are related to experiencing other cultures, people, and places compared to those who come from lower socio-economic backgrounds (Wofford, 2022). The benefits of providing opportunities for cultural expansion are even more important for students who are from rural areas and those who are from economically disadvantaged backgrounds actively experiencing a broadening of their horizons through non-educational avenues (Wagner, 2010).

The need to incorporate global agricultural concepts into curriculum creates a need for agricultural education graduates who enter the profession to be prepared with the necessary skill and knowledge to facilitate secondary student learning on a global scale (Guo-Brennan, 2014; Heinert & Roberts, 2016; Longview Foundation, 2008; Zeichner, 2010). Agricultural educators entering the classroom have a better chance of providing their students with global citizenship if they are globally competent and exposed to multiculturalism (Asia Society 2018; Heinert & Roberts, 2016). Many in-service agricultural educators do not feel capable of incorporating global content such as the United Nations Sustainable Development Goals (UNSDGs) into their classrooms and note a desire for training in this field of study (Letot, 2023). Many pre-service agricultural educators have opportunities to take courses in international agriculture and participate in international study abroad opportunities at various universities (Byker & Putnam, 2019), but few programs exist to explicitly prepare pre-service teachers to teach lessons which are globally based and focused on helping students develop global citizenship (Kerkhoff & Cloud, 2020; Wagner, 2010).

For both in-service and pre-service teachers there is a need to develop and promote professional development of the components of global citizenship to ensure educators are competent to teach globalized curricula (Heinert, Conner & Robert, 2013). Existing research highlights how beliefs impact the implementation of curriculum (Hurst, 2015). For students to attain global competency and citizenship, it is important for teachers to appreciate the relevance of global perspectives of the subject matter that they are teaching (Magato, 2017).

The Global Teach Ag Network, a network of over thirty partner organizations, strives to bridge these gaps for both pre-service and in-service agriculture, food, and natural resource educators across the world. In conjunction with the larger program, pre-service educator students from two institutions had the opportunity to participate in a year-long global learning experience. The Global Orientation to Agricultural Learning (GOALs) program allowed globally competent educators to work toward objectives specifically designed to help increase pre-service teachers' global citizenship through year-long professional development. An important component of the GOALs program is instruction specifically designed to help improve the global citizenship of pre-service agricultural teacher candidates through HIE practices. Examining HIE practices helps provides valuable insight for the profession, aiding in the preparation of GOALs participants for the workforce, in alignment with the American Association of Agricultural Educators International Development and Diversity, Equity, and Inclusion Research Values (AAAE, 2023).

Purpose and Objectives

The goal of this portion of a larger study was to examine differences in global citizenship from beginning of program-to-program completion for pre-service teachers engaged in the first two cohorts of the Global Orientation to Agricultural Learning (GOALs) program. There were three research objectives (RO) for this portion of the study.

1. Describe the initial global citizenship of pre-service teacher candidates engaged in a year-long domestic experiential learning cohort surrounding global agricultural education.
2. Describe the post-experience global citizenship of pre-service teachers engaged in a year-long domestic experiential learning cohort surrounding global agricultural education.

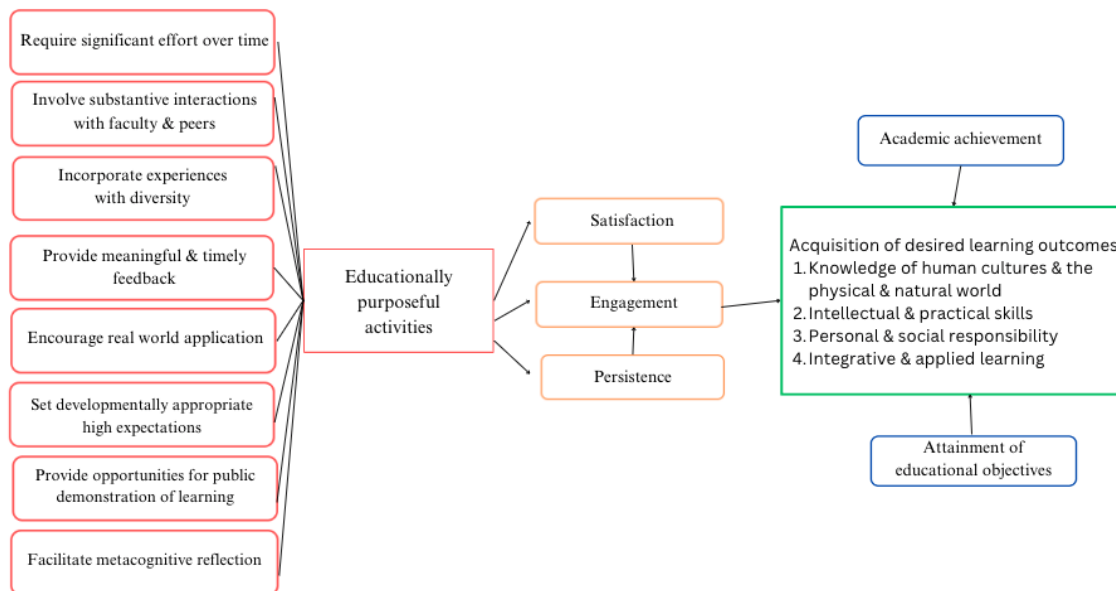
3. Examine differences in global citizenship for two cohorts of pre-service teachers engaged in year-long programming surrounding global agricultural education from the beginning to the end of the immersion.

Conceptual Framework

We grounded this study in a theoretical model for HIE involvement as proposed by Buck (2020) where the components of HIEs can impact student satisfaction, engagement, and persistence which can contribute to student acquisition of the essential skills as outlined by the American Association of Colleges and Universities (AAC&U). This interaction is shown in Figure 1.

Figure 1

Conceptual framework for the interaction of HIE to AAC&U desired learning outcomes (Buck, 2020)

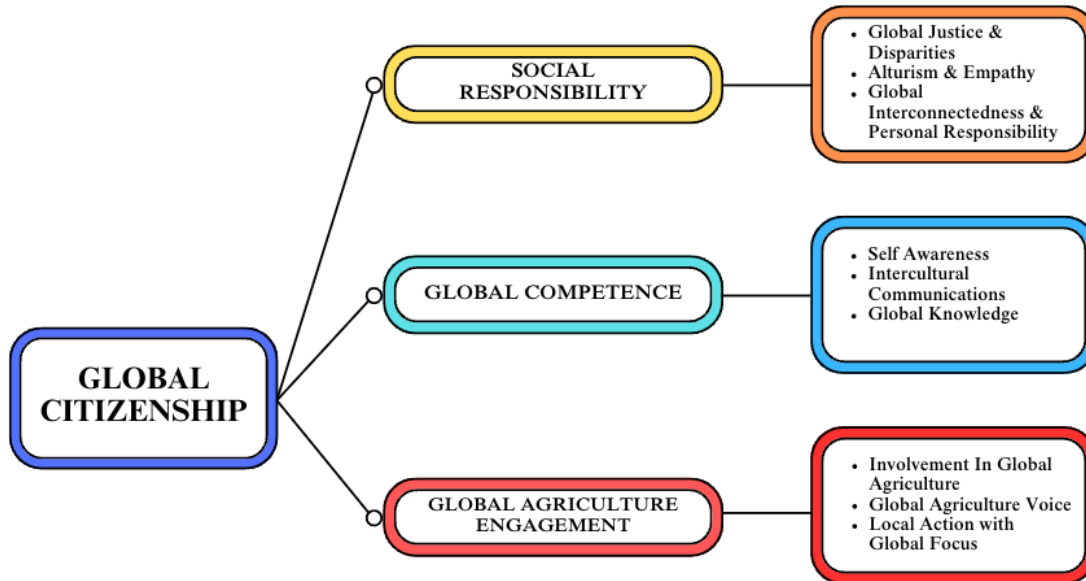


Building purposeful educational activities allows students to grow and develop through HIEs. Wolf-Wendel, et al., (2009) noted that while many post-secondary institutions claim to implement HIEs for students, few are following the full recommendations as set forth by Kuh (2008). We designed this study to allow us to examine the impact of a HIE which intentionally incorporated all eight of the components on student personal development including their knowledge of human cultures and the physical and natural world, intellectual and practical skills, personal and social responsibility, and integrative and applied learning.

To describe the educational outcomes of this program, we employed a modified version of the global competence structure (Morais & Ogden, 2010). Due to our context specific focus on agriculture, we modified the construct of “global civic engagement” to “global agriculture engagement” which provided a more tailored reflection on the role of agriculture in a global context. The resulting conceptual model includes the theory of planned behavior as the output of were integrated for the final conceptual model. The resulting conceptual model of educational outcomes is shown in Figure 2.

Figure 2

Identified Educational Outcomes Bases on the Global Citizenship Model Adapted from Morais and Ogden (2010)



Methods

This study was conducted as a descriptive pre-post survey. Researchers note that survey research is in order when the objectives require respondents to share personal thoughts, beliefs, or attitudes toward a subject and their viewpoints can be self-identified (Creswell, 2012). A pre-post-test design is appropriate for this study as it allows for the measurement of changes in global citizenship among pre-service teachers from the beginning to the end of the program. This design aligns with the study's goal to examine differences over time, providing a clear comparison of initial and post-experience global citizenship levels.

Population

The population of this study was a census of all participants who completed the GOALS program for the 2021-22 and 2022-23 cohorts ($N = 29$). Participation in the program was open for students with sophomore or junior standing at the time of participation, and preference was given to students who indicated a strong desire to pursue a career as an agricultural educator. Participants were selected based on an application process which considered their desire to examine international agriculture, commitment to program components, and their desire to use knowledge to help future students. It is important to note that the original population over two years was intended at $N = 32$ participants, but three participants did not complete the spring immersion, one due to a failure to meet GPA requirements, and two due to a change in enrollment status. Data are included for only those students who completed the entire program. Subject characteristics are included in Table 1.

Among the respondents, 13.8 ($n = 4$) percent were nineteen years of age, 48.3 ($n = 14$) percent were 20 years of age, 34.5 ($n = 10$) percent were twenty-one years of age and 3.4 ($n = 1$) percent were twenty-two years of age. Seventy-five point nine percent ($n = 22$) of the participants identified as female, whereas 24.1 ($n = 7$) percent identified as male. The breakdown of students based on their institution was almost evenly split, with 51.7 ($n = 15$) percent of participants from Penn State University and 48.3 ($n = 14$) percent of participants from University of Idaho. Most of the respondents ($n = 25$, 86.2%) indicated agricultural education as their academic major was agricultural education. The remaining participants ($n = 4$, 13.8%)

identified their academic major as “other”, when examined further, these students indicated animal science or pre veterinary medicine as their major. In examining respondent background, of the respondents, 58.6 ($n = 17$) percent identified coming from a rural hometown, 24.1 ($n = 7$) percent identified a suburban hometown and 17.2 ($n = 5$) percent identified as coming from an urban hometown.

Table 1

Agricultural Teacher Candidates in the Study (N = 29)

Demographic Variables	Cohort 1 (21-22)		Cohort 2 (22-23)		Overall	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Age						
19	2	16.7	2	11.8	4	13.8
20	6	50.0	8	47.1	14	48.3
21	4	33.3	6	35.3	10	34.5
22	--	--	1	8.3	1	3.4
Gender						
Male	2	16.7	5	29.4	7	24.1
Female	10	83.3	12	70.6	22	75.9
Program						
Penn State University	7	58.3	8	47.1	15	51.7
University of Idaho	5	41.7	9	52.9	14	48.3
Major						
Agricultural Education	10	83.3	15	88.2	25	86.2
Other	2	16.7	2	11.8	4	13.8
Hometown Classification						
Rural	8	66.7	9	52.9	17	58.6
Suburban	2	16.7	5	29.4	7	24.1
Urban	2	16.7	3	17.6	5	17.2

Description of High Impact Education Practice

During the year-long experience, participants engaged with industry professionals, policymakers, and other educators from around the globe. The complete experience included two semesters of instruction along with two domestic immersions designed to help stimulate global competence and citizenship: one in the fall and one in the spring. The program began in 2021, and two cohorts of undergraduate students have completed it since. Since the inception of GOALs, two undergraduate cohorts have completed the program. The first domestic immersion each year included student participation in the World Food Prize Foundation Borlaug Dialogues in Des Moines, Iowa. The fall course was designed for the participants to begin to inventory their global citizenship to create lessons for future students in food security and global citizenship. The spring course preceded the spring immersion, and the second domestic immersion allowed participants to travel across the country to domestic agricultural education programs in secondary schools to teach week-long global citizenship and food security units to high school students.

Instrumentation

The instrument used in this study is a modified version of the Global Citizenship Scale (Morais & Ogden, 2011). The first section of the instrument included demographic questions including names and information on previous international experiences. The second section of the instrument included 25 Likert-type questions which allowed respondents to share their attitudes toward global citizenship statements. The responses to the questions were out of 1- “Strongly Disagree” to 5- “Strongly Agree” Example statements for each of the domains is shown in Table 2.

Table 2

Example statements in each global citizenship domain

Domain	Example Statements
Social Responsibility	<p>“I think that people around the world get the rewards and punishments they deserve.”</p> <p>“I think that many people around the world are poor because they do not work hard enough.”</p>
Global Competence	<p>“I know several ways in which I can make a difference on some of this world’s most worrisome problems.”</p> <p>“I unconsciously adapt my behavior and mannerisms when I am interacting with people of other cultures.”</p>
Global Agricultural Engagement*	<p>“Over the next 6 months, I will educate others about global agriculture and how it impacts us locally.”</p> <p>“I will boycott brands or products that are known to harm marginalized global people and places.”</p>

Note: * modified global civic engagement

Respondents rated their level of agreement on a scale from 1 (strongly disagree) to 5 (strongly agree). The items included statements designed to measure respondent attitudes toward social responsibility, global competence, and global agricultural engagement.

Reliability for the Global Citizenship Scale was previously established by Morias and Ogden (2010) in distributions with adult populations, yielding a Cronbach’s of alpha $\alpha = .92$ for the entire instrument and Cronbach’s alpha levels from $\alpha = .89$ to $\alpha = .94$ for the embedded constructs. Previous distributions in adolescent populations yielded Cronbach’s alpha levels from $\alpha = .76$ to $\alpha = .88$. In this study, we calculated a post hoc measure of reliability and found Cronbach’s alpha of $\alpha = .89$ across all distributions, and levels ranging from $\alpha = .79$ to $\alpha = .92$ for individual constructs across the four distributions. We employed an added reliability measure by calculating a Spearman-Brown split-half reliability coefficient to represent the internal consistency between the first and second half of the modified scale. The calculation revealed a Spearman-Brown coefficient of .91 which indicated the overall reliability of item intercorrelation on the scale.

Data Collection

Data were collected in a pre-post structure for two cohorts of the program with a total of four data collection points. The GOALs program was designed to introduce students to concepts related to global

food security, global agricultural production, and issues surrounding food production on a global scale. Both cohorts of the program were facilitated through the same faculty members and included nearly identical instruction, high-impact experiences and assessments.

The instrument was distributed through the learning management system for the course and respondents were assigned completion prior to the first course session in the fall and at the final course session in the spring. This cross-sectional distribution allowed data collection prior to exposure of any course components for the fall distribution in each cohort and following all course components for the spring semester in each cohort. The course assignment included a link to an online Qualtrics survey. Students who did not complete the instrument prior to the first-class session were asked to complete the session before they entered the class.

Data Analysis

Data were downloaded from the Qualtrics system and formatted for analysis using Microsoft Excel, then analyzed using IBM SPSS v 23. Analysis included calculating descriptive information for the constructs and holistic score on the global citizenship scale for each of the cohorts and overall. Descriptive data were also examined based on demographic variables for the components of the global citizenship scale.

To determine differences from pretest to posttest across the cohort experience, paired samples *t*-tests were conducted. Cohen's *d* was chosen as the most appropriate effect size calculation to complement the paired samples *t*-test (Cohen, 1977).

Findings

Examining the initial global citizenship score of respondents allowed us to gather a baseline knowledge in students prior to their participation in the program. Respondents across both cohorts indicated a mean global citizenship score of $M = 3.02(SD = 0.23)$. For constructs within the global citizenship scale, respondents reported scores of $M = 2.56(SD = 0.40)$ for social responsibility, $M = 3.06(SD = 0.23)$ for global competence, and $M = 3.47(SD = 0.56)$ for global agricultural engagement. Results for pretests are shown for both cohorts in Table 3.

Table 3

Global Citizenship Scale Pretest Scores by Cohort

	Cohort 1 (n = 12)				Cohort 2 (n = 17)				Overall (n = 29)			
	M	SD	Min	Max	M	SD	Min	Max	M	SD	Min	Max
Social Responsibility	2.53	0.36	2.14	3.29	2.57	0.47	2.00	3.28	2.55	0.41	2.00	3.29
Global Competence	3.24	0.39	2.67	4.17	3.04	0.24	2.75	3.42	3.14	0.33	2.67	4.17
Global Agricultural Engagement	3.54	0.45	2.83	4.50	3.42	0.59	2.83	4.50	3.48	0.52	2.83	4.50
Overall	3.12	0.24	2.76	3.52	3.00	0.24	2.64	3.52	3.05	0.24	2.64	3.52

Following the completion of HIE components each year, respondents across both cohorts completed the Global Citizenship scale as a posttest indicated a mean global citizenship score of $M = 4.11$ ($SD = 0.36$). For constructs within the global citizenship scale, respondents reported scores of $M = 4.01$ ($SD = 0.43$) for social responsibility, $M = 4.11$ ($SD = 0.48$) for global competence, and $M = 4.23$ ($SD = 0.44$) for global agricultural engagement. Posttest results are shown in Table 4.

Table 4*Global Citizenship Scale Posttest Scores by Cohort*

	Cohort 1 (n=12)				Cohort 2 (n=17)				Overall (n=29)			
	M	SD	Min	Max	M	SD	Min	Max	M	SD	Min	Max
Social Responsibility	4.26	0.19	4.00	4.57	3.83	0.46	2.71	4.57	4.01	0.43	2.71	4.57
Global Competence	4.54	0.20	4.33	4.92	3.81	0.38	2.67	4.25	4.11	0.48	2.67	4.92
Global Agricultural Engagement	4.53	0.27	4.00	5.00	4.02	0.42	2.83	4.50	4.23	0.44	2.83	5.00
Overall	4.46	0.16	4.20	4.76	3.87	0.23	3.32	4.24	4.11	0.36	3.32	4.76

We conducted a paired samples *t*-test to examine differences in global citizenship scores between the pretest and posttest distributions for participants. We found that the global citizenship scores for participants were significantly higher at the end of the program ($M = 4.11$, $SD = 0.36$) than at the beginning of the program ($M = 4.11$, $SD = 0.36$) ($t(28) = -15.02$, $p = .001$). Scores were also higher for each of the constructs within the global citizenship scale including higher scores at the posttest for social responsibility ($t(28) = -13.84$, $p = .001$), global competence ($t(28) = -11.21$, $p = .001$), and global agricultural engagement ($t(28) = -6.05$, $p = .001$). Results of the paired samples *t*-test are shown in Table 5.

Table 5*Paired Samples t-Test for Difference in Global Citizenship from Pretest to Posttest*

	<i>t</i>	<i>df</i>	Sig. (2-tailed)	Cohen's <i>d</i>
Social Responsibility	-13.84	29	<.001	0.56
Global Competence	-11.21	29	<.001	0.51
Global Ag Engagement	-6.05	29	<.001	0.68
Overall	-15.02	29	<.001	0.39

Conclusions, Implications, Recommendations

Based on the results from this study, pre-service agricultural teacher candidates from two different cohorts representing two different agricultural teacher education programs located in different parts of the US benefited from high impact experiences related to global citizenship. The GOALS program's intentionally designed high-impact experiences fostered the development of pre-service agricultural teacher candidates' overall global citizenship, encompassing all three domains: social responsibility, global competency, and engagement with global agriculture. Global citizenship is built over a lifetime in many ways, whether that is through international experiences like study abroad and/or through specifically designed programs that create educational opportunities for global citizenship development such as GOALS.

Educators with higher global citizenship have an increased capacity to help increase the global citizenship of their students (Kerkhoff & Cloud, 2020; Arnett-Hartwick, 2016). Teachers are at the forefront of bringing global awareness and perspectives into the classroom (Tichnor-Wagner et al., 2016; Lock, 2014). Purposefully providing opportunity for development of global citizenship through agricultural teacher education programs better equips future teachers with the knowledge, skills and dispositions needed to develop a globally ready future workforce and talent pipeline in food, fiber, and natural resources (Wagner, 2010).

As we operate in resource constrained environments to deliver our teacher education programs, it is worthwhile to note that gains in global citizenship with these cohorts of teacher candidates in this program were achieved in purposefully designed domestic experiences. This suggests that while the literature (Fisher et al. 2023; Sobkowiak, 2019) indicates that study abroad improves global competency, study abroad should not be viewed as the only avenue to providing these learning outcomes to students and perhaps there are other cost-effective measures to develop similar knowledge, skills and dispositions. Study abroad is a valuable tool offering students international immersive experiences, but it is not the only tool available to them.

Recommendations for Future Practice

Higher education professionals, particularly university agricultural teacher educators, should explore introducing global citizenship integrated into courses to provide instructional context. To advance global citizenship development, high-impact experiences should be designed to consider learning opportunities around social responsibility, global competency and global agricultural engagement. Data suggests that particular attention should be paid to the domain of social responsibility with opportunities for engagement and reflection on activities in that area. In addition, US agricultural teacher education programs should seek out opportunities for collaboration and joint agricultural teacher education learning experiences to allow for teacher candidates to grow and develop their teacher identity, including global citizenship, with the benefit of exposure to diverse perspectives and backgrounds.

Recommendations for Future Research

Future research should be conducted exploring how the addition of international experiences influences global citizenship gains as compared to domestic global learning experiences. While international experiences are enjoyable, often, contextually relevant global international experiences in agricultural education are not offered often, and when offered they can be costly and not accessible to all teacher candidates during the course of the teacher preparation programs. This raises the question of equity in providing opportunities to gain these global learning outcomes for all teacher candidates including those from economically disadvantaged populations.

In addition to comparing domestic to international experiences, there is an impact and opportunity to develop global citizenship through engagement in digital and virtual environments. Finally, opportunities should be sought to explore the impact on teacher identity and sense of belonging to the profession around collaborative high impact experiences with agricultural teacher candidates from diverse institutions with diverse backgrounds and lived experiences. This presents a vehicle and opportunity to develop capacity for working on and with multicultural teams and in helping work with students with differences in social identities to optimize educational outcomes.

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