

**2022 CONFERENCE  
OF THE  
ASSOCIATION FOR  
INTERNATIONAL AGRICULTURAL  
AND EXTENSION EDUCATION**



**2022 CONFERENCE PROCEEDINGS**

**APRIL 4 – APRIL 7, 2022**

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## 2022 AIAEE Oral Presentation Sessions

**Session:** 1-A **Theme:** Gender Studies

**Room:** Epidaurus

**Discussant:** Jennifer Strong **Timekeeper:** Olivia Caillouet

- Women and Agricultural and Nutritional Decisions: A Qualitative Study in Rural Households in El Salvador. - Rafael Quijada Landaverde; Dr. Jera Niewoehner-Green; Dr. Mary Rodriguez
- A Case Study of Women's Experiences as Agricultural Faculty in Thailand's Higher Education System. Dr. Morgan A. Richardson Gilley, Dr. Richie Roberts, Dr. J. Joey Blackburn, Dr. Kristin S. Stair
- Gendered impacts of COVID-19 on food behaviors in the Middle East and North Africa region: Cases of Egypt, Morocco, and Tunisia. Tarek Ben Hassen, \*, Mohammad S. Allahyari, Hamid El Bilali, Islam Mohamed Kamel, Khaled Sassi, Hanen Ben Ismail, Hajer Debbabi, and Soroush Marzban
- Development of a Feminist Literature Supported Continuum for Food Safety Research in Developing Nations. Bryanna Nelson, Dr. Hui-Hui Wang

**Session:** 1-B **Theme:** International Development Considerations

**Room:** Ephesus 2&3

**Discussant:** Grady Roberts **Timekeeper:** Katrina Alford

- Training, Trust, and Technology: A Mixed-Methods Study of Latin American Extension Workers' Experiences During COVID-19. Pablo Lamiño Jaramillo, Amy E. Boren Alpizar, Sarahí Morales Vanegas, Carla Millares Forno
- Stresses and vicarious traumatization of agricultural extension professionals in responding to weather-related disaster: The case of Trinidad extension during Tropical Storm. Karen Moses Mike, Ricky Telg, Amy Harder, Jamie Loizzo, Angela Lindsey, Shelli Rampold
- Training and Creating Meaningful Networks among Olive Oil Producers: Evidence from the Mediterranean Region. Kyriaki Zinoviadou, Athanasios Gertsis Konstantinos Rotsios
- The Neglect of Marginalized Farmers in the Innovation-Decision Process: Precision Agriculture Adoption Attributes for Smallholder Farmers. Chin-Ling Lee, Dr. Robert Strong

**Session:** 1-C **Theme:** Agricultural Education Design Approaches

**Room:** Ballroom 3

**Discussant:** Gary Briers **Timekeeper:** Carson T. Letot

- The Role of the International Cotton Trade in establishing the Penn School, the first School for Agricultural Education for African Americans in the United States. Dr. Barry Croom, Dr. Antoine Alston
- Body-Mapping as a Pedagogical Technique for Identity Articulation within an International Agricultural Development Course. Catherine E. Sanders, Allison F. Fortner, Alexa J. Lamm

- Teachers's Perceptions of Pedagogical Change through the INGO Field of Hope's Introduction of an Agricultural Education Curriculum in Uganda: A Mixed Methods Case Study. Robin Shuffett, Dr. M. Craig Edwards
- Process Skills and Competency Gaps in Undergraduate Agricultural Extension Curriculum in South Asia: Implication for Policy Decisions. Dr. Murari Suvedi, Dr. PVK Sasidhar

**Session:** 1-D **Theme:** Food Systems Innovations

**Room:** Ballroom 1

**Discussant:** Courtney Meyers **Timekeeper:** Jacqueline Aenlle

- Dynamic Model of Food Heritage and Preservation: Analyzing culture in global foodways. Barbara L. Worley, Dr. Abigail Borron
- Innovative Solutions for Food Systems Issues: A Framework for Applying Systems Thinking and Adaptive Leadership. Dr. Jera Niewoehner Elizondo Green, Dr. Mary T. Rodriguez, Jaelene Loor Suche, Kameron Rinehart
- Advantages and Foundational Issues Associated with Using Structural Equation Modeling (SEM) in International Agricultural Education Research. Kristin E. Gibson, Dr. Millicent A. Oyugi, and Dr. Alexa J. Lamm
- Climate-smart agriculture: Perception of smallholder cocoa farmers in Ghana. Akua Adu-Gyamfi, Dr. Jason McKibben, Dr. Christopher Clemons, Dr. James Lindner

**Session:** 2-A **Theme:** Organizational and Leadership Development **Room:** Epidaurus

**Discussant:** Sarah Bush **Timekeeper:** Jacqueline Aenlle

- Leveraging Expert Consensus to Identify Barriers and Strategies to Build Diversity, Equity, and Inclusion in Extension. Cody Gusto, John Diaz, Lendel Narine, Colby Silvert, K.S.U Jayaratne
- Eurocentric Attitudes about Agriculture at a U.S. Land Grant University. Gary Wingenbach, Alison Wooten
- Agricultural Industry Leaders Exploration of Stoicism. Amy Brown, Dr. Nicole Stedman, Bradley Coleman, Clay Hurdle
- Overcoming Wicked Problems in International Agriculture through Team Science: Identifying the Characteristics of a High Performing, Interdisciplinary Team. Kristin E. Gibson, Dr. Millicent A. Oyugi, Dr. Alexa J. Lamm, Dr. Janine Sherrier

**Session:** 2-B **Theme:** Resilience and Sustainability

**Room:** Ephesus 2&3

**Discussant:** David Lawver **Timekeeper:** Karissa Palmer

- Examining Smallholder Coffee Farmer' Perceptions Driving Collective Actions. Colby J. Silvert, Dr. John Diaz, Dr. Laura A. Warner, Willis Ochieng
- A Farmer-to-Farmer Extension Certification: A Proposition to Improve the Sustainability of Smallholder Agricultural Development. Colby J. Silvert, Dr. John Diaz, Dr. Grady Roberts, Bradley M. Coleman, Whitney A. Stone

- Soil Allies for International Development: Blending Agroecological Research with Innovative Community Outreach. Dr. Adam B. Cobb, Dr. M. Craig Edwards
- The Role of Universities in Convening Global Dialogues for Collective Action Towards More Resilient Food Systems. Carmen N. Benson, Danette Philpot

**Session:** 2-C **Theme:** Study Abroad Experiences

**Room:** Ballroom 3

**Discussant:** Eric Rubenstein **Timekeeper:** Tracy James

- Going the Distance: An Analysis of a Long-Term International Fellowship Program. Meikah Dado, Jessica R. Spence, Jack Elliot
- Lived Experiences of Aspiring Veterinarians: The Essence of an Undergraduate Study Abroad Course. Dr. Jose M. Uscanga, Dr. M. Craig Edwards, Dr. J. Shane Robinson, Dr. Robert Terry, Jr., Dr. Udaya DeSilva, Dr. Mariano Hernández Gil, Dr. Vivianne Perez Safady
- Impact of an Undergraduate Study Abroad Course on Career Aspirations of Aspiring Veterinarians: A Retrospective Evaluation. Dr. Jose M. Uscanga, Dr. M. Craig Edwards, Dr. J. Shane Robinson, Dr. Robert Terry, Jr., Dr. Udaya DeSilva
- An Evaluation of Graduate Students' Participation in High-Impact Learning Experiences. Bradley M. Coleman, Dr. J.C. Bunch, Colby J. Silvert

**Session:** 2-D **Theme:** Youth and Young Adult Education

**Room:** Ballroom 1

**Discussant:** Dr. Misty Lambert **Timekeeper:** Jaelene Loo Suche

- Using Children's Literature as a Gateway for Exploring International Culture. Dr. Jennifer Strong, Karly Anderson, Dr. Barry L. Boyd
- Agricultural Education and Youth Migration: A Comparison of El Salvador, Honduras, and Ecuador. Pablo Lamiño Jaramillo, Amy E. Boren Alpizar, Carla Millares Forno
- Student Assessments of Virtual Reality Equine Curricula: Results from COVID-19 Induced Cyber Instruction. Dr. Robert Strong, John Mark Palmer III, Dr. Jennifer Zoller
- Sustainable Agriculture: Relationship between Knowledge and Attitude among University Students. Carlos Durán, Bernardo Trejos, Amy E. Boren Alpizar, Pablo Lamiño Jaramillo

**Session:** 3-A **Theme:** Pre-service Teacher Experiences Abroad **Room:** Epidaurus

**Discussant:** Barry Croom **Timekeeper:** Katrina Alford

- Elements of Globally Competent Teaching in Pre-Service & In-Service Agricultural Educators after Participation in a Maymester Study Abroad Program to [COUNTRY]. Melissa Grant, Sarah LaRose, Mark Russell, JoAnn Phillion
- A Whole New World: The Motivations of Parents of First-Generation College Freshman in the [State] University College of Agriculture Regarding their Child Studying Abroad. Dr. Lacey Roberts, Dr. Richie Roberts
- Opportunities and Challenges of Students at Auburn University. Tracy James, Akua Adu-Gyamfi, Makeda Nurradin, Da Hao, Dr. Jason McKibben, Dr. James Lindner.

- Exploring International Graduate Students' Knowledge Levels and Interest in State-of-the-Art Research Tools and Collaboration. Dr. Millicent A. Oyugi, Dr. Mathew Baker, Dr. Agnes O. Oywaya, Kristin E. Gibson, Dr. Alexa J. Lamm

**Session:** 3-B **Theme:** Program Evaluation

**Room:** Ephesus 2&3

**Discussant:** Mary Rodriguez **Timekeeper:** Karissa Palmer

- Moving Toward a Social Impact Assessment: The CD+SI Toolkit. Dr. Abigail Borron, Dr. Kevan Lamm, Dr. Keith Atkins, Joseph Barbaree
- The Rate of Adoption and Factors Influencing Farmers' Adoption of Hermetic Storage Technology in Dromaa, Ghana. Namah Taku-Forchu, Misty D. Lambert, Michael S. Retallick, Jonathan D. Ulmer, George P. Opit
- Utilizing a Community Capitals Framework to Evaluate a Community-Based Intervention: Application of the CD+SI Toolkit. Catherine E. Sanders, Nekeisha L. Randall, Alexa J. Lamm, Kevan W. Lamm
- Impact Evaluation for Evidence-Based Decision Making through Engaged Scholarship in Food, Agriculture, Natural Resources and Related Sciences. Dr. Kim E. Dooley, Dr. Robert Strong, Dr. Theresa P. Murphrey, Dr. Jen Strong, Dr. Chanda Elbert, & Dr. Mathew Baker

**Session:** 3-C **Theme:** Program Evaluation

**Room:** Ballroom 3

**Discussant:** Kristina Hains **Timekeeper:** Meikah Dado

- Factoring Food Security: A Q Methodology Study with Ghanaian Educators. Jessica R. Spence, Carson Letot, Dr. Tobin Redwine
- Comparing and Contrasting Agricultural Extension Services Around the World: An Analysis. Dr. Rama Radhakrishna, Mallen Marlowe, Alejandro Gil, Carson Letot, Carolyn Henzi, Emma Wallece, Tyler Mcfeaters
- Poetic Transcription for Identity Exploration: Engaging Arts-Based Analyses for Community-Based Program Evaluation. Catherine E. Sanders, Alexa J. Lamm
- The Social Side of Soils: A Farmer Centered Analysis on the Adoption of Cover Crops. Paige Allen, Dr. Ataharul Chowdhury

**Session:** 3-D **Theme:** Need Assessment

**Room:** Ballroom 1

**Discussant:** John Preissing **Timekeeper:** Rafael Landaverde

- Farmers' Information needs and perceptions about Livestock and Dairy Development Department in Pakistan. Muhammad Saleem, Shoukat Ali, Aqeela Saghir, M. Qamar Bilal, Mark Russell
- Understanding Niche Markets for Luxury Flowers: Implications for Economic Development in Mexico. Dr. Luis A. Flores, Dr. Patricia Porrás-Loaiza, Dr. M. Craig Edwards
- Perceived educational needs of Iranian agriculturals' students towards agricultural new conceptual trends. Tarek Ben Hassen

**Session:** 4-A **Theme:** International Extension Experiences **Room:** Epidaurus

**Discussant:** Amy Michelle Brown **Timekeeper:** Makeda Nurradin

- International Graduate Students' Classroom Experiences in U.S. Agricultural Education and Extension Programs. Dr. Fallys Masambuka-Kanchewa, Dr. Shuyang Q,u & Dr. Lauren Cline
- Reflective Perspectives of Host and Guest Participants of an International Professional Development Experience Dr. Melanie Miller Foster, Joseph Cho, Dr. Laura Rice, Brad Kinsinger, Dr. Daniel Foster, Dr. Nur Husna Abd Wahid
- A Retrospective Inquiry into the Impact of COVID-19 on Agriculture Students' Experiences on a Study Abroad Trip to the United Kingdom. James D. Scott, Jade L. Frederickson, Dr. Eric D. Rubenstein
- Picture This: Using Photovoice to Increase Student Engagement and Cultural Awareness in Agricultural Communications Courses. Dr. Shannon L. Norris

**Session:** 4-B **Theme:** Information Sharing **Room:** Ephesus 2&3

**Discussant:** Abigail Borron **Timekeeper:** Tracy James

- Combatting Online Agriculture Misinformation (OAM): A Perspective from Political Economy of Misinformation. Dr. Ataharul Chowdhury, Md. Firoze Alam
- Consumer Knowledge and Confidence of the U.S.-China Agricultural Trade Dispute. Gary Wingenbach, Allison Wooten
- Sure Sources: Understanding College Students' Trust in Video Messages about the COVID-19 Vaccine from International and Domestic Sources. Valentina Castano, Alena Poulin, Dr. Lauri M. Baker, Dr. Ashley McLeod-Morin, Olivia Doyle, Meredith Oglesby, Dr. Lisa Lundy

**Session:** 4-C **Theme:** Youth and Young Adult Education **Room:** Ballroom 3

**Discussant:** Richie Roberts **Timekeeper:** Kim Dooley

- Improving Secondary School Students Mental Health: The Applicability of Sociohorticultural Reusable Learning Objects. Emily G. Wintermute, Dr. Robert Strong
- Supporting Youth Development through a Continuum Model. Meikah Dado, Jack Elliot, Ph.D.
- Camaraderie, Culture, and Connection: A Photovoice of a Long-Term International Fellowship. Jessica R. Spence, Dr. Tobin Redwine
- Settling In: Lessons Learned in Facilitating Student Successes in the First Year of International Degree Programs for Afghan Scholars. Carmen N. Benson, Jessica Garrels, Razgul Dawar, Manish Jain, Dr. Kurt Richter

**Session:** 4-D **Theme:** Wicked Problems

**Room:** Ballroom 1

**Discussant:** Craig Edwards **Timekeeper:** Olivia Caillouet

- Natural Disasters Mental-Health Impacts on Australian, Greek, and United States Farmers. Karissa Palmer, Dr. Robert Strong
- Competition for Water Resources: Experiences from Rural Households in Sub-Saharan Africa. Rafael Quijada Landaverde; Dr. Mary Rodriguez, Vinicius De Melo Justo, Dr. Amanda Robinson, Dr. Rebecca Gianotti
- Evaluating the Use and Potential for Broader Adoption of a Saliva-based Malaria Detection in Sub-Saharan Africa. Dr. John Diaz, Willis Ochieng, Colby Silvert, Cody Gusto
- Farmers' Occupational Stress and their Career Commitment During Pandemic. Carolyn Henzi, Dr. Suzanna Windon

## **2022 AIAEE Poster Presentations**

**Session:** Poster Session

**Room:** Regency Ballroom

- Students' Sentiments and Perception of Roundtable Classrooms in a Course of Agricultural Ethics. Dr. Carla Millares Forno, Dr. Sofía Brizuela Obando, Dr. Esteban Montenegro Montenegro
- Aligning with African Agricultural Development Needs: The Case for School-Based Agricultural Education (SBAE). Jack Elliot, Ph.D., Haley Traini, Trent McKnight, Tobin Redwine, Jess Spence, Meikah Dado
- Taking You There Without Traveling: Virtual Exchange and Study Abroad. Helen Yarenis, Eleni Kantyltzoglou, Kim Dooley
- Exploring the Effectiveness of Online Webinars as a Tool for Increasing Extension Professionals' Confidence. Olivia Caillouet, Dr. Amy Harder, Dr. Matt Bengé
- The Use of Data Visualization Dashboards to Communicate Program Outcomes and Impact. Dr. Amanda D. Ali, Dr. Paul A. Hill, Dr. Dominic Bria, Dr. Lendel K. Narine
- Climate-based convergence strategies to facilitate sustainable learning among row crop producers and agricultural stakeholders. Hannah Stewart, Dr. Michelle Worosz, McKayla Robinette, Dr. Brenda Ortiz, Dr. Audrey Gamble, Dr. Leah Duzy, and Dr. Rishi Prasad
- Strategies to Advance Diversity, Equity, and Inclusion in International Agricultural and Extension Education Programs. Scott D. Scheer
- Benefits of International Extension Experiences: A Systematic Review of the Literature. Benjamin B. Grove, Sarah A. Bush, Jeremy Elliott-Engel
- Climate Change: Relationship between Knowledge and Awareness in Students of an Agricultural University in Ecuador. Pablo Lamino Jaramillo, Gloria Cornejo Calvachi, Amy E. Boren Alpazar, Bernardo Trejos
- The importance of organizational strengthening in a cocoa-based association in Guayas, Ecuador. Pablo Lamino Jaramillo, Renzo Ceme Vines, Amy E. Boren Alpazar, Gabriela Suchiapa

- Farmers' Motivation for Learning and Developing New Skills. Dr. Suzanna Windon, Carolyn Henzi
- Extension Internships Build Competencies for Career Readiness and Interest in Extension Careers: Implications for International Extension Education. Dr. Joseph L. Donaldson, Dr. K.S.U. Jayaratne
- Finding Disciplinary Literacy Capacities Between Cultures: An Inquiry in United States Secondary School Agriscience Education Classrooms Between English Language Learners and Native English Speakers. Dr. Chris Clemons, Dr. Jason McKibben, Dr. James Lindner
- The Study Abroad Experiences of Secondary Agriculture, Food and Natural Resources Students. Samantha J. Ludlam, R. Bud McKendree, Aaron J. McKim
- Teaching the Human Dimension in Agricultural and Natural Resources: Lessons Learned from a Field Experience Examining the Impact of Hurricane Michael. Robert Strong, Amy Harder, Grady Roberts
- Exploring the Influence of International Scholars on Social Media Engagement across Platforms. Allison R. Fortner, Catherine E. Sanders, Dr. Alexa J. Lamm
- Virtual Reality Diffusion in Agricultural Institutions: Addressing COVID-19 Instructional Challenges
- Perspectives on Food Security through the Lenses of Food Waste for International Agricultural Extension Education. Olawunmi T. Ilesanmi, Jack Elliot, Ph.D.
- A Podcast Ethnography: Exploring COVID-19's Effect on the Scientific Enterprise. Jacqueline Aenlle, Dr. Jamie Loizzo, Maegan Meredith, Alice Akers
- Culture and COVID-19: Global implications of perceptions of race and cultural relations during the COVID-19 pandemic in the United States. Sydney Honeycutt, Cheng-xian Yang, Lauri M. Baker, Olivia Doyle, Jarred Shellhouse & Cecilia Suarez
- Maize farmers' preference and trustworthiness of the sources and channels to receive agricultural information in Dormaa, Ghana: A gender perspective. Namah Taku-Forchu, Misty D. Lambert, Michael S. Retallick, Jonathan D. Ulmer, Shuyang Qu, George P. Opiet
- Investigating the impact of COVID-19 on African Regional Economic Communities (RECs); A Case Study of The Continental SPS Committees. Olawunmi T. Ilesanmi, Megan L. Gould, Jack Elliot, Ph.D.
- Linking human capital development to women's empowerment and inclusion: Results from four country case studies. Kristin Davis, Johanna Gammelgaard, John Preissing
- Monitoring Bee Health Through Citizen Science in Western Uganda. Gabriella Bragoli, Marianne Staniunas, Dr. Emily Otali, Dr. Elizabeth Ross, Turyatunga Vallenge, Kajura Derrick



- Urban Urgence: The Importance of Introducing Urban Farming with Secondary Agricultural Instructors in Northern Uganda. Nicholas Ssembalamu, Joseph Apea, Agnes Obote, Alexa Major Wilcox, Jessica Spence, Dr. Tobin Redwine
- Belief vs. Action: Analysis of General Global Knowledge and Global Citizenship. Gary Wingenbach, Alison Wooten
- The Contribution of Extension in the Improvement of Rural Livelihoods. Evangelos Vergos, Konstantinos Zoukidis, Marios Koutsoukos, Theodoros Blioukas
- Showing more than Telling: Pre-Vet Students' Photovoice Narratives from a Study Abroad Course. Dr. Jose M. Uscanga, Dr. M. Craig Edwards, Dr. J. Shane Robinson, Dr. Robert Terry, Jr., Dr. Udaya DeSilva
- Empowering Women through Artisan Cooperatives in Sub-Saharan Africa. Garrett S. Brogan, Dr. Kim Dooley
- A Call for a Paradigm Shift Towards Systems Thinking: A Needed Change for Practitioners of Agricultural and Extension Education. Katrina R. Alford, T. Grady Roberts
- Empowering Ugandan Youth in the Groundnut Value Chain using Photovoice. Annie Carter, Tom Gill, David R. Ader, Carrie A. Stephens, Archileo Kaaya, Stephen Lwasa, David Musoke, Daisy Kemigisha, Ruth Martha Mirembe, David Okello
- A Fissure in Focus? Stakeholders perceptions of needs and priorities at local, state, national, and international levels. Dr. Lauri M. Baker, Anissa M. Zagonel, Ricky Telg
- Nonprofit Organizations' Volunteer Retention During the COVID-19 Pandemic. Suzanna Windon Ph.D., Daniel Robotham, Ann Echols Ph.D.
- Assessing the impact of parental involvement on the scaling of agricultural technologies from school garden to home farm through experiential learning. Gracie Pekarck, Dr. David Ader
- Lessons Learned from a Tailored Evaluation Capacity Building Initiative in Extension. Dr. Lendel K. Narine, Dr. Amanda D. Ali
- Organizing and Utilizing Community Advisory Committees for Research, Outreach, and Extension Efforts Impacting Agriculture and Natural Resources. Dr. Ricky Telg, Dr. Angie Lindsey, Dr. Tracy Irani, Dr. Lisa Lundy, Ashley McLeod-Morin, Phillip Stokes, Sydney Honeycutt, Valentina Castano, Michaela Kandzer, Nathalie Santa Maria
- Stakeholder Engagement in Environmental Management: A Case of St. Martinâ's Island, Bangladesh. Sharmistha Basak, Dr. Anil Kumar Chaudhary
- Promoting Cultural Plurality through Reflective Blogging in a Global Agricultural Leadership Course. Emmanuel Kanchewa, Dr. James C. Anderson II

**Women and Agricultural and Nutritional Decisions: A Qualitative Study in Rural Households in El Salvador.**

**Rafael Quijada Landaverde**

Department of Agricultural Communication, Education and Leadership  
The Ohio State University, 208 Agricultural Administration Building, 2120 Fyffe Road,  
Columbus, Ohio, 43210. Email: quijadalandaverde.1@buckeye.mail.edu

**Dr. Jera Niewoehner-Green**

The Ohio State University

**Dr. Mary T. Rodríguez**

The Ohio State University

Keywords: Agriculture, Food security, Women.

**Introduction**

Women often perform jobs that contribute to family agricultural production; unfortunately,

agriculture continues to be considered a masculine sphere (Doss et al., 2018). This social phenomenon contributes to the lack of visibility that women have as agricultural workers. Further, by not acknowledging this ‘invisible’ agricultural work, female participation in decision-making at home and the community level can be limited (Doss et al., 2018).

The feminization of agriculture is a growing phenomenon in most regions of the world. In 2018, it was estimated that at least 70% of rural women were dedicated exclusively or partially to agriculture in the world (Pattnaik et al., 2018). Therefore, women can be strategic allies in the fight against poverty, malnutrition, and food insecurity in their communities, if they have the resources to engage in agriculture productively (FAO, n.d.).

Inequality between women and men is a consequence of the differential access and participation in favor of men in social, political, and economic structures (Anderson et al., 2021). Developing countries experience significant gender gaps that compromise women’s well-being. According to Singh et al. (2020), for food and nutrition security to improve at any scale, women must be integrated as agents and beneficiaries of change. Empowering women in agricultural decision-making requires studying the dynamics of decision-making to revalue the role of women in agriculture, as one of the influencers and transformer of her environment (Anderson et al., 2021).

### **Purpose and Research Questions**

This qualitative study aimed to explore women’s participation in agricultural and food decision-making in rural households in El Salvador. The following research questions served to guide this study:

1. How do women perceive their participation in the agricultural and food decision-making processes at home?
2. What are the limitations that women face to make agricultural and nutritious decisions?
3. How do decision-making dynamics affect household food and nutrition security?

### **Methodology**

This study used an ethnographic approach to examine women's experiences in decision-making about food and nutrition security. Nine women from Chalatenango, El Salvador, participated in semi-structured interviews. The interviews were conducted in December 2019 at each participant's residence, lasted an average of one hour, and were conducted in Spanish. Grounded theory methods (open coding and axial coding) were implemented to identify emerging themes within the analysis of the interviews (Creswell, 2007).

### **Results**

#### **Decision making at home**

Participants perceived agricultural decisions as a men’s responsibility and nutritional decisions woman's responsibility. A participant stated, "My husband is deciding what we are going to cultivate. He tells me what he needs me for, and I help him in the field. After that, I have to decide what we are going to eat." Women described themselves as not having decision-making

power over land, inputs, production, and profits from agriculture, even when they own the land and have worked in agriculture. A woman commented: "The land we have was an inheritance from my father ... I let him [husband] decide what we are going to harvest at every season."

For the food and nutrition of the household, women understand it as their responsibility to ensure that there is enough food for each family member. A participant mentioned: "I cook every meal for everyone. I must make sure we have food so we can all eat. If it is not enough; usually, I am the one who must eat something else." According to the participants, there are some decisions related to agricultural production that they would make differently considering the food preferences of the household members.

### **Women's participation**

Consultation on agricultural issues is usually focused on satisfying the needs of men. Public and private entities rule out the participation of women in agriculture. One of the women commented: "When they come to offer agricultural services / products, they always ask for my husband. If he is not there, they leave." Women also do not find the same support that their spouses receive when they decide to start an agricultural project.

At the household level, women perceive that historically it has been the men's responsibility to decide how agricultural resources and profits from production are managed and used. A woman mentioned: "He gives me money, so I can buy what we need in the house. I must make that money enough to cover the expenses of the house." In addition, women transfer these ideas to new generations, a woman mentioned "I have taught my daughters how to work at home and in the fields."

### **Implications on food security and nutrition**

The disparities among family agricultural production, food preferences, and nutritional needs results from the separation of roles in decision-making between women and men and affects food and nutrition security. One participant mentioned: "What we produce the most is corn. We hardly ever grow vegetables... what we like to eat the most are fruits and vegetables, but we can't afford to buy them. "

Women usually seek to diversify the family diet, especially by incorporating animal proteins. However, the low participation in decision-making on the use of resources is limiting for women to implement changes in the family diet. For example, one participant mentioned: "I wish I could have a chicken pen and maybe even a pig. But my husband says it's a lot of work. So that is not worth it."

### **Conclusions and recommendations**

Women have shown the ability to make more efficient decisions in the use of resources, with positive implications for the food and nutritional security of the family. The exclusion of women from decision-making in agricultural production creates a significant gap between what is produced, and the food needed to satisfy the needs and preferences of family members (Anderson et al., 2021).

Future research is recommended to quantitatively explore other sociodemographic factors that could influence women's decision-making as well as examine the associations between women's decisions and the indicators of food and nutritional security for family members. For practitioners, women should be offered the same opportunities and access as men in any initiative aimed at agricultural production and food and nutritional security.

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**A Case Study of Women's Experiences as Agricultural Faculty in Thailand's Higher  
Education System**

**Authors**

Morgan A. Richardson Gilley, Ph.D.  
**Louisiana State University**

Richie Roberts, Ph.D.  
**Louisiana State University**

J. Joey Blackburn, Ph.D.  
**Louisiana State University**

Kristin S. Stair, Ph.D.  
**Louisiana State University**

# **A Case Study of Women's Experiences as Agricultural Faculty in Thailand's Higher Education System**

## **Introduction**

The agricultural industry and higher education have traditionally been male-dominated spaces in the developing world (Eboiyehi et al., 2016). However, in recent decades, significant progress in female representation has been achieved in both sectors. Despite identifying these barriers, research on gendered issues in higher education institutions in developing nations has primarily focused on the participation rates of female students and their educational attainment (Francis et al., 2014; Phipps & Smith, 2012). Consequently, Morley and Crossouard (2015) called for more attention to be placed on women faculty in Southeast Asia's institutions of higher education, particularly in Thailand. Therefore, a need emerged to understand how women in Thailand navigate their professional responsibilities as agricultural faculty despite pervasive gender inequalities in the country.

## **Philosophical Lens**

We examined women agriculture faculty's experiences in Thailand through the lens of critical constructionism (Denzin & Lincoln, 2008). When using this lens, researchers position themselves "at the intersection of multiple epistemological and theoretical perspectives such as constructionism, social constructionism, and critical theory" (Richardson & Roberts, 2020, p. 10). Crotty (1998) advanced this lens to help social scientists analyze complex phenomena deeply influenced by power, privilege, and control issues.

## **Statement of Purpose**

This study aimed to examine the experiences of women agriculture faculty in Thailand's higher education system.

## **Methods/Procedures**

To achieve the study's purpose, we used an instrumental case study design (Stake, 1995). We bounded the case by *place*, i.e., Thailand, and *participants' occupation*, i.e., women agriculture faculty. We also imbued rigor by embedding Lincoln and Guba's (1985) four standards of quality into the study's design: (1) confirmability, (2) credibility, (3) dependability, and (4) transferability.

To collect data, we used a combination of purposive and snowball sampling procedures (Patton, 2002). Through this approach, we identified four women faculty from Thai universities with a Faculty of Agriculture, i.e., a College of Agriculture. The primary source of data for this investigation was semi-structured interviews conducted virtually using Zoom video conferencing software. To triangulate findings, we also collected photographs and written reflections submitted by the participants. However, we could not feature the photographs in this abstract because of AIAEE Conference submission requirements. After collecting data, we analyzed each source using analytic coding procedures advanced by Saldaña (2021). The first cycle of coding involved two open coding techniques: (1) initial coding and (2) values coding (Saldaña, 2021).

Following the first coding cycle, we engaged in pattern coding, which allowed us to reduce the codes from the first cycle into overarching themes (Saldaña, 2021).

## **Findings**

Our analysis of the data revealed three themes that depict women's perspectives on Thailand's higher education: (1) gendered disparities, (2) barriers to success in academia, (3) perceptions of self and gender in agriculture and higher education.

### **Gendered Disparities**

The first theme explored women agriculture faculty's experiences with societal gender inequalities. The emergence of this theme was likely because faculty in postsecondary agricultural programs have traditionally been expected to extend their work into local communities through extension programs in Thailand. Despite expressing positive self-perceptions, the women also voiced a number of traditional gender stereotypes. To this point, the participants articulated how males were more often promoted to leadership roles in higher education. Participant #2 stated: "[Thai] people accept more males than females." She further explained: "I think for agriculture higher education, there were more males than females in the past, and now females have a [place] in this career..."

### **Barriers to Success in Academia**

The women in this study also expressed multiple barriers to their success as faculty. For example, because of expectations for women to fulfill feminine and domestic roles, they often received fewer work-related opportunities and experienced underrepresentation in their careers. On this point, participants explained how Thai women were primarily concerned with ensuring they devoted adequate time to their families. Because academic roles were often considered more flexible than other career fields, they perceived their careers promoted work-life balance. Nevertheless, Participant #1 discussed how placing more "emphasis on family" could also be viewed as a potential barrier to success for women faculty in Thailand because some administrators might view them as not prioritizing their work.

### **Perceptions of Self and Gender in Agriculture and Higher Education**

Despite the perceived barriers to success experienced by women agriculture faculty, the participants in this investigation reported a distinctly positive perception of self and their abilities. For example, all participants reported that females were as capable as males in higher education. Moreover, Participant #4 stated: "females can do like a man do" and "we can do the same way as a male do." Beyond that, in multiple ways, the women of this study felt respected in their profession. Most of the women explained they were well regarded as lecturers and research scientists. "I think I get the respect from a student and from staff...we get respect from all," said Participant #3.

## **Conclusions, Implications, Recommendations, and Education Significance**



Morley and Crossouard (2015) reported that there had been an overall increase in women's presence as students and faculty at higher education institutions across the globe. However, findings from this investigation complicated such a notion. For example, although the participants perceived the number of women obtaining faculty positions in agriculture had increased, these positive trends did not extend to upper-level academic positions, such as department heads, deans, and university presidents. We recommend that Thai university administrators create leadership development programs for women faculty to learn ways to successfully navigate academic culture and obtain administrative positions that could allow them to enact positive change. We also call for a deeper examination of Thai women's perceptions of self. For example, the participants in this investigation reported they felt respected and viewed positively by students and other stakeholders. Although such a finding indicated progress regarding gendered disparities, this could also lead to potential setbacks for women in the future. For example, if Thai women do not recognize the need to advocate for greater gender equality in higher education, it could stymie women's progress in the future.

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## **Gendered impacts of COVID-19 on food behaviors in the Middle East and North Africa region: Cases of Egypt, Morocco, and Tunisia**

Tarek Ben Hassen<sup>1,\*</sup>, Mohammad S. Allahyari<sup>2,3</sup>, Hamid El Bilali<sup>4</sup>, Islam Mohamed Kamel<sup>5</sup>, Khaled Sassi<sup>6</sup>, Hanen Ben Ismail<sup>7</sup>, Hajer Debbabi<sup>7</sup>, and Soroush Marzban<sup>8</sup>

<sup>1</sup> Department of International Affairs, College of Arts and Sciences, Qatar University, Doha 2713, Qatar; *thassen@qu.edu.qa*

<sup>2</sup> Department of Agricultural Management, Islamic Azad University of Rasht, Rasht 41476-54919, Iran

<sup>3</sup> North-West University, Faculty of Economic and Management Sciences, Private Bag X2046, Internal box 575, Mmabatho 2735, South Africa

<sup>4</sup> International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM-Bari), Via Ceglie 9, 70010 Valenzano (Bari), Italy

<sup>5</sup> Master of Science, International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM-Bari), Via Ceglie 9, 70010 Valenzano (Bari), Italy

<sup>6</sup> Department of Agronomy and Plant Biotechnology, National Agronomic Institute of Tunisia, University of Carthage, Tunis 1082, Tunisia

<sup>7</sup> Department of Agri-Food Industries, National Agronomic Institute of Tunisia, University of Carthage, Tunis 1082, Tunisia

<sup>8</sup> Department of Agricultural Extension & Education, School of Agriculture, Shiraz University, Ghasro Dasht St, Shiraz, Iran

### **Keywords:**

COVID-19; SARS-CoV-2; food behavior; food shopping; food consumption; food waste; Egypt; Morocco; Tunisia; North Africa

## **Introduction**

The global food supply chain has been disrupted by the preventive restrictions related to the COVID-19 pandemic, such as lockdowns, remote work, asocial distancing, etc., exposing its vulnerabilities to shocks and crises (HLPE, 2020a; iPES Food, 2020). Further, the pandemic has revealed inequities between and within countries regarding food security and economic opportunities. The pandemic has significantly affected developing countries and vulnerable groups, deepening existing inequalities (Hoogeveen et al., 2021).

Additionally, the pandemic has different implications for men and women around the world. While globally, fatality rates are higher for men, the socio-economic consequences of the crisis are especially devastating for women (FAO, 2020; OECD, 2020b). The COVID-19 pandemic has led to significant disruptions in women's daily routines since they generally had more responsibility in family food decisions (Mazzolani et al., 2021). Changes in routine resulting from the pandemic were indicated to have more significant implications for women, with unexpected effects on eating habits (Herman & Polivy, 2010). Also, under stressful circumstances, women tend to eat more compared to males. Overall, in general, the COVID-19 had a more significant impact on the diet diversity of female households compared to male households (Ragasa & Lambrecht, 2020).

### **Purpose and objectives**

As observed globally, the COVID-19 pandemic-related measures resulted in several lifestyle changes in the Middle East and North Africa (MENA) region (CIHEAM, 2020). Several previous studies highlighted that social distancing measures applied across the region to contain the spread of the virus changed lifestyle behaviors, including eating and food shopping habits: a surge in stockpiling (CIHEAM, 2020) and online shopping (Altios, 2020; IPSOS, 2020). Also,

COVID-19 has forced people in the region to re-evaluate their overall lifestyles, and many have become more conscious about their diet. In order to improve their immune system to combat COVID-19, health has become a concern for individuals across the region (Ben Hassen et al., 2020). Simultaneously, unhealthier eating habits and food choices have been reported during the COVID-19 pandemic, such as overeating, snacking, replacing main meals with snacks, increased use of delivery services, and high ultra-processed food intake.

Specifically, the pandemic impacted women and men differently in this region and exacerbated existing socio-economic and gender inequalities (Moghadam, 2021). Region-specific restrictive social norms and legal frameworks aggravate the barriers that women confront (OECD, 2020a). Accordingly, it is crucial to recognize the extent to which the COVID-19 pandemic affected women and men's food behaviors in the MENA region differently. Therefore, the article aims to analyze the effects of COVID-19 on women's diet and food behaviors in three countries of the North-Africa sub-region, namely Tunisia, Morocco, and Egypt.

## **Methods**

The paper drew upon an online survey. The questionnaire was administered in Arabic and French, from September 15 to November 5, 2020, through the Survey Monkey platform. The total of valid collected answers was 312 for Tunisia, 340 for Morocco, and 343 for Egypt, including respectively 212, 155, and 144 women. The questionnaire consisted of 25 questions of different types (multiple-choice, one option), divided into three sections: socio-demographics, food purchase and consumption behavior, and positive and negative emotions during the pandemic.

The survey findings were downloaded for analysis into SPSS (Statistical Package for Social Sciences), version 25.0. Descriptive statistics (means, percentages, and frequencies) were

calculated. The analysis of multiple responses was performed to draw the percentages of responses and cases. Since variables were categorical and ordinal, non-parametric tests were used. The U-Mann Whitney test was used in dichotomous, categorical independent variables (e.g. gender), while the Kruskal-Wallis test was run to analyze multi-choice responses (e.g. occupation). Statistical significance for all tests was set at a p-value of 0.05.

## **Results**

The findings show that women's diet, shopping behavior, and food interactions have changed significantly. Indeed, the survey outcomes indicated (i) Women tend to eat more food out of fear, anxiety, or boredom compared to males; (ii) Women tend to eat more comfort food (candy, cookies, cakes, and pastries) compared to males; (iv) Overall, women tend to eat more unhealthy food compared to males; and (v) Women tend to stockpile more food compared to males. The findings are expected to help guide current emergency measures as well as long-term food-related policies.

## **Conclusion**

So far, the academic research on the impacts of the COVID-19 pandemic on food systems and consumption habits has been regionally unbalanced, focusing on Western and Southern Europe, North America, and China (Colafemmina et al., 2020) while developing countries in general and those of the MENA region in particular, have been overlooked. To the best of our knowledge, this is the first study on perceptions of the impacts of COVID-19 on women's food-related behaviors in North Africa, and it serves as a foundation for future research on the pandemic's impact. The paper findings indicate that the long-term impacts of COVID-19 would most certainly differ from country to country, depending not just on epidemiological conditions but

also, among other things, on the baseline socio-economic position and shock resilience (HLPE, 2020b).

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**Development of a Feminist Literature Supported Continuum for Food Safety Research in Developing Nations**

Corresponding Author Name: Bryanna Nelson, Purdue University, 915 W State Street, West Lafayette, IN 47906. Email: nelso421@purdue.edu

Co-Author Name: Hui-Hui Wang, Purdue University

Keywords: gender continuum; feminist research; international development; food safety initiatives

## **Introduction**

Through Feed the Future Innovation Labs and other research initiatives, the U.S. Government's Global Hunger & Food Security Initiative, a sector of the United States Agency for International Development (USAID) aims to catalyze ongoing scientific innovation in agriculture and promote evidence-based research (Feed the Future, 2020). Research projects being conducted through USAID need to address cross-cutting themes such as environmental health, emerging pandemic threats, and gender equality. Falling under gender equality, is the advancement of women and youth within these systems. Around the world, women are the backbone of the rural economy in the developing countries (Raney et al., 2011). Women also play an important role in food safety, because women tend to share more reproductive labor in their household (Duffy, 2007). Currently, there are varying levels of quality, integration of gender, and findings that relate to the cross-cutting themes. The gender integrated data and research collected did not readily translate to interventions, practice shifts, or ways to overcome bias and perpetuate success of women in the workforce. There is a lack of consistency in evaluation and criteria for grant funded USAID projects that aim to promote gender and social equitable agricultural innovations.

## **Purpose and Objectives**

The developing continuum was created as a backbone with the intent to deliver a tailored version citing specific examples from each USAID Food Safety Innovate Lab research proposal. The continuum builds from other gender models that have been implemented in international gender studies like the INGIA VC approach (Rubin, Mangre, & Barrett, 2009) or the GCP gender strategy (Njuki, Mutua, & Saghira, 2012), but aims to grow and develop with each team on a personalized basis. Its generalizable nature allows it to be used currently for the proposals that are being assessed.

The need was revealed when reviewing innovative food safety proposed projects that are seeking USAID funding. There was a lack of consistency in evaluation and criteria for gender and feminine research as a critical issue. This issue has challenged the reviewers to judge the quality of the proposed projects. For example, many proposed projects featured superficial integration of women stating "51% of intern recruitment will be female" or "females' recruitment will be a priority before male recruitment". Other proposed projects that aimed to research women often included methods that may not be appropriate such as "survey of how many women are involved in production" or "survey of how many female poultry producers there are". While it is important that women are serving roles in the research teams through interns, or data is collected to determine needs, many of these methods are superficial and lack methods that are appropriate for researching women in these roles (Brisolara et al. 2014). As the projects are typically headed by biological or natural scientists, there is disconnect on how to meaningfully integrate gendered studies, such as those conducted within social science. Typically, their goals for social science-based research questions lacked depth and literature supported methods, especially in relation to the inclusion of women. As these findings align with findings from USIAD (Mulema et al., 2019), a continuum for meaningful gender integration was developed.

## **Methodology**

The continuum is divided into three major sections: methodology, deliverable, and integration. The methodology section has two sub-topics, technical and gender sensitive. The

deliverable section has four subtopics, education outreach programs, education outreach materials, evaluation & research tools, and publications. The third section is a combination of sections one and two, integration, or how well their methodology and deliverable sections were integrated for their intended outcome. This section is subdivided into to topics gender and culture. Each section is supported by literature in both feminist fields of study, and agriculture, food science and safety, as well as international development, community integration, and appropriate methodologies. The continuum is broken down into stages which allow us to help the researchers and gender specialist in their research developments. The first stage is underdeveloped or absent, the second stage is present and needs improvement, which indicates that there is suggestions of support or further specific improvements are needed, and the final stage is further developments moving into an “above and beyond space”.

### **Results/Products**

The three funded projects met with the team for their initial consultation. During the semi-annual check-in meeting, the project teams were provided with an in-depth review of the continuum and worked with the gender experts to tailor the continuum to fit the needs of the teams. Following the tailored continuum, a detailed plan of action was developed for the teams so they could implement the continuum into their projects. To help further develop the continuum, the team’s gender experts were sent individualized questions to help review and guide the development of both a personalized continuum as well as a generalizable continuum that could be applied to future stages of the project. The reviewers found the continuum to be easy to read and navigate, as well as helpful in anchoring their research within gender integrated methods. They also suggested balancing quantitative and qualitative data analysis methods, as the current continuum focused heavily on qualitative methods. Other suggestions included expanding and strengthening the existing connections to gender continuums.

### **Applications and Recommendations**

The continuum is limited by three stages but has potential to be developed further as the research is a part of a multi-year project. As the research grows and develops, further stages could be designed and implemented. The continuum could also be utilized in other areas of research in STEM or agriculture such as areas in agricultural education, extension or communication with few modifications. The continuum integrates women and culture, which will hopefully encourage and guide new research in spaces where limited. As program development is highlighted in the continuum extension programs and other educational programs would be an ideal fit. The ultimate goal of the continuum is for it to be applied to other innovative lab projects, creating a structure or process as a management team to help the award granting team to reach to their highest capacity on the grounds of gender integration.

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**Training, Trust, and Technology: A Mixed-Methods Study of Latin American Extension  
Workers' Experiences During COVID-19**

**Authors**

Pablo Lamiño Jaramillo

Amy E. Boren Alpizar

Sarahí Morales Vanegas

Carla Millares Forno

## **Introduction**

The COVID-19 pandemic has affected lives around the world (Wu et al., 2020), including agriculture and agricultural extension (Li et al., 2020; Nicola et al., 2020). Latin America provides an interesting context for exploring the dynamics of agricultural extension because of the unique blend of public and private extension providers and because extension serves many smallholder farmers with agriculture as their only income (Luque Zuñiga et al., 2021).

Several studies have examined how extension services in developed countries have addressed COVID-19 challenges (Hartmann, 2021; Narine & Meier, 2020). However, no studies have been conducted to understand the adaptive response of extension in Latin American countries during the pandemic.

## **Purpose and Objectives**

The purpose of this mixed-methods sequential explanatory study was to comprehend how Latin American extension professionals worked during the COVID-19 pandemic (Creswell & Creswell, 2018). This study was framed by resilience theory, which aims to understand how people overcome adversities under a mediating process, finishing with a better-than-expected outcome (Van Breda, 2018). The main objectives were:

- (1) Explore Latin-American extension professionals' preparation to implement knowledge-sharing activities.
- (2) Examine outreach activity modifications and strategies used by extension professionals.
- (3) Evaluate the perceived literacy level and resources available to extension professionals.

(4) Explore extension professionals' responsiveness to COVID-19.

## **Methods**

### **Quantitative Phase**

Data was gathered using snowball sampling from Latin American extension workers who were implementing extension-based training during COVID-19 (N = 70). The instrument developed by Narine & Meier (2020) was adapted to the Latin American context and missing values were replaced by multiple imputation (Enders, 2017).

Descriptive statistics and percentage analysis were used to address the objectives. In addition, for objective 4 a Mann-Whitney test was run to analyze the differences in perceived response to COVID-19 between Program Directors and Field Technicians.

### **Qualitative Phase**

Using a phenomenological case study, researchers explained extension professionals' experiences during the pandemic (Creswell & Clark, 2017). Semi-structured virtual interviews were conducted with 25 participants. Researchers coded and analyzed the data by hand using inductive analysis (Saldaña, 2016). The trustworthiness of the findings was accomplished by triangulation, member checking, inter-coder agreement, and information generated from the quantitative data (Creswell & Creswell, 2018).

## **Results**

### **Quantitative**

Objective one results showed extension professionals were asked about the skills and strategies they developed during COVID-19. The highest-ranked response was "partner with other organizations to coordinate efforts".

Objective two results showed that the greatest change for extension professionals was



“learning to work from home throughout the pandemic.” Over 80% of participants transitioned to working from home.

For objective three, 70 participants considered that personal hygiene was a high-demand topic, and with a high perceived knowledge. In contrast, only 27 participants implemented telehealth, with only 54.29% indicating they had the knowledge needed.

Lastly, participants ranked “extension has the necessary experience to make the transition from traditional education to online education” as the highest response. The Mann-Whitney U test results showed a statistically significant difference in perceived response between Program Director and Field Technician. Program Directors had higher responsiveness perception ( $Mdn = 2.50$ ) than Field Technicians ( $Mdn = 2.37$ ).

### **Qualitative**

For objective one, two themes emerged: solidarity and social media as an extension tool. Extension professionals agreed that they all faced the same major challenges with COVID-19. Instead of duplicating efforts, they were grateful to combine efforts through partnerships. Participants also explained that media platforms were the only connection that extension professionals had with producers.

Two themes emerged when addressing objective two: technology and home-office. Participants described that before COVID-19, nobody was implementing online learning with rural producers; however, technology was one of the tools that showed promise. Regarding the second theme, home-office, field technicians perceived that working from home was something negative. They claimed that many of them had to change their work and their employment contracts due to working from home. They argued that the role of extension is to work with producers in the field.

For objective three, participants were asked if they were implementing COVID-19 prevention training for farmers. Serving communities and prevention actions emerged as themes for this section. Extension professionals considered that extension served as a tool to help communities address COVID-19. They mentioned that due to the pandemic, extension activities changed from their agricultural focus to a more general focus on helping farmers and their families. COVID-19 prevention actions were incorporated as part of agricultural training. Extension professionals were not providing comprehensive training to address this topic, but some of them repurposed training funding to COVID-19 prevention tool kits.

To address objective four, researchers asked extension professionals about their perception of the response that extension had on COVID-19. Resilience and different perspectives were the two themes that emerged. Most extension professionals expressed that technology must be part of extension activities. Results showed a division in resilience perceptions between younger and older generations (Erikson, 1966). Younger extension professionals were more resilient when confronting changes, while older extension professionals had difficulties with technology.

The second theme, different perspectives, highlights the difference between Field Technicians and Program Directors. Field Technicians' perceptions emphasized their inability to work in the field and provide training to farmers. In contrast, Program Directors perceived that they had adapted by implementing innovative agricultural teaching ideas.

### **Conclusions and Recommendations**

This mixed-methods study provides understanding of the importance of extension services in the Latin American region as a reliable source of information. During COVID-19, extension professionals have taken on the role of sharing up-to-date virus prevention information

for rural farmers. Based on their communicative role, it is recommended to implement training with extension professionals on effective communication strategies to use with communities during crises.

Extension workers have taken on the role of sharing up-to-date prevention information for rural farmers. Based on this communicative role, it is recommended to implement training with extension professionals on how to communicate with communities during crises, including conducting ‘drills’ for alternative approaches to outreach activities.

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**Stresses and vicarious traumatization of agricultural extension professionals in responding to weather-related disaster: The case of Trinidad extension during Tropical Storm Karen.**

Moses Mike  
California Polytechnic State University  
[mmike@calpoly.edu](mailto:mmike@calpoly.edu)  
1975 Abbott Street,  
San Luis Obispo, CA, 93401

Ricky Telg  
University of Florida  
Gainesville, Florida. USA

Amy Harder  
University of Florida  
Gainesville, Florida. USA

Jamie Loizzo  
University of Florida  
Gainesville, Florida. USA

Angela Lindsey  
University of Florida  
Gainesville, Florida. USA

Shelli Rampold  
University of Tennessee  
Knoxville, Tennessee. USA

Keywords: Resilience, Agricultural Extension, Trinidad, Vicarious Traumatization, Angry Farmers

## **Abstract**

### **Introduction/Literature review**

The Caribbean twin-island republic of Trinidad and Tobago observed an annual hurricane season from August to November (McShine et al., 2019), where weather-related disasters consistently occurred (Roopnarine et al., 2018; Shik et al., 2018). In September 2019, the Office of Disaster Preparedness and Management (ODPM), issued the highest national disaster alert in the country, as local weather worsened into Tropical Storm Karen (TSK) (Golembo et al., 2019; Moreno, 2019; Phillip, 2019). The Ministry of Agriculture, Land, and Fisheries (MALF) in Trinidad manages the extension service (Narine, 2018), and extension personnel assisted farmers throughout the course of TSK (De Souza, 2019). Extension professionals are considered pseudo-first responders to weather-related disasters in some contexts (Kerr et al., 2018). Trinidad extension professionals assist in managing weather-related disasters that occur almost annually (Gray et al., 2019). In the Trinidad context, extension professions are responsible for assessing damaged farms post disaster for the purposes of assisting farmers with accessing grants from the government as compensation for losses (Ramjattan et al., 2017; Saravanan, 2010). Previous research identified that individuals who manage disasters are subject to various forms of stress that can affect their resilience. Some of these include emotional stress (Esterwood & Saeed, 2020; Ludick & Figley, 2017), burnout (Ali, 2019; Ludick & Figley, 2017; Osofsky, 2008), dangerous environments (Gonzalez et al., 2019), social anxieties (Boulanger, 2013; Ludick & Figley, 2017; Osofsky, 2008), and vicarious traumatization (Boulanger, 2013; Ludick & Figley, 2017; Osofsky, 2008; Pau et al., 2020).

### **Purpose & Research Questions**

The purpose of this study was to identify the challenges to resilience experienced by Trinidad extension professionals in managing TSK. The specific research question was:

- How were the challenges to resilience expressed by extension professionals in revisiting their TSK disaster management experience?

### **Methods**

A qualitative approach was used for this research. The sample for the study consisted of MALF extension professionals who worked through TSK and, at least, one other weather-related disaster. A snowball sampling method was used to recruit participants. Participants were contacted and interviewed electronically due to the COVID19 travel restrictions at the time. Respondents were asked to participate in a guided semi-structured interview, and submit concept maps and drawings two weeks after the interview. The interview collection process was conducted between February and May 2020, and the data were analyzed using the constant comparative technique (Glaser & Strauss, 2017). There were 13 participants in the study responding from various extension locations in Trinidad, and at various levels in the extension

hierarchy: two Extension Directors, ten Extension Officers, and one Agricultural Assistant. Concerning RQ1, participants were asked to respond to the question “Can you describe any mental, physical, or emotional stress in response to TSK?”

## **Results/Conclusions**

The major themes that came out of the analysis were “Vicarious Traumatization” and “Overlapping stresses in Disaster Response”. Vicarious traumatization was represented by the references the observed loss of clients’ livelihood and the clients’ responses to that. Overlapping stresses in disaster response as a theme contained categories such as perceptions about the natural environment post disaster, social anxiety in interacting with angry farmers, and managing work-related stresses in disaster response. All the respondents made references one or more of these categories.

Participant One stated “People take it for granted, but remember, some Extension officers work really closely with farmers. And to see people lose thousands of dollars or everything in some cases, and to know that that was the man’s livelihood. It’s heart-breaking, and not everybody deals with it the same way. Also, you feel helpless.” Participants Two, Three, Four, Nine, Ten, and Twelve also made similar references to vicarious traumatization, where codes of close client bonds, observing client loss, observing clients’ emotional responses to loss, helplessness, feeling personally impacted, and depression were recorded.

Regarding the overlapping stresses in disaster response, many of the respondents identified a general dislike for disaster response, citing the stresses of the activity. Participant 12 stated “...From the time you hear the phrase flood damage, it’s depressing. Nobody looks forward to that.” Many of the participants referenced the social anxieties in working with clients who incurred farm losses. Participants One, Six, Nine, Ten, Eleven, and Twelve provided details about being threatened by farmers because their disaster claims were not processed to their advantage. Several participants expressed being concerned about doing field visits, where the uncertainty about the changed landscape and the displacement of wildlife due to heavy rains can lead to unpredictable situations. Participant 7 commented on the amount of damage they witnessed, but also stated that seeing a significant amount of livestock death affected them. Finally, most of the participants mentioned work-related stress, where some categories included the inability to access necessary resources, lack of personal protective equipment, working long hours during response, and the unavailability of proper transportation. When asked about the support received from MALF, all respondents suggested that no further support was provided.

## **Recommendations/Application**

The themes that emerged from the current study overlapped with results from other disaster research generally (Gonzalez et al., 2019; West et al., 2008), and with extension professionals

responding to other disasters at other locations (Ali, 2019; Telg et al., 2008). Extension professionals in Trinidad manage weather-related disasters almost annually and presents an opportunity for input from the mental health industry to potentially improve resilience. Previous research called for more personnel and resources to assist disaster responders in the post-response phase to ensure that any long-term stresses are not incurred. The central idea behind much of the recommendation is to ensure resilient extension personnel and prevent human resource turnover. Further research can be conducted to introduce a mental health component for extension professionals when disaster management is complete. Additionally, the current research can be replicated to understand the impacts of disaster management of extension professionals in other contexts.

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**Training and Creating Meaningful Networks among Olive Oil Producers:  
Evidence from the Mediterranean Region**

**Authors**

**Kyriaki Zinoviadou<sup>a</sup>, Athanasios Gertsis<sup>a</sup>, Konstantinos Rotsios<sup>a</sup> \***

**<sup>a</sup> Perrotis College, American Farm School, Thessaloniki, 55102, Greece**

**[krotsi@afs.edu.gr](mailto:krotsi@afs.edu.gr)**

**\*Corresponding author**

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# **Training and Creating Meaningful Networks Among Olive Oil Producers: Evidence from the Mediterranean Region**

## **Introduction and Literature Review**

The agri-food sector is considered one of the most dynamic in Greece's economy. In recent years, it is often cited as one of the pillars for the country's exit from the current economic crisis and currently it contributes approximately 4% to the country's Gross Domestic Product (www.statista.com). The olive oil sector is very important to the country's economy. Approximately 133 million olive trees are found in the country, placing it in the third position of olive oil production and fifth in table olives production worldwide. Olive groves cover 60% of the country's cultivated land. The average olive oil production of the last six years has been 274,000 tones and approximately 54% is exported (ICAP group, 2020).

Despite the overall increase in food exports in recent years and the several quite successful examples of innovative farmers and companies, several challenges remain to be addressed for the sector to further develop and reach its full potential. Large quantities of olive oil are still traded in bulk without labeling. The result is that farmers receive relatively low prices for their high-quality product and processors from other countries reap the added value of the final and processed product. Like farmers in the Mediterranean region, Greek olive farmers are small and scattered, use traditional farming practices, depend heavily on family labor, and lack specific skills to address current production and quality challenges. Several of the small family olive orchards are unprofitable and many have been abandoned, resulting in higher unemployment rates within marginalized communities.

A major issue that hampers the sector's potential is the training of farmers. Despite several previous initiatives, the deficit in training of the farming community still prevails. Previous efforts with "fast-paced" training seminars on efficient use of inputs, business development, effective marketing and food promotion have not generated the expected results. As competition in the global markets increases drastically, the sector needs to improve its efficiency of production, better address current customer needs and preserve the natural resources. Today, changes in the behavior of farmers and food entrepreneurs require changes in their mentality. Training efforts require time, a specific methodology, different perspectives, and fields of knowledge, for a "holistic" approach.

## **Purpose and Objectives**

The purpose of the *Artolio* project is to preserve the cultivation of local varieties and support small artisanal production. Furthermore, the project aims to increase olive yield and oil quality, enhance profitability by connecting individual farmers from six participating countries (Israel, Palestine, Greece, Cyprus, Spain, and France), into a global network of resilient Mediterranean Small and Medium Enterprises (SMEs). Its general objective is to foster equitable and sustainable economic, social, and territorial development and advance cross-border integration. The strategy is based on (a) promoting economic and social development and (b) addressing common challenges in the environment. The project recognizes that the current value chain in the olive

sector is not in favor of small producers and aims to address this challenge. Its duration is 30 months, and the total budget is three million euros.

### **Methods/Data Sources**

Regarding methodology, a total of five farmers and two olive oil millers have been selected as beneficiaries in the Region of Central Macedonia, from many applicants (60 in total) to the open call. Their selection was based on specific criteria such as the means of irrigation used, size of the olive orchards, willingness to create their own brand and sustainability of their business. Despite their relatively young age, only half of the beneficiaries have attended seminars and relevant training.

Beneficiaries will be offered economic support, to purchase equipment in consultation with the team of experts. Financial motives are preferred by farmers and lead to change of agricultural practices (Bampa et al., 2019). Furthermore, they receive technical, agronomic, and business training as well as hands-on guidance. Similar practices to enhance agricultural entrepreneurship have been supported by the European Agricultural fund for Rural Development (Dobryagina, 2019). Overall, innovation and technology are crucial parts of the project. Additionally, a Pan-Mediterranean network will be created to facilitate knowledge exchange and assist SMEs in the Mediterranean basin in current marketing, sales, finance, policy, and legislation, at the national and international levels. This practice is critical for farmers' success (Velardi et al., 2021).

In addition to individual learning the project supports collective learning activities, through networking, cooperation, joint initiatives, and knowledge exchange. These practices enhance communication and facilitate change (Juárez-Carrillo, et al., 2017). The workshops and seminars will be open to other producers in addition to the project participants. Furthermore, regional institutions will be established to continuously provide participants with updated agronomic, technical, and business development knowledge. Additionally, a network will be created that will assist olive SMEs across the Mediterranean basin in marketing, sales, finance, policy, and legislation matters. A chain of regional entities will be established in the participating regions to provide local farmers and mills with updated information.

### **Anticipated Results and Conclusions**

It is expected that the above approach will result in changes in behavior and practices. Farmers will gain competencies to increase the profitability and the economic sustainability of their enterprises. The project will enable small producers to receive the added value they deserve and simultaneously enhance the preservation of local olive varieties that have been neglected.

### **Educational Importance and Application**

In conclusion, a major implication of the project is the training of beneficiaries that will lead to changes in mentality and practices, to address contemporary challenges of olive oil producers. The project is oriented towards a sustainable future development. It is holistic in its scope and sets the foundations of rural development and socio-economic growth. Lastly and most importantly, it promotes and encourages a culture

of synergies and collaboration among olive producers and SMEs from the participating countries.

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**The Neglect of Marginalized Farmers in the Innovation-Decision Process: Precision Agriculture Adoption Attributes for Smallholder Farmers**

Chin-Ling Lee  
Texas A&M University  
600 John Kimbrough Blvd  
College Station, TX 77843-2116  
cllee1261@tamu.edu

Robert Strong Jr.  
Texas A&M University

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## **Introduction and Theoretical Framework**

Precision agriculture (PA) adoption is a solution to food security (Mourhir et al., 2017). PA is a management strategy that enables farmers to use spatial and temporal data to improve production efficiency and quality, sustainability of agricultural practice, and cost minimization (Paustian & Theuvsen, 2017). However, some PA technologies were adopted fast, while others have lagged (Lowenberg-DeBoer & Erickson, 2019). PA adoption in marginalized smallholders is an important issue for global poverty reduction. The majority of the global small farms, if defined by land size, are in Asia and Africa (Lowder et al., 2014). They are the largest category of employment and small business group among the poor (Gatzweiler & Von Braun, 2016). However, poor people are willing to use and accept technologies that bring well-being (Rahman et al., 2017).

The lack of information is a barrier to adoption, and potential adopters can communicate with each other (Rogers, 2003, Strong, 2012; Wynn et al., 2013). The agricultural extension system plays an important role in providing PA information to producers. Kanter et al. (2019) reported adoption in smallholder farmer of PA technologies are due to the lack of extension services and information dissemination. Lee et al. (2021) found the absence of professional development for extension officers understanding of promoting PA adoption with farmers.

## **Purpose and Objectives**

The purpose of this study was to understand PA adoption strategies to assist agricultural extension systems develop strategies to improve PA smallholder farmer adoption. Specifically, the objectives were:

1. Identify the strategies for PA adoption by smallholder farmers.
2. Provide future research directions for agricultural extension systems to better provide strategies for PA adoption by smallholder farmers.

## **Methodology**

This study implemented a case study methodology to focus on a contemporary phenomenon in real life, in which boundaries between phenomenon and context are not clear (Yin 2009). This study analyzed the global search trends by using Google Trends with the search terms precision agriculture, smart agriculture, precision farming, smart farming, and climate-smart agriculture, and found that in the past 10 years, the search hotspots are in Asia and Africa, which are also the regions with the highest number of smallholder farmers in the world. Therefore, two studies, Xie et al. (2021), a seven-year study of smallholder farmers accessing and sharing the benefits of digital farming in China; and, Onyango et al. (2019), a study of PA practices to improve smallholder farmers' productivity using systematic reviews in Sub-Saharan Africa (SSA), are used as case studies in this study. To better depict the impact of PA on smallholder farmers globally, this study also incorporated Rotz et al.'s (2019) study on how to transform agricultural technologies in a way that supports the marginalized farmers in North America. Three studies found to be helpful in addressing question concerning the impact of PA on smallholders that requires more in-depth scholarly attention.

## **Result and Conclusions**



A lack of literature exists respective to marginalized smallholder farmer adoption of PA. There were three main categories of PA strategies used by smallholder farmers in both developed and developing countries gathered from the case study.

#### *PA information accessibility*

In developing countries, smallholder farmers received PA information indirectly. Formal and informal educational channels should be recognized and communicated to smallholder farmers to improve PA adoption (Kendall et al., 2021). Onyango et al. (2019) found there had been limited information on the use of PA offered to smallholder farmers in SSA. Besides, the government's recommendation on technologies does not recognize that there are differences between farms or regions. Xie et al. (2021) identified that PA information was not directly perceived by smallholder farmers; instead, they realized the use of PA by the outsourcing service. On the opposite, in the developed country like Canada, Rotz et al. (2019) indicated that smallholders could get PA information through the internet or PA providers directly. However, the problems smallholder farmers face was the increasingly economically oppressed by agri-tech companies, agri-food, and retail giants in the food system. This oppression may be exacerbated with the rise of agricultural data sharing.

#### *Production efficiency*

Xie et al. (2021) indicated that smallholder farmers could be involved in an organization (e.g., cooperatives) to increase their land operation efficiency in China. Onyango et al. (2019) summarized that smallholder farmers increased productivity by exploring local means and resources available to them in SSA. Establishing a local farmer organization seems to be a more practical solution for smallholder farmers in developing countries (Xie et al., 2021). In developed countries, the situation is just the opposite. Rotz et al. (2019) reported that many farmers sought to build and design equipment and sensor systems themselves through technologies because smallholder farmers would be able to control the end-product to reach the quality they preferred.

#### *Production cost reduction*

PA applications were targeted to lower production costs mainly on resources input (e.g., fertilizers) without considering labor costs in the developing countries. In contrast, PA technologies targeted overall costs included labor costs mainly in the developed country. Rotz et al. (2019) reported rising land costs had forced smallholder farmers to adopt technologies to reduce labor costs, especially displacing migrant laborers. PA smallholder farmers use of fertilizer applications was examined with Nigerian farmers (Jellason et al., 2021).

### **Recommendations and Educational Importance**

More global agricultural extension inquiries are needed to better understand smallholder farmer adoption of innovations to ensure they are not neglected in the innovation-decision process (Rogers, 2003). International agricultural extension practitioners should consider information accessibility, production efficiency, and production cost reduction adoption characteristics of smallholder farmers when developing PA technology promotion policies. Findings provide clarity that extension practitioners should be aware that there are various strategies can be used to deliver PA adoption to smallholder farmers, especially in the smallholder farmers of different context. Smallholder farmers are willing to adopt PA (Rahman et al., 2017), but need to acquire adequate information. To increase global food security under the multiplicity of changing climate and market variability requires the adoption of proven PA technologies to meet these extraordinary challenges (Olsovsky et al., 2021).

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**The Role of the International Cotton Trade in establishing the Penn School, the first School  
for Agricultural Education for African Americans in the United States**

Barry Croom, Ed.D  
University of Georgia  
2360 Rainwater Road  
Tifton, Georgia 31793  
Email: [dbcroom@uga.edu](mailto:dbcroom@uga.edu), Telephone: 1-229-3863116

Antoine Alston, Ph.D  
North Carolina A&T State University

Keywords: economy, African-American, schools, agriculture

## **Introduction**

Reconstruction in the United States (1865-1877) attempted to bring formerly enslaved people into full and equal membership in society (Chernow, 2018), in part by establishing schools offering vocational and academic instruction. But there is one notable exception – the Penn School on St. Helena Island near Beaufort, South Carolina, in 1862. The Penn School was established three years before the end of the American Civil War and the onset of Reconstruction. By South Carolina law, most African Americans were enslaved people during that period. How then does the Penn School, the first formal school for formerly enslaved people, come into being in a time and place where slavery was still an accepted social custom and economic factor?

The Penn School depended upon political, social, and economic elements to succeed. In 1862, United States armed forces had occupied Port Royal, South Carolina, including nearby St. Helena Island. This region of South Carolina was well suited for producing sea island cotton - a cotton variety of excellent quality and essential in the milling of cotton cloth (Porcher & Fick, 2010). Sea island cotton was a major commodity traded in international markets. If the United States could continue growing sea island cotton, it could revitalize global trade and help fund the war effort (Baptist, 2016; Beckert, 2014). But virtually no one in the Federal occupying force knew how to operate cotton farms. Plantation owners had abandoned coastal South Carolina, leaving their farms under the federal government's jurisdiction (Rose, 1999; Rosengarten, 1986). The formerly enslaved people in the region were the only ones remaining with cotton production experience. The United States Treasury Department created the Port Royal Experiment to solve the problem. The Port Royal Experiment provided wages, lodging, and subsistence farming for formerly enslaved people provided they grew cotton for international markets in the Northern Southern states (Rose, 1999).

## **Purpose and Objectives**

This study examined the historical events associated with the creation of the Penn School on St. Helena Island near Beaufort, South Carolina, in 1862 as a means to provide a contextual basis for understanding early efforts to provide agricultural education for African Americans. The specific objectives of this project were to:

1. Describe the effect of the world cotton economy on agricultural education at the school.
2. Describe the underlying foundational principles that provided the basis and structure for the school's instructional program.

## **Methods**

Gall, Borg, and Gall (2005) outlined procedures used in the historical research study. Primary sources of information include but are not limited to the personal correspondence, published manuscripts, diaries, and speeches of the first instructors at the school. Researchers examined the government records and reports related to the Port Royal Experiment. The Penn School papers, housed in the special collections Library at the University of North Carolina at Chapel Hill, were rich information about the school and its development. In addition, researchers visited the school site on St. Helena at the school and collected data from examinations of artifacts and buildings on the school grounds. Other sources were the records of slaveholders and plantation owners in the sea islands of South Carolina. The Beaufort County Library Archives in Beaufort, South Carolina, has a collection of diaries of plantation owners and citizens that provided information on the social norms and culture of the region for the antebellum and postbellum periods.

## **Results and Conclusions**

An education system grew out of the Port Royal Experiment that provided an early model of traditional agricultural education in the 1860s. Teachers and Christian missionaries, with support from Northern philanthropists, built the Penn School on St. Helena Island to provide both general and vocational education for formerly enslaved African Americans. The school program offered studies in English, mathematics, reading, and other academic subjects coupled with agricultural subjects focused on improving subsistence farming on St. Helena Island.

But the Penn School was constructed more for economic reasons than a desire to see African Americans thrive in post-civil war America. The Port Royal Experiment failed because formerly enslaved people could not replicate the successful production of cotton after the fall of the brutal regime of slavery (Baptist, 2016; Beckert, 2014; Beckert & Rockman, 2018; Hanson, 1979). With the failure of the Port Royal Experiment, federal support for the region declined.

After the failure of the Port Royal Experiment, the work of philanthropic organizations on St. Helena Island was hampered by inadequate sources of funding for schooling and diminished support for the development of subsistence farming on the island (L. M. Towne, personal communication, December 1, 1872; Towne, 2010). The development of upland (inland) cotton varieties diminished the need for sea island cotton as a major commodity. Transportation systems improved in the region, and the St. Helena Island population decreased as inhabitants sought jobs and better living conditions further inland. In 1948, the state school system assumed

responsibilities for all schools in the state, and the Penn School became the Penn Center, dedicated to civil rights efforts and cultural preservation.

### **Recommendations and Implications**

The researchers recommend that further research uncover the political and economic drivers associated with educational opportunities for underserved students. A clearer understanding of how political-economic models influence the development of career and technical education and agricultural education may provide education policy-makers with insight into insulating educational systems from the cyclical nature of politics and the economy.

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**Body-Mapping as a Pedagogical Technique for Identity Articulation within an  
International Agricultural Development Course**

[Oral Presentation Submission]

Catherine E. Sanders  
University of Georgia  
[catherine.dobbins@uga.edu](mailto:catherine.dobbins@uga.edu)  
450 College Station Rd., Four Towers 145B  
Athens, GA, 30602, USA

Allison F. Fortner  
University of Georgia

Alexa J. Lamm  
University of Georgia

**Keywords:** arts-based research; body-mapping; pedagogical strategies; semiotics; sociocultural identity

## **Introduction**

The need for interculturally competent professionals has risen significantly in a globalized economy, and higher education continually prioritizes intercultural competence development across disciplines (Andenoro et al., 2012). One of the primary barriers to effective cross-cultural communication is often a lack of self-awareness of one's own cultural identity (Bandura, 2011). Therefore, increasing self-awareness may be a successful entry-point for intercultural competence development (Andenoro et al., 2012); indicating a need for pedagogical strategies for learning about the self (Bandura, 2011; Bennett, 2012).

Body mapping is a visual methodology emphasizing participant awareness of embodied experiences related to identity, place, and belonging (de Jager et al., 2016; Vincent, 2014). Body mapping is well-suited to the study of sociocultural identity as it is socially constructed and focuses on recognition of difference, an essential meaning-making activity for sociocultural identity reflection (de Jager et al., 2016; Hall, 2021). The body mapping process supports and facilitates personal reflection related to meaning-making of one's lived experiences (Brett-MacLean, 2009). Arts-based methodologies have been used in international agricultural development research in the context of field work (Bjelland & Jones, 2001), service learning (Dobbins et al., 2020), and intercultural learning (Bost & Wingenbach, 2019). However, most studies used photographs for data collection, rather than participant-drawn images, which diversify the concepts to be elicited, as participants are not limited to capturing concrete images through photographs. The current study leverages body-mapping techniques to explore the pedagogical potential for examining the self within an intercultural development context.

## **Theoretical Framework**

Semiotic theory, the study of signs and a theory of the production and interpretation of meaning, informed the study (Chandler, 2007). Three types of semiotic signs exist: iconic, indexical, and symbolic, which each describe characteristics of an image (Lester, 2006). Iconic signs resemble what the image represents, requiring limited interpretation. Indexical signs have a logical connection with what the image represents and act as an indicator for a relationship between concepts (Chandler, 2007). Symbolic signs are abstract and do not have a logical connection with what the image represents. Unlike icons and indexical signs, symbols must be learned, which imposes a social and cultural influence on the artifacts (Chandler, 2007). Symbols are culturally and socially embedded and are passed through generations, requiring more contextual knowledge for interpretation than iconic or indexical signs. Several scholars have used semiotic theory for cultural and identity studies (e.g. Aiello, 2006; Andacht & Michel, 2005; Harrison, 2003). The current study advances the literature by using body-mapping as pedagogy for exploring participants' sociocultural identities.

## **Methods**

The purpose of this study was to use body-mapping as a method of articulating different aspects of the self as a component of intercultural competence development. Three research questions guided the study: 1) How do students make sense of their identity?; 2) How do students make sense of how others perceive their identity?; and 3) How do students define themselves in

relation to international agricultural development work? Participants, students of an International Agricultural Development (IAD) course, were given a prompt for each research question and asked to draw themselves and write a paragraph about each drawing. Data analysis occurred through a semiotic analysis of participants' drawn images and subsequent thematic analysis of the narrative component accompanying the drawings (Dobbins et al., 2020). The primary researcher memoed during the semiotic and narrative analysis process to serve in "making conceptual leaps from raw data to those abstractions that explain research phenomena in the context in which it is examined" (Birks et al., 2008, p. 68). Trustworthiness was maintained through member checks, peer debriefing, triangulation, and an audit trail (Lincoln & Guba, 1985).

## Results

Coding occurred using MAXQDA and yielded six themes. *Gender and sexuality* included components of gender identity and membership within LGBTQIA+ communities. *Family and social self* depicted the importance of social ties on identity development, specifically from the role of family. *Heritage* emphasized the importance of nationality and ethnic heritage for participants, especially those whose family immigrated to the United States. *Self as academic* was prominent in how students navigated their potential role in IAD as well as how academic identity motivated them internally and influenced external perceptions from others. *Competing tensions within identity* explored the tensions between internal and external identity perceptions that impacted behavior, as well as tensions emerging from competing expectations from one's social groups and personal motivations. Finally, the *impact of categorization on identity* described how achieved or ascribed roles affected how others perceive the participants as well as how the participants perceived themselves.

Examining both the semiotic and narrative components revealed a high convergence between analyses. The narrative analysis expanded the semiotic analysis, especially for students whose drawings only contained a few icons. However, some semiotic analysis identified potential tensions within students' identities they alluded to but may not have explicitly stated. These included tensions between competing parts of one's identity, often manifested through a comparison of self-identity versus how others perceived them. The semiotic analysis expanded narrative explanations by identifying the symbolic power of icons for meaning-making within identity construction.

## Recommendations, Educational Importance, & Implications

The confluence of semiotic and thematic analysis allowed researchers to investigate how students construct the story of the self in relation to IAD. Data triangulation of narrative and semiotic analysis revealed convergences and divergences between icons used to construct the self and the narrative interpretations of the self. While primary meaning-making occurred through narratives, selecting icons for identity depiction was a reflective process which prompted students to articulate the self in relation to sociocultural identity, a core competency for the course.

When educating for intercultural competence development, strategies for helping students conceptualize their identities are crucial. Cultural self-awareness and knowledge of the self are essential for intercultural competence and for communicating in cross-cultural contexts (Bandura, 2011). Because the body-mapping exercise occurred near the conclusion of the course, students may have gained skills throughout the course to articulate their identities through both body mapping and reflective narratives. Future studies may benefit from comparing how students make sense of their identity using body-mapping at the launch and conclusion of a course.

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**Teachers' Perceptions of Pedagogical Change through the INGO Field of Hope's**

**Introduction of an Agricultural Education Curriculum in Uganda:**

**A Mixed Methods Case Study**

**Authors**

**Robin Shuffett, M.S.**

robin.shuffett@okstate.edu

Oklahoma State University

**M. Craig Edwards, Ph.D.**

Oklahoma State University

**Keywords:** agricultural education curriculum; student-centric learning; teacher development

**Teachers' Perceptions of Pedagogical Change through the INGO Field of Hope's  
Introduction of an Agricultural Education Curriculum in Uganda:**

**A Mixed Methods Case Study**

**Introduction/Theoretical Framework**

Negative stereotypes portraying farming as a second-rate occupation have fomented disinterest by many school-aged youth, as has the use of agriculture as a form of student punishment in some schools (Mouvement International de la Jeunesse Agricole et Rurale Catholique, International Fund for Agricultural Development, & FAO, 2012). However, educational reform for teaching agriculture in Uganda's secondary schools is a goal that coincided with the introduction of a new curriculum for lower secondary grades in 2020 (Mutesi, 2020) by the international non-governmental organization (INGO) Field of Hope (FoH).

People under the age of 30 constitute approximately 77% of Uganda's population (Ahaibwe et al., 2013), and its agriculture sector employs about 72% of the working population (Trading Economics, 2020). Even though much of the agricultural productivity is subsistence and smallholder farming, knowledge of modern practices and technologies through secondary education is essential to the sector's growth, sustainable development, and ensuring the nation's food security.

Uganda's secondary agricultural education should provide practical experiences for youth so they can acquire useful knowledge and positive attitudes while building related technical skills (Barungi et al., 2016; Mukembo, 2017; Mukembo et al., 2014). Initiatives from national bodies have been supported by international and donor agencies to catalyze pedagogical change that transforms agricultural theory into practical applications. This study features the programming initiatives of the U.S.-based INGO, FoH, which released an agricultural education

curriculum for lower secondary grades S1-S4 to operate in concert with Uganda's national education curriculum (Cannon, 2019; Major, 2018). We examined the survey questionnaire responses of secondary school teachers new to FoH's curriculum who attended their professional development workshop for the first time in January 2020.

To analyze and describe the teachers' perceptions of pedagogical change and its adoption, the researcher employed Rogers' (2003) diffusion of innovations model as the study's theoretical framework. Rogers (2003) presented five attributes associated with the likelihood of adopting an innovative technology or practice: relative advantage, compatibility, complexity, observability, and trialability. Through this lens, the likelihood of the secondary school teachers adopting FoH's curriculum was interpreted by qualitatively and quantitatively analyzing their perspectives of the learning resources and the related training workshop.

We also employed Rogan's and Grayson's (2003) framework for curriculum implementation in developing nations. Rogan and Grayson (2003) featured three guiding principles for successful curriculum implementation: profile of implementation, capacity to support innovation, and support from outside agencies.

### **Purpose/Objectives**

This study's purpose was to describe the perceptions of Ugandan secondary school educators regarding FoH's agricultural curricula, including the teaching methods embedded in its design that they found valuable, and influence the related professional development had on their attitudes about teaching agriculture and on their teaching practices overall. This portion of a larger study was guided by two objectives: 1. Describe the teachers' perceived value of the FoH curriculum to their teaching practices; and 2. Identify ways to improve the FoH curriculum as perceived by teachers who participated in the training workshop.



## **Methodology/Data Sources**

The study's data were made available to the researcher during her virtual internship with FoH in which she was given the task of entering data into a Microsoft Excel workbook. The data had not been analyzed prior to this study. The investigation employed the critical case sampling method. Through a sorting variable, the responses of 56 teachers were selected of the 91 respondents to the questionnaire. These teachers were purposefully selected based on having had neither prior exposure to FoH's curriculum nor previous experience with their trainings (Johnson & Christensen, 2017).

We used mixed methods to analyze the responses. Word frequencies from the teachers' narrative comments were coded and, in some cases, quantified, and descriptive statistics were used to analyze responses to the Likert-type items. The data were organized and analyzed using functions in Microsoft Excel and NVIVO.

## **Selected Results**

Ranking first among code frequencies were the practical aspects of FoH's curriculum which the teachers found valuable, i.e., their perceptions of its relative advantage (Rogers, 2003). The responses revealed that teachers preferred the student-centric, practical, hands-on teaching methods to theoretical, lecture-based approaches. Ranking second were the teachers' views that the curriculum was highly comprehensible or easy to understand and use, which supports Rogers' (2003) assertion regarding the importance of potential adopters perceiving an innovation's compatibility with their existing practice. However, nearly one-half of the teachers expressed concerns about the limited class time allocations for teaching agriculture as insufficient to teach all lessons provided by FoH. This could reduce teachers' perceptions of the curriculum's compatibility as well as heighten their concerns with complexity (Rogers, 2003)

regarding its implementation. Resources for teaching were also described as a limitation, further denoting compatibility and complexity issues, due to scarce funding for learning materials and large class sizes. Even though three-fourths of the teachers affirmed having school gardens, demonstration garden, or access to animals, some expressed that the condition and scarcity of these resources limited their teaching practices which may lessen their implementation of the FoH curriculum. These concerns, if interpreted through Rogan's and Grayson's (2003) framework of curriculum reform and implementation in lesser-developed nations, are worthy of additional research and consideration.

### **Conclusions, Educational Importance, Implications, and Recommendations**

The findings indicated mostly positive teacher attitudes regarding FoH's curriculum and related professional development workshop, as well as a desire for continuous training by the teachers. These findings also supported previous studies done on FoH's curriculum and teacher training workshops (Cannon, 2019; Thurmond, 2019), and further validated such by this study's sample of teachers new to both. Based on the teachers' critique of the curriculum and their challenges to the likelihood of implementation, we recommend exploring ways to condense its content to address concerns regarding time constraints and to consider approaches to make its use less resource-intensive. This should improve its compatibility and reduce perceptions of complexity. Expanding FoH's services to include professional development for school administrators may facilitate more support for and greater understanding of agriculture as an important part of the curriculum, and a productive livelihood option for students to pursue and/or study at the post-secondary level.

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**Process Skills and Competency Gaps in Undergraduate Agricultural Extension  
Curriculum in South Asia – Implication for Policy Decisions**

Murari Suvedi, Professor

Michigan State University, USA

suvedi@msu.edu

and

P.V.K.Sasidhar, Professor

Indira Gandhi National Open University, India

pvksasidhar@ignou.ac.in

*Keywords:* Extension curriculum, core competencies, process skills, competency gaps

## **Introduction / Theoretical Framework**

The agricultural sector remains a chief economic component in South Asia. It employs over 60% of the labor force. Agricultural development is the major means to alleviate poverty and curtail food insecurity. Agricultural extension services play a key role in addressing this challenge. The technical knowledge and process skills of extension workers influence the quality of extension services, and the undergraduate curriculum impacts job skills of extension workers.

The role of agricultural training institutions is vital in human resources development for agricultural development. However, they have been slow to change. During their establishment, the training content, or the subject matter, was borrowed from the British or American universities, and learning methods and materials are often outdated and inadequate. Most teaching in agricultural education in South Asia consists of presentations of theory and facts and training focuses on technical skills. Students have little opportunity to develop core competencies, critical thinking and problem-solving skills.

To carry out the new roles, extension professionals need different types of skills, attitude and working patterns. Ultimately, this has tremendous implications for pre-service training in agricultural extension education. To perform their extension roles effectively, they need basic educators' process skills and competencies, which are known as core competencies.

### **Purpose and Objectives**

The overarching purpose of this study was to assess agricultural extension curricula at the undergraduate level currently followed in three South Asian countries namely India, Sri Lanka and Nepal. The specific research questions were:

1. 1. What are the critical job skills and core competencies required of extension workers to effectively plan, implement, and evaluate extension work in today's changing

context?

2. 2. Does the current UG curriculum in extension education include education and/or training on these job skills or core competencies?
3. 3. What are the barriers to effectively training extension workers with required core competencies, and how can these barriers be removed?

### **Methods**

The study was undertaken in three South Asian countries: India, Sri Lanka, and Nepal during August 2019 to May 2020. An online survey was conducted for collecting data from extension professionals, including directors of extension, extension department heads, extension faculty members, extension researchers, subject matter specialists working in farm science centers and public sector extension field functionaries working in agriculture and allied sectors, employers and extension graduates working for NGOs and/or private sector companies, and extension PG and Ph.D. students. A total of 628 completed the online survey -- 424 from India, 119 from Sri Lanka, and 85 from Nepal were received for analysis.

### **Results**

The demographics of agricultural extension professionals in India, Sri Lanka, and Nepal were comparable except for gender representation. The process skills competencies -- needs assessment and program planning, implementation and evaluation; communication and ICTs; personal and professional development; diversity and gender skills were identified as basic extension skills. In the present study, the mean scores on the level of importance of all eight process skills and core competencies of agricultural extension professionals in India, Sri Lanka, and Nepal were higher than the corresponding mean scores on their level of coverage in the UG curriculum.

## Recommendations

Despite high enrollment of women in agricultural colleges and universities, study results showed a very low representation of women among extension professionals in India and Nepal. It is imperative that agricultural extension systems recruit female professionals to help reach underserved audiences. Recruiting and retaining more *women extension professionals will help in bridging the gender gap, planning gender-specific extension programs, to meet the needs of women clients.*

The findings revealed significant differences between the level of importance and the level of coverage in UG courses of all eight process skills and core competencies of agricultural extension professionals. Further analysis of existing curricula revealed that many of these skills and competencies are included in various UG agricultural extension courses. *This leads to the conclusion that, though the process skills and competencies are incorporated in the curriculum, the content is minimally covered, and the level of required curriculum transaction and pre-service training at the UG level is inadequate.* Therefore, the core issue of concern is the recognition that the implementation of the curriculum is weak and does not prepare students with the required skills and competencies for quality extension work.

Our analysis reveals that the UG curriculum in India introduces concepts and principles of entrepreneurship development, which are less prominent in Nepal and Sri Lanka. Gender and ethnicity issues are well covered in the Nepalese curriculum but are lacking in the curricula of India and Sri Lanka. Similarly, Sri Lanka has very well integrated agribusiness management concepts and principles in the agricultural extension specialization, but they are lacking in India and Nepal.” Because foundational concepts and principles of extension education come from diverse social science disciplines such as adult education, rural sociology, development



communication, economics, psychology, anthropology, management, and development studies agricultural extension curricula of the new century should be enhanced through the integration of various social science courses and faculties.

The roles and responsibilities of agricultural extension workers are changing. Extension services are gradually becoming decentralized, demand-driven, and participatory, and following a pluralistic service delivery model. This scenario explains the changing role of the extension worker and the greater need to focus on building pluralism in extension service. In this context, pre-service education and training should prepare them to perform the following roles and functions:

- They must be able to practice participatory, demand-driven extension programs for local communities. They should be able to serve as educators, communicators, community organizers, and facilitators of change.
- They should function as networkers and a link between agricultural researchers, policymakers, farm service providers, and farming communities.
- They can organize farm producers into groups and associations for linking farmers to markets, identifying opportunities, and conducting market analyses.
- They promote gender equality and engage various marginalized groups in extension programs.
- They serve as local change agents to address emerging issues such as adaptation to climate change, promotion of renewable energy, gender integration in development programs, and attracting youth to farming as a vocation.

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## **Dynamic Model of Food Heritage and Preservation: Analyzing culture in global foodways**

Barbara Worley  
University of Georgia  
405 College Station Rd.  
Athens, GA 30602  
[bworley@uga.edu](mailto:bworley@uga.edu)

Abigail Borron  
University of Georgia

Key Words: conceptual framework, innovations, culture, heritage, foodways

## Introduction

Food is a performative and symbolic way of expressing identity in a culture (Holtzman, 2006). As a representation of identity, food culture (or foodways), evolve as a result of what is naturally accessible and produced (Jacobsen, 2004). Further, the cultural role of food within foodways is associated with community members' perceptions and acceptability (Lefler, 2007).

As the global food crisis reaches critical juncture (FAO, 2021), an increase in agricultural innovations to mitigate scarcity has prompted university researchers and educators to engage community-based partners and opinion leaders in deployment strategies for increasing availability (Oleas et al., 2010; Strong & Harder, 2011). However, post-humanistic advancements in agriculture across scientific areas of inquiry, created traditionally by natural scientists and disseminated through the work of social scientists, still brandish a disconnect in accounting for behavior change (Braidotti, 2013; Masambuka-Kanchewa et al., 2020). As a result, a paradox and imbalance exist among food movements, agricultural knowledge, and marginalized communities around the world (Giménez & Shattuck, 2011).

While environmental and social impacts of agricultural innovations have been studied in tandem (De Olde & Valentinov, 2019; Swanson, 2006), a gap exists in understanding the cultural and heritage implications of modernization. Thus, the authors contend there is a missing link between communicating and adoption of food-based innovations, specifically in a cultural context, potentially hindering the diffusion process.

## Purpose and Objectives

This presentation introduces a conceptual framework that is based on three dynamic constructs: heritage, practice, and power. Referred to as the *Dynamic Model of Food Heritage and Preservation* (FHP), this framework methodologically integrates critical discourse analysis to emphasize the relationship between adoption (of agricultural innovation) and preservation (of food culture and heritage). By situating agricultural innovations into each construct, a discursive space of preservation can be formed to bring forth awareness of cultural benefits, notwithstanding previous community acceptance and adoption in relation to their food culture and heritage. The application of FHP provides the foundation for introducing innovations through potential modalities such as Extension in an international context for understanding food culture and heritage. Therefore, the objectives for this conceptual framework are to:

1. Demonstrate the applicability and essentiality of the three FHP constructs in relation to agricultural innovation.
2. Examine the relationship between creators and disseminators of agricultural innovations and local food culture and heritage.

## Theoretical themes

In the formation of a discursive space around food heritage preservation, an analysis of foodways must consider the complexities associated with the formation of cultural identities in the past, present, and future. Developed from an ontology and epistemology of historical realism

and subjectivism in a critical postcolonial perspective, this framework serves to challenge dominant structures and ideologies that have led to an alterity of food culture and a disruption in the purity of foundational heritage.

Thus, the FHP will guide future research in relation to these paradigmatic perspectives. The framework is comprised of three dynamic constructs: heritage (the origin of cuisine and the manifestation of foodways), practice (the representation and interpretation), and power (the performative and evocative nature). While these constructs have been addressed separately in the literature, an absence exists in an explicit analysis of the transmuting, often contested, dialectical relationship with each other.

A synthesis of theories has informed the development of this conceptual framework. The Culture Centered Approach (Dutta, 2008) guides the framework as it relates to creating new discursive spaces among marginalized or subaltern groups, creating a structural space for the demonstration of agency among community members. Cultural Identity Theory situates the framework in a communications and multicultural position in relation to these theoretical perspectives (Collier & Thomas, 1988). Finally, Diffusion of Innovations (Rogers, 2003) is used to guide this framework as it relates to the perceived attributes of an innovation, coupled with personal characteristics of the individual, resulting in the impact of its adoption. Collectively, they examine the preservation of cultural foodways through the application of a specific innovative food commodity to understanding the relationship and tensions that exist among heritage, power, and practice.

Methodologically, the interconnectivity between innovation and foodways can be determined using Critical Discourse Analysis through Discourse Historical Approach (DHA) and Dialectical Relational Approach (DRA) (Reisigl & Wodak, 2016; Fairclough, 2016). The use of DHA provides pathways to link historic causation with suggested outcomes through analysis of literature and archives. Situating DHA in each FHP construct enables an analysis of how the phenomena of food heritage preservation has been historically examined, and identifying discursive spaces. The use of DRA examines contemporary participant discourse created around the semiotics of food culture (Fairclough, 2016). A comparative analysis between DHA and DRA thereby determines the implications of using these approaches to support and inform the conceptual framework in the creation of a formative discursive space of food heritage preservation and adoption of innovations through increased cultural consciousness.

## **Conclusion & Implications**

By analyzing the contested intersections that exist between, and within, the constructs of heritage, power, and practice, an examination of how each aspect is sustained in the dialectic can be assumed to create a discursive space. The result is a means to critique what has been misunderstood in the relationship between innovation and adoption from a cultural perspective. Garnering an understanding of the tensions between and within each aspect of the conceptual framework will allow for application of the modeled concept to analysis of food heritage in a global context.



As we operate within a structure of a corporate food regime with advancements in products and processes, we must concern ourselves with whether we are failing to account for preservation of heritage or if therein lies the dialectic in preserving heritage and fostering global development (Giménez & Shattuck, 2011). Innovations developed for reducing vitamin-A deficiency, such as orange fleshed sweet potatoes and orange corn resulted in less than optimal adoption rates due to community perception and cultural unfamiliarity (Adekambi et al., 2020; Purdue University, 2019). As innovations are examined through each of the constructs within the conceptual framework, the merging of creator, disseminator, and adopter becomes fluid, thereby centering, restoring, or sustaining community agency.

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**Innovative Solutions for Food Systems Issues: A Framework for Applying Systems  
Thinking and Adaptive Leadership**

**Authors**

Dr. Jera Niewoehner

Elizondo Green

Dr. Mary T. Rodriguez

Jaelene Loor Suche

Kameron Rinehart

## Introduction

In 2020, it was estimated that between 720 and 811 million people in the world faced hunger, an increase of 320 million in one year (FAO et al., 2021). COVID-19 greatly increased household vulnerability due to illness, job loss, disruptions in the food system, and other challenges. To build resilient communities we need to further understand the complexity of the food system. Food systems are considered a social-ecological system comprised of activities such as food production, processing and packaging, distribution/retail, and consumption (Berkes et al, 2003; Eriksen, 2008). Issues related to this system include the governance and economics of food production, food waste, sustainability, the effect of food production on the natural environment, and the impact of food on individual and population health (University of Oxford, n.d.).

A ‘good food system’ is a just, equitable, and sustainable food system that provides physical, economic, and community health; regenerates, protects, and respects natural resources and animals; and ensures that all people live with dignity and freedom from oppression and exploitation (Good Food for All Collaborative, n.d.). Both locally and internationally, we have not met the criteria for a ‘good food system’ as marginalized populations including Black, Indigenous and People of Color (BIPOC) and low-income households continue to disproportionality experience changes in this system.

As a complex and ever-changing system, creative and innovative solutions are needed to address deep-rooted inequalities and issues in the food system. Therefore, we propose a conceptual framework to guide the identification of and engagement in food systems issues for extension practitioners based on systems thinking and adaptive leadership.

## Review of Literature

*Technical* problems have a clear solution in which individuals with expertise can easily offer fixes (Heifetz, 2010). However, when problems require learning, are complex, and involve changes to people’s priorities, beliefs, and habits, they are considered *adaptive* challenges (Heifetz et al., 2009; Heifetz, 2010). Food system issues are complex in nature, thus require both systems thinking and adaptive leadership to address.

Systems thinking considers the interconnected and dynamic nature of various systems affecting a specific problem or phenomenon (Rosas, 2017). A system is something more than the collection of its parts; it has elements or characteristics, interconnections, and a purpose (Meadows, 2008). In practice, the systems thinking approach is a useful tool to elevate the level of power that people have in issues related to food security (Washington, 2016), especially in rural communities (Moore et al., 2019). As an example, application of this approach systems thinking in the Philippines indicated that the main threats to food security and fisheries were the interactions between environmental, socioecological, and economic drivers (King et al., 2017). Likewise, using a combination of systems thinking and the Bayesian Belief Network Models approach enabled the development of four different models for agribusiness sustainability in Ghana (Banson et al., 2013).

Several behaviors necessary for addressing complex issues are included in the adaptive leadership model. Adaptive leadership is defined as “the activity of mobilizing people to tackle the toughest problems and do the adaptive work necessary to achieve progress” (Heifetz et al., 2004). Through adaptive leadership behaviors, one can identify solutions through observing events and patterns, engaging with people closest to the problem within the system and developing interventions to address the problem (Heifetz, 2009; Nelson & Squires, 2017).

### **Purpose and Objectives**

Drawing from a conceptual framework for developing innovative solutions to adaptive challenges in dietetics practice (Herman et al., 2021), we aim to develop a framework for extension research and practice related to food systems issues. The purpose of the conceptual framework is to provide guidelines for addressing food systems issues utilizing systems thinking and adaptive leadership. For problem-solving in this context, systems thinking will drive the process and adaptive leadership will drive the behaviors.

### **Methods**

Authors reviewed the literature related to the application of systems thinking to address complex adaptive problems related to agriculture, sustainability, natural resources, and food security. Authors have also been formally trained in systems thinking and adaptive leadership and drew upon their knowledge of these approaches to develop the framework.

### **Product: Framework for Applying Systems Thinking and Adaptive Leadership**

The proposed framework demonstrates how a practitioner can apply systems thinking and adaptive leadership to addressing a complex issue like food insecurity. There are three phases: I. Identifying influential factors; II. Formulating solutions; and III. Evaluating impact. Throughout each phase, adaptive leadership behaviors can be used to build relationships, develop effective collaborations, stay focused on the work, and include multiple, sometimes contradictory, perspectives.

*Phase I:* Practitioners utilize their knowledge of complex adaptive challenges to identify the social, political, economic, and cultural factors that impact food systems and the issues within them. This phase will employ systems thinking tools such as understanding through synthesis, describing feedback loops, and identifying causality (Kim, 1999; Meadows, 2008).

*Phase II:* Once factors have been identified, practitioners begin to develop strategies. The goal in this phase is to create sustainable and transformative effects which will likely require collaborations across different disciplines such as family and nutrition sciences, community development, and others. Systems thinking is employed in this phase to describe how strategies and proposed solutions could affect multiple dimensions of the factors identified in Phase I.

*Phase III:* The practitioners plan how to evaluate the potential impacts of the proposed solutions. The impacts should be evaluated at varying levels of the system such as the household, community, policy, and population. Systems thinking is utilized in this phase as a lens to acknowledge how changes at each level can have synergistic effects on the entire food system.

## Recommendations and Application

The FAO et al. (2021) has called for bold and transformative actions to mitigate the long-term effects of COVID-19 on food insecurity in the world. Extension practitioners can use this framework to develop programming, outreach efforts, and solutions aimed to create systemic and transformational change. The use of adaptive leadership and systems thinking challenges traditional development efforts and brings an innovative approach to addressing complex issues facing the food system around the world.

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**Advantages and Foundational Issues Associated with Using Structural Equation Modeling (SEM) in International Agricultural Education Research**

**Kristin E. Gibson**

University of Georgia  
145B Four Towers Building  
Athens, GA 30602  
kristin.gibson@uga.edu

**Millicent A. Oyugi**

University of Georgia

**Alexa J. Lamm**

University of Georgia

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## **Introduction**

International agricultural education researchers are often interested in predicting motivations behind behavioral engagement of an individual or group. Structural equation modeling (SEM) allows researchers to test hypotheses regarding the relationship between manifest and latent variables (Hoyle, 1995). SEM has become a popular data analysis technique among researchers (Kline, 2011), especially in relation to sustainability issues like those found in agricultural contexts (Mardani et al., 2017). Latent variables, which are unobserved and therefore not directly measured (Blunch, 2008), are often the variables of interest. Manifest variables, which are observed and can be measured, are used to measure latent variables (Blunch, 2008). For example, the theory of planned behavior (TPB) has been used to predict farmers' water conservation behavioral intentions (e.g., Mahdavi, 2021). The most basic TPB model has five latent variables: attitude, subjective norms, perceived behavioral control, intention, and behavior; that are all measured by some number of manifest variables (Ajzen, 1991).

## **Background**

Numerous international agricultural education studies have used SEM as their methodology. For example, Luu et al. (2019) used a SEM guided by protection motivation theory to explore climate change adaption intention of farmers in Vietnam. Mahdavi (2021) used a SEM guided by TPB to determine native farmers' support for policy to reduce agricultural water use. Lamm et al. (2020) used a SEM to test the combination of the diffusion of innovations theory with the spiral of silence theory in the context of attitudes towards genetic modification foods.

Guidelines and practice for SEM are generally presented in research in the broader field of psychology (e.g., MacCallum & Austin, 2000; Tomarken & Waller, 2005). Few studies in the context of international agricultural education have elaborated on the advantages and foundational measurement issues related to SEM. Without acknowledging inherent SEM issues, international agricultural education researchers may misinterpret SEM and the implications resulting from the analysis. Therefore, the purpose of this methodological study was to determine the advantages and measurement issues associated with using SEM in international agricultural education research by conducting a thorough analysis of the literature and applying it to the international agricultural education research context. Advantages and measurement issues were determined with the guidance of Kline (2011).

## **Advantages**

Using SEM has many advantages (Kline, 2011). SEM is flexible and allows researchers to develop complex models. In SEM, the researcher can create a model by using a system of regression equations rather than a single simple or multiple linear regression. SEM allows researchers to develop complex models that measure direct and indirect effects, which is more powerful than only measuring direct effects per regression models (Kline, 2011).

Smith et al. (2014) argued that SEM provides a critical framework for multidisciplinary research teams who are addressing grand challenges, like agriculture and climate change. Specifically, SEM provides "a common frame across disciplines, facilitating constant refinement of hypotheses and methods, and promoting discovery of new questions and relationships," which may help bridge multiple disciplines working on a common project in agriculture.

## Measurement Issues

There are numerous measurement issues associated with SEM that researchers often overlook, such as model fit indices, correlation versus covariance matrices, and sample size (Kline, 2011). A noted limitation is that this is by no means an exhaustive list of measurement issues when using SEM but rather a starting point for common mistakes.

### *Model fit indices*

SEM analyses should test a theory rather than find a model that fits the data (Kline, 2011). Model fit can be maximized by introducing additional paths and error but it may not make sense theoretically (Nachtigall et al., 2003). Moreover, there are numerous model fit indices that should be examined and considered when evaluating a hypothesized model, including Chi-square, Goodness-of-Fit Index, Adjusted Goodness-of-Fit Indices, Comparative Fit Index, Standardized Root Mean Squared Residual, root mean square residual, and Root Mean Square Error of Approximation (Carvalho & Chima, 2014). However, there is a debate in SEM literature as to the best strategies for assessing model fit. Some researchers ignore chi-square altogether while others frequently use it for assessing goodness of fit. Not using chi-square completely is considered bad practice (Kline, 2011), but it should not be used alone due to its sensitivity to sample size (Carvalho & Chima, 2014).

### *Correlation versus Covariance Matrices*

SEM theory pertains to covariance matrices (Cudeck, 1989). Yet, many studies use the correlation matrix instead or do not specify the matrix used (Tomarken & Waller, 2005). Generally, there are inaccurate standard errors of parameter estimates when a correlation matrix is analyzed in SEM (Tomarken & Waller, 2005).

### *Sample Size*

SEM requires a large sample size (Kline, 2011) that may not always be feasible in international agricultural education research. Estimation problems and unreliable results are likely to occur if there are less than 10 observations per variable of interest (Carvalho & Chima, 2014). However, there is no standard minimum sample size for SEM but rather a five to 10 times the number of indicators rule of thumb.

Additional points of interest include using theory appropriately, unreliability, and model specification (Kline, 2011). It should be noted that there are also reporting issues associated with SEM that are often not mutually exclusive from measurement issues. For example, MacCallum and Austin (2000) reviewed 16 different psychology journals for their SEM applications and found problems with reporting parameter estimates, insufficient descriptions of data matrices, and insufficient descriptions of models or variables.

## Discussion

Based on its ability to look deeper into the direct and indirect effects of variables on the dependent variable, international agricultural education researchers should capitalize on the strengths of SEM. However, in order to do so correctly, professional development opportunities related to the use of SEM offered through professional organizations, such as the Association of International Agricultural and Extension Education, may assist research teams in using SEM correctly and the implications of their associated findings. Future studies should assess

international agricultural education researchers' self-efficacy using SEM. A meta-synthesis examining publications using SEM within the field of international agricultural education, including how the methodology was used, would further elucidate its correct application within the field.

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# **Climate-smart Agriculture: Perception of Smallholder Cocoa Farmers in Ghana**

**Akua Adu-Gyamfi**

Agricultural Education Program

Department of Curriculum and Teaching

5032 Haley center, Auburn University, 36849-5218

Email: [aza0043@auburn.edu](mailto:aza0043@auburn.edu)

**Jason McKibben**

Auburn University

**Christopher Clemons**

Auburn University

**James Lindner**

Auburn University

Keywords: Climate-smart Practices, Eastern Region, Barriers, Climate Change, Adoption

## **Introduction**

[Country] is the second-largest cocoa-producing nation behind [nation]. Around 800,000 smallholder cocoa farmers in [country] earn between 70 and 100 percent of their income from cocoa production alone (Anim-Kwapong & Frimpong, 2008). The cocoa industry employs 3.2 million people along its entire production chain and it generates 25% of foreign currency earnings (Ameyaw et al., 2018). Farmers remain exposed to climate change due to insufficient adaptive capacity, despite the cocoa industry providing many benefits to smallholder farmers. Recurrent drought, overdependence on rainfall, widespread poverty, and high temperatures continue to affect smallholder farmers in [country] (Adimassu & Kessler, 2016). Food security, bean quality, and cocoa yield have been negatively affected as a result. Climate-smart agriculture (CSA) practices are recognized as the most appropriate adaptation strategies to achieve greater resilience to risk, increase agricultural productivity, food security, and stability to climate variability. Climate-smart agriculture is an approach that involves transitioning to efficient agricultural production methods that enable increased productivity and input application. These practices provide a triple win approach because they increase agricultural productivity, increase resilience and reduce greenhouse gases that cause climate change (FAO, 2013).

## **Purpose and Objectives**

The purpose of this project was to enhance small-scale [country] cocoa farmers' adoption of climate-smart practices that will enable them to adapt to climate change and increase productivity. The objectives of the project were:

1. To evaluate cocoa farmers' perception of climate change
2. To examine cocoa farmers' knowledge of climate-smart agriculture
3. To examine potential barriers to adopting climate-smart agricultural practices

## **Methods**

The study was conducted in the eastern part of [country]. The eastern part of the [country] is one of the major cocoa-producing regions. Cocoa production serves as the main source of livelihood for members in the [country]. Participants were smallholder cocoa farmers who were 18 years old or older. Cocoa farmers were randomly sampled and interviewed using a structured survey instrument. The survey instrument consisted of primarily closed-ended and Likert scale questions. Data were analyzed using Excel and SPSS. Descriptive statistics were used to present information on socioeconomic characteristics, perception of cocoa farmers to climate change, farmers' knowledge on climate-smart agriculture, and barriers to the adoption of climate-smart practices in cocoa production.

## **Results and Conclusion**

The study participants were all adults (>18 years), mostly between 45–59 years; 70% were male and 30% female, a proportion epitomizing cocoa farming as a predominantly male-dominated activity. Most of the respondents attained basic education (70%), were married (65%), and were farming on lands they received as an inheritance (30%). Ninety-five percent of the respondents have access to extension advisory services and received extension visitation at least once or twice a week. About 80% of the farmers have been to workshops on climate-smart practices and have received.



Most farmers perceived changes in climatic patterns over the last ten years. Notably, farmers perceive rising temperature (80% of farmers) and a reduction in the amount of rainfall (60% of farmers). Within the same period, the length of the wet season stayed about the same (55% of farmers), with a resultant increase in dry spells (70% of farmers). Seventy percent of farmers agreed that experienced climatic changes over the past decade have negatively impacted cocoa yields. The mean for the perception of climate change was 4.37, which implied that most farmers strongly agreed and somewhat agreed that climate change impacts cocoa production negatively. The mean value for knowledge on climate-smart agriculture (CSA) was 4.38, which meant most participants were knowledgeable on CSA practices. They strongly agreed and somewhat agreed that climate-smart agriculture will impact their farm positively, and they had a positive attitude to adopt climate-smart cocoa practices with a mean of 4.19. Their attitude toward barriers to adoption of CSA practices was negative as they had a mean of 2.42. Although most of the participants stated that lack of finances and credit facilities were their main barriers to adopting CSA practices. Farmers' access to extension services and training on CSA has enhanced farmers' perception of climate change and climate-smart agriculture. The provision of extension services increases farmers' knowledge, skills, and awareness towards innovations. An increase in knowledge of CSA practices is likely to increase the adoption of CSA in cocoa production.

### **Educational Importance and Recommendation**

Climate-smart agriculture practices increase agricultural productivity and increase resilience to climate variability and change. This project helps smallholder cocoa farmers adapt to sustainable and smart- practices that will enhance their cocoa productivity and increase the resilience of their cocoa farms to climate change. To increase the adoption of CSA practices in the study areas, governments need to prioritize climate change and climate-smart agriculture awareness and allocate sufficient funds toward smallholder cocoa production.

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**Leveraging Expert Consensus to Identify Barriers and Strategies to Build Diversity,  
Equity, and Inclusion in Extension**

**Gusto, Cody**

University of Florida  
410 Rolfs Hall; P.O. Box 110540; Gainesville, FL,  
32611, USA  
cgusto@ufl.edu

**Diaz, John**

University of Florida

**Narine, Lendel**

Utah State University

**Silvert, Colby**

University of Florida

**Jayaratne, K.S.U**

North Carolina State University

**Keywords:** barriers, diversity, equity, extension, inclusion,

## Introduction

The growing adoption of diversity, equity, and inclusion (DEI) initiatives across extension represents a long-overdue effort to reconcile a tumultuous history of racially discriminatory practices, redress disproportional representation of educators of color, and improve the cultural responsiveness of programming provided to all clientele (Deen et al., 2014; Ostrom, 2020; Whitehall et al., 2021). However, barriers to the successful implementation of DEI initiatives and policies have been identified across organizational contexts globally, including primary schools, higher (i.e., post-secondary) education institutions (HEIs), private-sector firms, and non-governmental organizations (NGOs) (Calderón-Almendros et al., 2020; DiMillo et al., 2021; Kezar et al., 2008; Muñoz et al., 2017).

Despite growing efforts to identify challenges to intercultural competence (ICC) and DEI policy promotion and implementation in extension, there remains a need to examine these challenges in a rigorous, collaborative, and systematic way (Deen et al., 2014; Ostrom, 2020; Walcott et al., 2020). Through a structured, consensus-based research approach, we present a framework for extension practitioners to identify the most salient factors affecting successful DEI implementation in their own contexts.

## Theoretical Framework

Organizational readiness for change (ORC) is an evolving and multi-faceted framework developed to assess whether an organization's members (and, by proxy, an organization itself) are adequately prepared to adapt to internal and external changes (Lehman et al., 2002; Weiner, 2009). ORC is broadly concerned with identifying the most salient determinants of change initiation, examining organizational members' change intent and capability through resource availability, informational awareness, perceived self-efficacy, internal policy constraints, and a host of situational factors (Weiner, 2009). ORC has been applied in a variety of organizations, from regional rehabilitation clinics to multinational manufacturing firms (Lehman et al., 2002; Susanto, 2008). Although ORC has been operationalized in distinct ways across contexts, certain ORC components are commonly featured, including *change commitment* (i.e., members' joint resolve to implement a change), and *change efficacy* (i.e., shared belief in members' collective capability to implement said change) (Weiner, 2009). In this study context, ORC offers a useful lens to assess extension key stakeholders' commitment to and capacity for change by identifying factors (e.g., structural barriers) most likely to influence change readiness.

## Purpose and Objectives

This Delphi study sought to reach consensus among experts on the most pervasive barriers and most effective strategies to achieving DEI in extension. The following objectives guided this study:

1. Determine the agreed barriers to DEI in extension.
2. Determine the agreed upon strategies for overcoming barriers to DEI in extension.
3. Determine a single strategy that has the potential to build DEI in extension.

## Methods

We utilized a three-phased Delphi approach to leverage the expertise of a panel of DEI specialists in extension. We purposively sampled 11 individuals from a larger panel of ICC experts previously selected for another major ICC study. Once the original ICC study concluded, the 35-member panel reconvened to explore barriers to DEI in extension. Through these discussions, the 35-member panel nominated a subgroup of 11 panelists to participate in this Delphi study based on their combined expertise in ICC, DEI, and extension education.

In the first phase of the current study, we provided the 11 panelists with three open-ended questions to prompt engagement with three areas of inquiry; (1) barriers to DEI in extension, (2) strategies for overcoming barriers to DEI in extension, and (3) a single strategy with the potential to move the needle on DEI success in extension.

In the second phase, panelists were asked to rate items using two separate scales: barrier extent and strategy effectiveness. For barriers, we asked participants to rate the extent of the barrier using a 4-point scale, (*1 = Not a barrier; 4 = Major Barrier*). For both strategy categories (i.e., strategies and single strategies) we asked participants to rate the effectiveness of each strategy using a five-point scale (*1 = Not effective at all; 5 = Extremely effective*). An *a priori* definition of consensus as two-thirds of panelists' agreement was applied both for the identification of those barriers and strategies that would advance to the third and final round.

In the final phase, the phase two process was repeated with the synthesized responses that advanced through consensus. With a 100% response rate ( $n = 11$ ), panelists again rated barriers and strategies using the same scales. Responses within each category that met the two-thirds consensus threshold in this round were considered in the study's final results.

## Results and Conclusions

Panelists achieved consensus on a final list of two barriers to DEI in extension, 19 strategies for overcoming barriers to DEI in extension, and 10 single strategies with the potential to build DEI success in extension. The two barriers with two-thirds consensus threshold were: *All policies and procedures are designed to serve one traditional group of people*, and *Lack of diversity among extension professionals*. There were 19 strategies for overcoming barriers to DEI in extension met the consensus threshold and were included in final results, including: *Develop hiring committees with individuals that understand and prioritize organizational diversity*. Finally, 10 single strategies with the potential to build DEI success in extension met the final consensus threshold, including: *Involvement and support of upper administration across the organization*.

## Recommendations and Implications

Results indicate there is high-level agreement on both strategies and single strategies to improve DEI programming in Extension. There is strong consensus, for example, that that DEI needs to be more routinely formalized in extension through administrative buy-in and support. Focusing on DEI implementation in the hiring stage was another highly agreed-upon solution that could be widely adopted across extension contexts. Responses in these categories - if broadly replicated in

a similar consensus-based process in other extension contexts – may serve as legitimate proposals to extension administrators and appointed DEI committees to overcome deficiencies in current DEI practice. Given only two barriers reached the final consensus threshold, we recommend continued focus on identifying and reaching consensus on barriers to successful DEI implementation across extension contexts. The strategies identified by this study can be used as a framework for building DEI in extension services across the globe.

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## **Eurocentric Attitudes about Agriculture at a U.S. Land Grant University**

Gary Wingenbach, Professor & Senior Scientist  
2116 TAMU, 261 AGLS Bldg.  
Texas A&M University  
College Station, TX, USA  
[gary.wingenbach@ag.tamu.edu](mailto:gary.wingenbach@ag.tamu.edu)

Alison Wooten, Graduate Research Assistant  
Department of Agricultural Leadership, Education, and Communications  
Texas A&M University

Keywords: Eurocentrism, Attitudes, Agriculture, Postsecondary Education



# **Eurocentric Attitudes about Agriculture at a U.S. Land Grant University**

## **Introduction**

Eurocentrism is based on the premise that European ideologies are the only viable systems for understanding our world. This view is invalid in agriculture where soils, climatic conditions, and socio-economic factors affect food and fiber production worldwide. Yet, evidence (Persaud et al., 2008; Rouse et al., 2013) remains that Eurocentric attitudes about North American and European agriculture persist at U.S. land grant universities.

Ideally, post-secondary students should have less Eurocentric attitudes about agriculture if studying global agriculture. Realistically, Persaud et al. (2008) and Rouse et al. (2013) each found university agriculture students held Eurocentric attitudes about North American and European agricultural production (i.e., more favorable climate, soils, etc., than experienced elsewhere), despite focused studies in global agriculture. Consequently, if these Eurocentric views persist in university education, then we perpetuate agricultural production myths based on Anglo-Saxon and American beliefs of food and fiber production superiority.

Eurocentrism affects higher education, educators, and students. Ware and Ware (1996) found that Eurocentric perspectives operate as ideological censors that privilege Americans of European descent, while denying legitimacy to all other views. If Eurocentric beliefs exist in university settings (i.e., curricula, teaching methods, learning processes), are other beliefs (e.g., Afrocentric) permitted equally? Researchers, (Alvares, 2011; Kerner, 2018; Ware & Ware, 1996; Weller, 2017) highlighted Eurocentrism's impact on academic institutions, but what about its impact on agriculture-based institutions? Do U.S. land grant university members possess Eurocentric beliefs about agriculture? This study updates previous works on Eurocentrism in agriculture (Persaud et al., 2008; Rouse et al., 2013).

## **Purpose and Objectives**

The purpose was to determine if Eurocentric attitudes about agriculture at a U.S. land grant university had changed in the past decade. The research objectives were to a) measure Eurocentric attitudes about agriculture, and b) determine if significant differences existed in attitudes when compared by selected variables.

## **Methods**

A cross-sectional survey design was used. The study population was members at a U.S. land grant university in spring 2021, including students, faculty, and staff. Stratified random samples were drawn from 70 agriculture and non-agriculture courses with global or international attributes. Students were sent personalized invitations; faculty and staff invitations were broadcast on university listservs. A 62% response rate was achieved. Instrumentation was adapted from previous studies (Persaud et al., 2008; Rouse et al., 2013). Eurocentric attitudes were measured using Landes' (1998) 16 propositions about North American and European agriculture. Mirroring Persaud et al. (2008), we postulated that respondents with no Eurocentric bias would disagree with all 16 propositions. Demographics were collected for group, sex, race, and college. Data were gathered online. Descriptive statistics and non-parametric tests were used to report the data.

## **Results**

Of the 249 valid responses, the majority were undergraduate (59%) males (59%) from non-agriculture (68%) colleges. About 72% identified as White, 71% were from non-agriculture families, and 73% were not planning an agriculture career. To determine respondents' Eurocentric attitudes about agriculture, participants indicated their agreement with 16 propositions about North American and European agriculture, using a 6-point scale. Participants somewhat agreed that North American agriculture flourished because of venturesome European immigrants, and climate of North America/Europe is better for human comfort than other climates. They somewhat disagreed that North America/Europe was less affected by human diseases than in other continents.

The second objective was to determine if significant differences existed in Eurocentric attitudes about agriculture when compared by selected demographics. Kruskal-Wallis results showed no differences in Eurocentric attitudes about agriculture according to group status. Males were significantly less biased than were females regarding that North America/Europe suffered less from natural disasters than other continents, and that Christianity among European immigrants contributed significantly to North America's agricultural development. Caucasians were significantly less biased that North American agriculture flourished partly because European immigrants brought free markets with them. No differences in Eurocentric attitudes about agriculture existed by college. Kruskal-Wallis tests revealed a dozen significant differences between the current study and previous works (Persaud et al., 2008; Rouse et al., 2013); respondents were significantly less biased in the Rouse et al. (2013) study, than they were in the current or Persaud et al. (2008) studies. Rouse et al.'s (2013) participants were enrolled in a modern agriculture course that included international concepts.

### **Recommendations**

Like previous studies (Persaud et al., 2008; Rouse et al., 2013), we found prevalent Eurocentric attitudes about agriculture at a U.S. land grant university. North American agriculture is not particularly more successful due to free markets, Christian work ethic, or because it suffered fewer natural disasters than elsewhere. U.S. agriculture owes its success to widespread adoption of agricultural innovations, capital investments, private/public research, and government assistance. However, similar factors are evident in South Africa, Russia, China, and Brazil, demonstrating the interconnectedness of global food and fiber production and consumption. Participants should know and value contributions from many regions to better understand its effects on food security.

Given that Eurocentric attitudes pertaining to agriculture remain in postsecondary education, agricultural educators must further their knowledge about global food and fiber systems to better teach others. Educators can minimize mythological views about North American or European agriculture superiority, which broadens learners' views of contributions from non-North America or European countries. Students can benefit from an infusion of global agriculture content in the classroom. Rouse et al. (2013) showed such course content influences participants' biases positively. Rouse's participants were enrolled in courses with international agriculture content; 12 of 16 propositions were ranked with significantly less bias in Rouse's study than were in the current or Persaud et al. (2008) studies, neither of which targeted global agriculture courses.

Agricultural employers need employees who are culturally aware and informed about global issues. Future employees require greater awareness and knowledge of global agricultural systems to help U.S. businesses remain competitive in global markets. Educators must teach

students differences between fact and fiction, especially to dispel Eurocentric attitudes about agriculture, to prepare them better for future agricultural careers.

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## **Agricultural Industry Leaders Exploration of Stoicism**

Amy Brown, University of Florida  
[amybrown@ufl.edu](mailto:amybrown@ufl.edu)  
127 M L King Ave  
Saint Augustine, FL. 32084

Dr. Nicole Stedman, University of Florida  
Brad Coleman, University of Florida  
Clay J. Hurdle, University of Florida

## Introduction

Among the demands of agricultural education are producing employment-ready graduates who have critical thinking and leadership skills to meet the demands of today's global environment (National Research Council, 2009). The National Food and Agribusiness Management Education Commission recognized critical-thinking skills as the second-highest priority for college graduates (Boland and Akridge, 2006). Educators have long worked to meet those needs for future leaders' success in a complex world (Stedman, 2009).

In support of the Association for International Agriculture and Education (AIAEE, 2020) goals that include strengthening agricultural education programs through dialogue and learning, this paper presents a topic aimed at furthering agricultural leadership education. Since 300 BCE, Stoicism has guided the world's greatest leaders in overcoming challenging situations (Aurelius, 1915; Aurelius, ca. 160 A.D./2002). Using the philosophy's core disciplines, Stoics adopt decision-making skills, critical thinking, resilience, humility, and empathy and can make difficult decisions that advance themselves and others toward a better life (Rhodes, 2019). Despite the common misconception that Stoics are emotionless and devoid of suffering, Stoicism is a practical philosophy aimed at achieving eudaimonia, happiness, and human flourishing (Oxford Dictionary, 2020; Sandbach, 1994).

Fundamental doctrines of the ancient Greek philosophy were introduced to AIAEE in the poster, *A Fresh Look at the Philosophy of Stoicism in Agricultural Leadership* (Brown et al., 2021). Results of that work indicated agricultural leaders shared the perspective of the standard definition of Stoicism. Yet, publications such as the New York Times, Entrepreneur, LinkedIn, Inc.com, and Forbes teach Stoicism as a means of support for leaders tackling complex problems (Anderson, 2012; Bowles, 2019; Gambhir, 2019; Manthorpe, 2017; Tank, 2019). These differences have inspired continued research exploring perceptions of Stoicism within the agricultural industry.

The purpose of this study is to investigate agricultural industry leaders' perceptions of Stoicism. Study participants' opinions of Stoic behaviors in themselves and others are explored. This study was guided by one research question:

What are individuals' perceptions of Stoicism and Stoic behaviors, and do any applications exist for leaders in the ag industry?

## Methods

A phenomenological research design was used (Ary et al., 2014; Creswell, 2013). Phenomenological methods are used to explore the perspectives and lived experiences of multiple participants around a shared phenomenon. Participants were considered leaders in the agricultural industry due to their participation as officers of professional farm organizations.

## Data Collection

Two focus groups were conducted separately. There was a total of 14 participants. Data were collected through audio recording and transcribed via paid transcription. Participant names were eliminated from the transcription.

Inductive coding was used to conceptualize the data into themes (Creswell, 2013; Creswell & Creswell, 2018). Specifically, this was accomplished using the constant comparative method (Corbin & Strauss, 2015). Three rounds of coding were employed: open, axial, and

selective (Saldaña, 2021). In round one, open coding was used to interpret and label individual pieces of data. Then, axial coding was used to explore the relationships among the codes and conceptualize them into categories. Lastly, selective coding was used to condense the categories into established themes (Saldaña, 2021). Rigor and trustworthiness were established through confirmability, dependability, credibility, and transferability (Ary et al., 2014; Lincoln & Guba, 1985). Throughout the data collection and analysis, the researchers practiced self-reflexivity through bracketing their biases around the phenomenon (Tracy, 2010). This occurred through written reflective journaling and reflective conversations among the researchers (Tufford & Newman, 2010).

## **Results**

Preliminary findings of the results from the two focus groups repeatedly resulted in three emerging themes.

### **Stoic misunderstanding**

It was evident participants had no pre-existing awareness of the philosophy of Stoicism and understood it to be the dictionary definition. For example, participants from the second focus group used the words poker-face, statuesque, without emotion to describe being stoic. Participant three from the first workshop said: "My impression of Stoicism is very poised but not showing a ton of emotion. Like keeping yourself very even-keeled. Like you don't get too excited, you don't get too down."

### **Self-identification**

As participants were familiarized with the philosophy's doctrines they reflected on their own modeling of Stoic behaviors. In the second workshop, participant one stated, "I feel like I pretty much already do all of those.". In the first group, participant five reflected on the board's guidance from their president, saying, "She really has been the one that puts us in the stoic state of mind when we come to these meetings - I just didn't know what it was."

### **Desirability**

Participants recognized areas in their personal and professional lives where the philosophy would be helpful. The first group discussed how it would keep their day from being derailed. Participant 3 specifically said,

"...this is a good thing. That it is exciting. Maybe we should all try to be a part of this because the more of us that are trying this, the better people we're all gonna be supporting each other."

## **Recommendations and Conclusions**

Success in the global agricultural industry requires a unique set of skills to navigate complex challenges. Agricultural educators look for opportunities to instill those skills and behaviors in future leaders. On one hand, Stoicism is associated with the common definition and misunderstood and dismissed in the academic field (Grewal & Salovey, 2005; Mayer et al., 2008). Yet professionals' interest in the topic for guidance on topics such as problem-solving and resilience, is supported by the increasing presence of Stoicism in the popular press.

These research findings suggest agricultural leaders share that misconception of Stoicism, yet after being familiarized with the core meanings, not only identify with some of the behaviors but find meaning and value in using them more often. Due to this, there is an opportunity for the agricultural industry to continue exploring the implication of Stoicism for the field, at a minimum starting with awareness, and at its best using continuing education to assist in

professionals Stoic practice. Through this lens, Stoicism stands as a potential teaching tool for preparing individuals to work in a complex global setting.



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**Overcoming Wicked Problems in International Agriculture through Team Science:  
Identifying the Characteristics of a High Performing, Interdisciplinary Team**

**Kristin E. Gibson**

University of Georgia  
145B Four Towers Building  
Athens, GA 30602  
kristin.gibson@uga.edu

**Millicent A. Oyugi**

University of Georgia

**Alexa J. Lamm**

University of Georgia

**Janine Sherrier**

University of Georgia

**Keywords:** case study, interdisciplinary teams, international agriculture, team science

## Introduction and Literature Review

Unprecedented problems in international agriculture have exacerbated the need for high performing, interdisciplinary scientific teams able to solve issues and generate knowledge (O'Neill & Salas, 2018). Successful and effective interdisciplinary teams require a high level of teamwork (Adams et al., 2012; Bruce & Ricketts, 2008), which is often not easy to describe and can be difficult to achieve (Driskell et al., 2019; O'Neill & Salas, 2018). Team science, which is "a collaborative effort to solve a scientific problem that makes use of the skills and experience of experts who are often educated in disparate disciplines" (National Research Council et al., 2015) should enable international agricultural researchers to address complex problems through the application of methodological and conceptual approaches from multiple disciplines (Stokols et al., 2013). However, international interdisciplinary teams face challenges when trying to work collaboratively due to a diversity of culture, language, and identity of individuals on the team, highly relevant as "successful team problem solving is essential to [...] the global agricultural community" (Brodeur, 2011, p. 25). Therefore, identifying how interdisciplinary teams can be high performing in a real-life setting to inform the development of high functioning international interdisciplinary teams is an important area of inquiry. The research question that guided this study was: What is it about a highly successful interdisciplinary research team of scientists that has made them so successful over time?

## Methods

To address the research question, a case study approach was used to explore team science in the context of an interdisciplinary research team (Crowe et al., 2011). Social science researchers frequently use case studies to study real-life phenomenon (Crowe et al., 2011). The interdisciplinary research team, hereafter referred to as the Plant Genome Research Team, identified for this case study researches mutualistic plant-microbe symbioses in *Medicago truncatula* and is funded through the National Science Foundation. The Plant Genome Research Team was chosen for this study as they are highly successful team who produced 71 papers in refereed journals from 2012-2016, advanced publicly available research on *Medicago truncatula*, and assisted students and new scholars reach their professional goals.

A focus group was conducted with the Plant Genome Research team via Zoom. A moderator guide was developed and reviewed by a panel of experts in qualitative and plant genome research to ensure transferability and trustworthiness (Lincoln & Guba, 2002). The focus group included one trained facilitator, one note taker, and nine members of the research team. Verbatim transcriptions of audio recordings and notes were used as the data analyzed for triangulation purposes (Lincoln & Guba, 2002). Demographics were not collected from participants and pseudonyms were assigned to ensure confidentiality.

Data were analyzed via MAXQDA using a thematic analysis, which entails a coder who identifies themes that are reoccurring in the dataset (Braun & Clarke, 2006). According to Braun and Clarke (2006), a theme is "something important about the data in relation to the research question, and represents some level of patterned response or meaning within the data set" (p. 82). Themes were allowed to develop naturally throughout the process through an emergent coding approach (Braun & Clarke, 2006; Castleberry & Nolen, 2018). Peer debriefing was used to ensure transferability (Barber & Walczak, 2009).

## Results

Three themes emerged from the focus group: professional support, personal connections, and collaboration. Professional support often entailed career advancement or achievements. For example, Participant D noted the team's most significant accomplishment was:

[...] to see [Participant A] grow into a PI role [...] is really exciting. [...] that's not our scientific goal necessarily, but it's a major goal. We believe that science is important and that science overall is important, and [Participant A's] been so successful so far and has such great potential that it's, that's very satisfying.

Career achievements outside of the team's work itself were also celebrated, such as success with 4-H, cooperative extension, and industry jobs.

Personal connections within the team were also important to the participants. Participants reported communicating with each other at ease, which fostered a sense of community. One participant said:

[...] the most important point here is each of these person [...], they are easy to reach, to talk with them to interact that's very important, independently of their position. [...] I feel totally comfortable if I need to ask any of them for anything that's pretty important.

In addition, personal connections extended beyond the work place, with participants reporting visiting one another and supporting personal accomplishments.

The importance of collaboration in the Medicago community was emphasized throughout the discussion. Collaboration was often associated with success and scientific advancement. One participant stated “[...] all of the projects together basically raised Medicago to a status of a model system that can be used for many, many things [...]”.

### **Discussion and Conclusion**

The results uncovered that success within the Plant Genome Research team was attributed to professional support, personal connections, and collaboration with team members and scientists outside of the team. Scientific advancement was important to the team and was related to professional support, personal connections, and collaboration, but a successful team required more than the common goal of scientific advancement. Team members who supported the professional and personal goals of other team members were ultimately what made the team successful. The findings are similar to Stokols et al. (2008) who discovered scientific or intellectual achievements of a team are impacted by the social dynamics of that team. Moreover, multiple statements coded under professional support, personal connections, and collaboration overlapped implying that success could not be achieved independent of one another. Ensuring professional support, personal connections, and collaboration within international interdisciplinary teams is a lofty goal, but high performing teams are needed to address wicked problems facing international agriculture (Brodeur, 2011). Future research is needed to determine factors or activities that influence professional support, personal connections, and collaboration in teams, specially related to cross cultural teams, so that complex problems like food security can be addressed. Professional development opportunities should also be created and tested that adhere to these themes.

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## **Examining Smallholder Coffee Farmers' Perceptions Driving Collective Actions**

**Colby J. Silvert**

Department of Agricultural Education and Communication  
University of Florida  
PO Box 110540  
Gainesville, Florida 32611  
colby.silvert@ufl.edu  
University of Florida

**John Diaz**

University of Florida

**Laura A. Warner**

University of Florida

**Willis Ochieng**

University of Florida

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## **Introduction**

Donors and development organizations prioritize investments in smallholder agriculture to elevate households from poverty and promote food security (Fanzo, 2017; United States Agency for International Development [USAID], 2019, World Bank, 2013). Researchers have found that smallholders' emergence from poverty may be inhibited by significant agricultural constraints and risks, such as being unable to afford transaction costs (e.g., transportation) to sell small quantities of produce (Arias et al., 2013; Poulton et al., 2006) and lack of access to key inputs such as extension and finance, which can diminish productivity and resulting income generation and food security (Agribusiness Commercial Legal and Institutional Reform Diagnostic [AgCLIR], 2016; Arias et al., 2013). Smallholders who farm commodity crops, such as the Peruvian coffee farmers in this study, face additional risks of income loss from fluctuations in the international market (Talbot, 1997).

Peruvian coffee is produced by mostly smallholder farmers with plots of land averaging 7.4 acres (three hectares) (United States Department of Agriculture Foreign Agricultural Service [USDA], 2018). Research suggests smallholders in Peru and elsewhere improve their positioning to compete and market in the globalized food system through collective actions (i.e., association or cooperative organization, in which farmers work together in formal or semi-formal capacities). Smallholders in associations or cooperatives often enhance their negotiating power and receive higher prices for produce (Lowitt et al., 2015; USDA, 2018). The most established coffee producer groups in Peru have also linked smallholders with finance and direct-to-consumer marketing (USDA, 2018). Withstanding the benefits of collective action, lack of trust and diminished social cohesion appear to be barriers that dissuade some smallholders from working together with peers (Lowitt et al., 2015). These nuances and benefits of collective actions demonstrate a need to better understand the factors which may influence smallholder farmers' engagement with peers.

## **Conceptual Framework**

This study was guided by a conceptual framework based on the *knowledge, attitudes, skills, and aspirations* (KASA) level of the Bennett's Hierarchy evaluation model (Bennett, 1975). The authors focused on KASA because numerous researchers have already studied how assets, technical capacities, and market conditions impact collective actions (Barham & Chitemi, 2009; Fischer & Qaim, 2012). However, few studies were located which directly assessed whether personality and intrinsic factors could determine smallholder mobilization and collective actions. This study's variables attempted to measure coffee farmers' attitudes and aspirations regarding working with peers versus independently. An additional variable captured self-reported knowledge and skills to pursue collective action to better adhere to Bennett (1975). Finally, two behavioral variables (farmer-reported pooling of production and frequency of engagement in learning or extension activities) were used to examine associations between perceptions and related practical outcomes.

## **Purpose and Objectives**



This study addresses a gap in understanding relationships between smallholder farmers' perceptions and engagement in collective actions with peers for production and commercialization activities. The purpose of the study was to examine how smallholder coffee farmers' attitudes, aspirations, and knowledge and skills regarding working together with peers may determine their motivation for and pursuit of collective actions.

## **Methods**

We interviewed 40 smallholder coffee farmers in three central highland communities of Peru. Multi-stage purposive and snowball sampling were employed in coordination with the Shared-X company and academic partners in Peru. Peruvian agribusiness students familiar with the region's coffee production were trained and administered the questionnaires in Spanish.

The variables included in the instrument were developed from Bennet's (1975) previously introduced KASA constructs. Likert-type variables were extracted for this study from the full questionnaire by Silvert et al. (2021) for relevance to collective actions and perceptions of working with peers. We also surveyed farmers on their demographics, formal education level, and engagement with extension and technical support. The reliability and consistency of questionnaire's original indices were verified using Cronbach's alpha coefficient.

We analyzed demographic and external assistance data using descriptive statistics and frequencies. We applied measures of central tendency then correlational analysis, using Spearman's correlation coefficient, for all individual Likert-type items (KASA and behavioral engagement) to examine associations between pairs.

## **Results and Conclusions**

This study's findings point to three key conclusions to understand perceptions that may influence smallholder coffee farmers' collective actions. First, significant correlations indicate farmers perceive benefits from improving their knowledge and skills in peer mobilization. Farmers' motivation to increase this capacity aligns with research suggesting that ability to mobilize and form associations boosts negotiating power and marketing returns (Lowitt et al., 2015; USDA, 2018). Second, results indicate farmers perceive a need for assistance to accomplish their production and marketing activities, and this assistance could be provided in part from collective actions with peers. This is an important finding because literature suggests outside support (e.g., development projects) can lead to over-dependence and may often be unsustainable (Bebbington et al., 1996; Markelova et al., 2009; Silvert et al., 2021). However, collective action with peers could demonstrate farmers' self-reliance as a local source of capacity. The final conclusion is that farmers who report being confident and knowledgeable and skilled are also motivated to build trust with peer farmers, and trust appears to be a precondition for peer collective actions (Lowitt et al., 2015). This finding could inform the identification of leader farmers to mobilize their peers. Leader farmer systems are commonly used in developing countries to facilitate peer-to-peer learning and behavior diffusion (Sesonga, 2018; Simpson et al., 2015).

## **Recommendations**

We recommend practitioners and farmer group leaders concentrate capacity building on enhancing smallholders' knowledge and skills in peer mobilization and illustrating the benefits of collective actions to build motivation. Research indicates farmers often learn better from other farmers rather than outside professionals (Suvedi & Kaplowitz, 2016; Van den Ban & Hawkins, 2002). Farmer-to-farmer exchange visits and farmer-led field demonstrations are experiential techniques to promote learning and showcase benefits of collective actions. We also recommend practitioners and farmer leaders encourage collective actions to build local, community-based capacity and reduce the need for external assistance. Finally, targeting more innovative farmers to lead collective actions, such as those more technically skilled and self-efficacious, is recommended to set positive trends for peers and disseminate improved behaviors (Rogers, 2003; Simpson et al., 2015).

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**A Farmer-to-Farmer Extension Certification: A Proposition to Improve the Sustainability of Smallholder Agricultural Development**

**Colby J. Silvert**

Department of Agricultural Education and Communication

University of Florida

PO Box 110540

Gainesville, Florida 32611

colby.silvert@ufl.edu

University of Florida

**John Diaz**

University of Florida

**T. Grady Roberts**

University of Florida

**Bradley M. Coleman**

University of Florida

**Whitney A. Stone**

University of Florida

**Keywords:** aquaculture, extension advisory services, farmer-to-farmer, smallholder farmer, Sierra Leone

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## **Introduction**

Modern extension and advisory services (EAS) have shifted away from centralized government-led programs toward pluralistic services including private, nonprofit, and public sector providers (Norton & Alwang, 2020). This has increased the privatization of EAS targeting commercial farmers (Kherellah et al., 2000; Paalhaar & Jansen, 2011). While these trends help address issues around resources and mobility that have plagued public extension, a gap remains in EAS supporting smallholder farmers, who often still struggle to access improved agricultural technologies (Suvedi & Kaplowitz, 2016).

While donors and development organizations have prioritized confronting smallholder farmers' economic and agricultural disparities and barriers (Fanzo, 2017; IFAD, 2016; USAID, 2019), the sustainability of these interventions may diminish over time. Specifically, farmers can become over-dependent on outside, temporary interventions and struggle to continue improved practices and access resources when interventions conclude (Bebbington et al., 1996; Markelova et al., 2009). Therefore, given the importance of EAS as an input in smallholder agricultural systems, practitioners are challenged to establish sustainable EAS linkages that continue providing for smallholders beyond the duration of interventions.

Farmer-to-farmer (F2F) extension is a potential solution for practitioners to build a sustainable infrastructure of information and technology dissemination and support in smallholder communities. F2F EAS approaches, typically centered around volunteer leader farmers who advise and support their peers with information, demonstrations, and resources, date back to the 1950s and have become common in developing contexts (Masangano & Mthinda, 2012; Selener et al., 1997). The implementation of F2F EAS is encouraged by studies indicating farmers learn more from their peers than others (Suvedi & Kaplowitz, 2016; Van den Ban & Hawkins, 2002). Notwithstanding the benefits, a central concern for F2F EAS is whether leader farmers stay motivated to provide services for other farmers on a volunteer/unpaid basis (Simpson et al., 2015).

## **Purpose and Objectives**

The purpose of this study was to document lessons learned from a novel F2F EAS certification, which aimed to build a lasting network of high-quality peer-to-peer EAS in Sierra Leone. This paper explores the methods and rationale for this certification proposition, first proposed for the USAID-funded Scaling up Aquaculture Production (SAP) project, as well as the broader implications for practitioners involved in EAS development for smallholder farmers. The objectives that guided this proposition were to (a) examine how a F2F extension certification for smallholders could motivate leader farmers to provide extension for their peers and communities; and (b) explore measures to boost the sustainability of F2F EAS via linkages with institutions, the private sector, and extension networks.

## **Methods**

The SAP project's broad aim was to increase freshwater fish production and consumption by smallholder farmers via development of an aquaculture value chain in Sierra Leone. The project

and its pilot phase were executed between 2015 and 2019 (WorldFish, 2016; WorldFish, 2017). A crucial input, nonexistent in Sierra Leone at the time, was aquaculture-specialized extension services. Therefore, the SAP project trained and positioned practitioners in intervention communities to build local farmers' capacities and provide technical assistance. Over time, the communities' farmers took on volunteer leadership roles to mobilize, model good production practices, and provide information for their peers. The project's "sustainable transition strategy" to ensure long-term changes after the conclusion of interventions hinged on continued provision of fish farming EAS. For this reason, the idea for the F2F extension certification developed. Three key steps outlined for this proposition were to design a qualifying exam process, to engage stakeholders for a certification ceremony, and to establish and strengthen linkages to an EAS network. We describe more details about the final, resulting process and the intended products of the proposition below.

### **Results and Products**

A key product was the development of an examination process to ensure certified farmers demonstrated sound technical fish farming knowledge and peer mobilization skills and authority. A practical exam format was agreed upon to assess real-world applications (e.g., fish production demonstrations and facilitation), which was sensitive to many smallholders' lack of formal education. The project also planned to use data collected for indicators on farmers' productivity and marketing returns to identify and encourage exemplary farmers to take the certification exam.

The awarding of certification for farmers was deemed critical for building smallholders' motivation as volunteer EAS providers and engaging stakeholders. The SAP team determined co-sponsorship by Sierra Leone's Ministry of Fisheries and Marine Resources and/or Agriculture would formalize the new F2F network and add credibility to the certification. For many smallholders with few formal educational credentials, a government-sponsored certification was posited as a meaningful achievement that may lead to other future opportunities (i.e., paid fish farming assistance roles). Certification ceremonies were proposed with stakeholders from the community, government, USAID, local universities, and others to celebrate the farmers' certification and officially establish a F2F EAS fish farming network in Sierra Leone.

Linkages to stakeholders and institutions with knowledge and resources were integrated throughout the entire proposition. While the smallholders would lead the EAS provision, connecting them to universities, the government, and the private sector could help them better respond to issues and disseminate innovative behaviors. The aim of the linkages would be to facilitate two-way exchange and encourage outside investment (Leeuwis, 2004; Taylor & Bahsme, 2018). Finally, it was proposed that a local university partner of the SAP project house/maintain a database of the F2F network for educational and outreach purposes and to boost sustainability.

### **Implications and Recommendations**

F2F EAS certification can be an innovative solution to address the need for development practitioners to establish sustainable EAS in smallholder communities. We predict potential

social or political implications could arise from this approach, which should be considered regarding power dynamics, social equity, and perceived competition between the F2F certified farmers and government or other extension agents. Therefore, a thoughtful and inclusive stakeholder engagement process seems essential to define unique roles and build mutually beneficial partnerships. Finally, we recommend practitioners and researchers test this and similar approaches across smallholder farming contexts for validation and to share lessons, training techniques, and best practices.

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**Soil Allies for International Development: Blending Agroecological Research with  
Innovative Community Outreach**

**Adam B. Cobb, Ph.D.**

Soil Food Web School

29635 S Molalla Ave

Molalla, OR 97038

Tel. #: 405.338.5821

[adam@soilfoodweb.com](mailto:adam@soilfoodweb.com)

**M. Craig Edwards, Ph.D.**

Oklahoma State University

**Keywords:** econutrition, microbial interactions, sustainable interventions

# Soil Allies for International Development: Blending Agroecological Research with Innovative Community Outreach

## Introduction

Global soil loss is a looming crisis for world food security, especially in regions such as sub-Saharan Africa (SSA) [Kim et al., 2021]. Regenerating soil ecosystems is a key sustainability strategy at every farm scale, and farmer adoption of improved soil management methods is critical for agricultural development (Gosnell et al., 2019). Further, agricultural soils have potential to offset substantial greenhouse gas emissions, representing an important climate-change mitigation strategy (Lal, 2021). However, a review of soil health in SSA indicates poor management practices are reducing soil fertility, critical ecosystem services, and constraining the capacity of small-scale farmers to supply adequate nutrition to their communities (Tully et al., 2015).

Emerging research in agroecology and plant-microbial dynamics reveals key opportunities to stabilize farm soils, enhance productivity, and reduce poverty (Cobb et al., 2017). For example, beneficial soil fungi present an opportunity to make global agriculture more efficient, more sustainable, and more productive (Ellouze et al., 2014). However, soil biology discoveries are not rapidly diffusing to smallholder farmers in many countries due to numerous factors, including disjointed research and outreach networks (Maertens et al., 2021; Tetteh, 2021). We propose that careful application of Rogers' (2003) diffusion of innovations (DoI) theory guide agricultural development efforts from basic soil research to soil management outreach. One example is breeding crops to *partner* with beneficial microbes to optimize yields and food nutritional quality, with minimal fertilizer use (Cobb et al., 2016; Denison, 2012).

Navarro (2008) highlighted that effective solutions to poverty must link local people,

institutions, and their pooled indigenous knowledge with outside facilitators as “an interactive and integrative model of shared knowledge and joint discovery” (p. 75). This suggests any innovation introduced in a community, by development professionals, must be *reimagined* through local frameworks and implemented in collaboration with farmers (Maertens et al., 2021). In the context of soil ecosystem management, this implies significant challenges given persistent knowledge gaps regarding soil biology, plant community dynamics, and microbial ecology. However, examples such as the One Acre Fund (Thurow, 2013) demonstrate how improved soil management can successfully diffuse through communities when change agencies design interventions in harmony with participatory approaches.

### **Purpose/Objectives**

We will highlight philosophical connections between social science models such as Rogers (2003) and Navarro (2008) and unify these approaches with examples of soil agroecology research in concert with the *econutrition paradigm* (Blasbalg et al., 2011; Deckelbaum et al., 2006). This tactic provides an overall structure to elucidate solutions to critical and interconnected problems related to poor soil management, environmental degradation, and community malnutrition. Bridging these disciplines is a key facet to reducing global poverty by developing sustainable, community-based food systems. For instance, our crop genetic research was inspired by discussions with scientists and extension professionals from SSA regarding their concern that commercial crop genotypes are inappropriate for the region’s small-scale producers. We explored belowground mechanisms that explain and alleviate the issues they observed (Cobb et al., 2016). By building ecological and social science linkages, we advocate that *transdisciplinary collaboration* is imperative for sustainable agricultural development. Combining regenerative agroecology and principles of human social dynamics will

enhance community projects by building capacity for farmers to understand and effectively manage soil ecosystems.

### **Data Sources/Themes**

Soil biology provides a foundation for multisectoral community programming, enabling a range of innovations in agriculture, nutrition, and natural resource management. For example, crop symbioses with mycorrhizal fungi offer a potential path to maintain or improve food production and nutrition with fewer economically costly and environmentally harmful inputs. However, these nutrient-providing relationships appear to have been *accidentally suppressed* during modern crop breeding, presumably because genotypes were selected under high fertilizer input conditions, resulting in reduced growth benefits from mycorrhizal fungi (Hetrick et al., 1995). Utilizing Rogers' (2003) perspectives regarding DoI, we propose that appropriate crop breeding is vital to long-term success in smallholder farming communities. After identifying the need for alternative breeding practices, we worked with a plant breeder to adjust protocols and enhance plant-fungal partnerships, so offspring lines became more responsive to mycorrhizal fungi than parent lines, with subsequent yield advantages in low-input conditions (Cobb et al., 2021).

Our microbial analyses of farm soils in eastern Zambia indicated that microbial activity and potential benefits were impaired by local farming methods. This is linked to losses of soil carbon and nutrient use efficiency (Cobb & Wilson, 2018). Our efforts to restore grassland productivity and plant community diversity in northern China also revealed a strong link between belowground plant-microbial interactions and aboveground ecosystem stability (Zhou et al., 2019). These relationships are often underrecognized in food production and agricultural development strategies. *We suggest that locally available solutions provide the best returns.*

For example, compost inoculated with beneficial local microorganisms can be produced in many communities, and our research revealed these alternative inputs boost microbial activity and reduce fertilizer requirements while maintaining yields (Cobb et al., 2018a, 2018b).

### **Conclusions**

If agroecological researchers ignore the lessons of Rogers (2003) and other change theorists, they will likely produce methods, technologies, and innovations *inappropriate and/or detrimental* for communities in developing countries. In his parlance, unintended and undesirable consequences likely to spawn indirect consequences that are also negative (Rogers, 2003). Unique issues related to agricultural inputs, infrastructure, and the knowledge base of local farmers should be considered in all research designs (Navarro, 2008). Our results demonstrate that carefully assessed plant-microbial partnerships present an opportunity to enhance the sustainability of local agricultural systems through suitable crop genetics and improved farm soil management (Cobb et al., 2016).

### **Implications/Educational Importance**

Crops selected for microbial partnership and bred in low-nutrient soils may increase local production and food quality in developing countries. Resulting varieties provide relative advantage (Rogers, 2003) compared to fertilizer-dependent genotypes, potentially increasing the rate of adoption and prolonged utilization. Crop genetics and improved farming practices are fundamental and can be addressed locally through educational interventions emphasizing observability and trialability for potential adopters (Rogers, 2003). These strategies are best conceived and implemented as agricultural researchers consult with extensionists, and together with communities develop a feedback loop (Navarro, 2008) that is corrective, ethical, and purposeful.

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**Universities as Conveners in the Global Dialogue for Collective Action Toward More**

**Resilient Food Systems**

Carmen N. Benson  
Doctoral Candidate  
Texas A&M University  
Department of Agricultural Leadership, Education, & Communications  
600 John Kimbrough Blvd.  
College Station, Texas 77840  
706-627-5663  
cnbyce@tamu.edu

Danette Philpot  
PhD Student  
Texas A&M University

Keywords: Food Systems, University, Higher Education

## Introduction

At the current global trajectory, we will fail to meet the United Nations Sustainable Development Goal of *Zero Hunger* by 2030. Six hundred and sixty million (660 million) people are expected to face hunger in 2030 (FAO et al., 2021). The COVID-19 global pandemic has accentuated vulnerabilities in food systems resilience, exacerbating hunger, poor nutrition, and stunted agricultural productivity (FAO et al., 2021; Jayne et al., 2021). Responding to a recognition that global food systems, the way our food is produced, processed, stored, and sold, must transform to be resilient to shocks such as pandemics and changing climatic conditions, the United Nations (UN) Secretary-General hosted a Food Systems Summit in September 2021, to “raise ambition, increase our understanding of the problems we must solve, and set a course to radically transform our food systems” (UN, 2021). Leading up to the summit, stakeholders were encouraged to host Independent Dialogues to create open discourse, facilitate collective ideation, and to give voice to stakeholders from all regions and across food systems in the shared goal of strengthening food systems resilience. In the global fight against hunger and poverty, institutions of higher education are called to be leaders in innovation, to forge collaborative partnerships, and to provide evidence-based recommendations for effective policy change.

## Purpose and Objectives

Through a focused analysis of the convener roles at the recent Food System Independent Dialogues, this exploratory study aims to understand the role of universities during this critical period of global momentum around issues pertaining to food systems transformation and progress towards the Sustainable Development Goals. This study aims to both quantitatively assess the presence of universities in leadership roles as conveners and to identify emerging trends related to geographic focus areas, timing of university-convened Dialogues, and frequency of university-convened events, as well as to identify emerging themes around the focal areas of the Dialogues convened by universities. Specifically, the study responds to three questions:

1. How frequent is the occurrence of university-convened Independent Dialogues leading up to the start of the 2021 UN Food Systems Summit?
2. Which countries or regions are most often the focal geographic areas of the university-convened independent dialogues?
3. How does the frequency of engagement compare between universities from low, lower-middle, lower-high, and high income countries?

## Methods

Emerging from the more traditional quantitative content analysis, which generally involves the evaluation of frequency of word or theme occurrence, qualitative or mixed-method content analysis techniques support a deeper exploration of themes in written artifacts (Fraenkel et al., 2019; Dooley, 2007; Murphrey et al., 2018). Given the UN Food Systems Summit’s emphasis on transparency and access, all official Independent Dialogues are registered on a central website, with conveners strongly encouraged to submit Dialogue Reflection Reports following each event. The Dialogue details and reports are publicly accessible at <https://summitdialogues.org>. Data availability is dependent on the depth of reporting by each convener and is limited to those Independent Dialogues officially reported, thus limiting the breadth of this study.

Employing both quantitative and qualitative content analysis methods, this study analyzed all Independent Dialogues registered officially with the UN Food Systems Summit, beginning with the earliest published dialogue on 16 May 2020 and ending on 26 September 2021, the date of the UN Food Systems Summit. Only Dialogues with basic data available in English were included. Due to the limited search and sort option on the public-facing database housing the Dialogue details, researchers manually screened each Dialogue page, screening the convener fields for those convened or co-convened by at least one university institute. Prior to the artifact scan, researchers developed a data collection sheet with data fields aligned to the study objectives to manually enter the following for each university-convened dialogue: title, university convener name, university convener country, event language(s), unique identifying number, geographic focal area, number of participants, and keywords. Through basic quantitative analysis using Microsoft Excel, we determined the frequencies of: representation by country of university, country of content focus, and action tracks. For further quantitative analysis, we conducted a word frequency analysis from session titles. We are planning further qualitative analysis of session titles using the five UN Food Systems Summit Action Tracks as the constructs for a more granular thematic analysis (Krippendorff, 2018).

## **Results**

The results are briefly discussed in this abstract and will be presented visually and in more depth during the oral conference presentation. In total, 941 Independent Dialogue webpages were registered with the UN Food Systems Summit during the study period, of which 42 (4.4%) were excluded from screening because the event details were published in a language other than English. Of the remaining included Dialogues, 62 (6.8%) were found to be convened or co-convened by universities. In gauging the geographic focal areas of university-convened dialogues, the most cited regional foci, by most to least frequent were: African and the Middle East, Asia, “no border” or a global geographic focus, Europe, Australia and the Pacific, and North America. Of those that reported attendance, participation ranged from 27 attendees to 611 attendees, with the most-attended being the session titled “University-Policy Dialogue for Strengthening Agri-Food Systems in Africa” co-convened by the President of the Republic of Malawi and the Regional Universities Forum for Capacity Building in Agriculture, a Malawi-based university consortium.

## **Implications and Recommendations**

Though the brevity of this abstract does not allow for a deep dive into the results, what is presented through this exploratory study points to the significant role of universities in convening and leading Dialogues that contribute to the global collective action towards more resilient food systems. However, a more nuanced review of the results suggest room for increased engagement of universities, with US universities notably underrepresented among the conveners and very few collaborations between US universities and partner universities in developing countries. The next decade is crucial in reversing the current trajectory towards food insecurity and hunger. Universities, as global thought leaders, can play a central role in building synergies among stakeholders and reaching convergence on solutions for more resilient food systems.

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**Going the Distance: An Analysis of a Long-Term International Fellowship Program**

Meikah Dado  
Department of Agricultural Leadership, Education and Communications  
Borlaug Institute for International Agriculture  
Texas A&M University  
578 John Kimbrough Blvd. Suite 201, Office 215  
College Station, TX 77804  
[mdado@tamu.edu](mailto:mdado@tamu.edu)

Jessica R. Spence  
The Norman Borlaug Institute for International Agriculture

Jack Elliot, Ph.D.  
The Norman Borlaug Institute for International Agriculture  
Texas A&M University

*Keywords:* Experiential learning, development, Africa, agricultural education, fellowship

## **Going the Distance: An Analysis of a Long-Term International Fellowship Program**

### **Introduction**

AgriCorps was an American Fellowship program designed to connect agricultural professionals to school-based agricultural education in Ghana and Liberia (AgriCorps, 2021). Through AgriCorps, fellows served as agricultural educators, 4-H/FFA advisors, and Extension agents. (AgriCorps, 2021). AgriCorps has now phased into the International Agricultural Education Fellow Program, therefore the aim of this study was to better understand their experience and to make improvements on future fellowships and programs of the like, such as the Ford Foundation International Fellowships Program, Peace Corps fellowship programs, AmeriCorps teaching programs, and other international education fellowships.

### **Literature Review**

Previous scholars have researched the impacts of international experiences mainly through the lens of study abroad. These studies demonstrate evidence of study abroad's ability to increase student's personal growth, awareness, and intercultural competence, including cultural intelligence, sensitivity, and awareness (Byker & Putman, 2019; Soria & Troisi, 2013; Williams, 2005; Willard-Holt, 2001).

Although there is prevalent research suggesting short-term study abroad programs show positive impacts on personal and professional growth, there is a lack of research on long-term international fellowship experiences in education (Czerwionka et al., 2015; Harder et al., 2012; O'Malley et al., 2019; Rubenstein et al., 2018; Vatalaro et al., 2015).

### **Theoretical Framework**

To explore the experiences of AgriCorps fellows, this study used a lens of Kolb's theory of experiential learning theoretical perspective. This theory was influenced by John Dewey and Kurt Lewin. Kolb introduces the experiential learning model as a four-stage cycle including concrete experience, observation and reflection, abstract conceptualization, and active experimentation (Kolb, 1976).

### **Purpose and Objectives**

The purpose of this study is to better understand the international agricultural education fellowship programming of past AgriCorps fellows.

Therefore, the objectives of this study are to:

1. Define how the AgriCorps fellowship impacted their lives.
  - a. Experiences during the fellowship
  - b. Experiences post-fellowship
2. Make recommendations to future like-programs based on AgriCorps fellows' experiences.

## Methods

This phenomenological study included semi-structured virtual interviews with past AgriCorps fellows. We explored this sample through qualitative methods to capture, analyze, and understand participant experiences through their perspectives; however, we recognize the experience is not replicable to other populations (Denzin & Lincoln, 2005; Merriam & Tisdell, 2016; Seidman, 2006).

Over a three-week time period, we interviewed 18 participants via an online IRB-approved meeting platform due to the COVID-19 pandemic, time, and cost (Wright, 2020). We wrote the interview guide to include open-ended questions to understand the participants' experiences (Given, 2008). Questions included demographic information and space for fellows to describe their experiences, benefits, challenges, and the overall impact of the AgriCorps fellowship.

Data analysis included various procedures, including memos, field notes, recorded interviews, and concept-driven coding procedures using the constant comparative method as per Glaser and Strass (1967).

## Results

Based on our analysis, 12 themes and 64 sub-themes emerged. Together, these themes represent the collective AgriCorps fellowship experience.

The theme *Growth after Fellowship* articulates the fellow's thoughts and feelings after completing the fellowship. The sub-themes included: skill gain, value change, personal growth and confidence, professional career gain, career trajectory changed or affected, increased open-mindedness, cultural competency, interpersonal relationship skills strengthened, communicating and asking questions, international confidence and appreciation.

*Thoughts on AgriCorps Post Experience*, the next theme, described fellows' thoughts and views on AgriCorps after their experience was complete. Two contrasting sub-themes emerged: lack of impact and positive impact & appreciation.

The theme *Challenges* describes fellows' experiences and overcoming various challenges. The sub-themes included: challenges with community, challenges with loneliness, health, challenges with timeliness, feeling overwhelmed, witnessing traumatic events, safety threats in Liberia, challenges with food, challenges with teaching, and challenges with returning to the United States.

Another theme, *AgriCorps Responsibility* articulates how fellows felt AgriCorps held specific responsibilities. The sub-themes included difficulty with the organization's leadership, the first week generated varied responses, positive reflection towards training, stipend posed challenges, external support, expectations, and need for improved communication.

Fellows' accounts led to the *Discrimination* theme. Throughout their experience, fellows faced discrimination in a variety of ways both positive and negative. The eight sub-themes include



nationality-based advancement, female gender disparity, male gender advancement, race-based behavior change, perceived gender roles, female solidarity, race-based expectations, and feeling like an outsider while in-country.

The *Enjoyed the Culture* theme describes how fellows enjoyed the culture of their respective countries. The four sub-themes include community within culture, friendliness within culture, growth within culture, and West Africa vs. the US.

Another important aspect of the fellowship was *Reflection*. The sub-themes included negative feelings towards reflection, positive results towards reflection, Still Harbor aided reflection, and varied methods of reflection.

The theme *Developed Development Philosophy* described how fellows developed their own development philosophy during and after their experience. There were three sub-themes: longed for longer engagement, positive feelings toward AgriCorps development philosophy, and altered development philosophy.

Fellows described *Adjusting to Fellowship Life*. There were various aspects fellows adjusted to for their daily life in their respective community. The sub-themes included food, daily activities, adjusting to the culture, and hygiene.

The theme of the *Engaging Community* emerged as fellows found it important to engage the community. The sub-themes included daily operations, appreciated host family, experience with farmers, building rapport, lead by example, and engaging with students.

The theme *Language* describes fellows experiencing a language challenge was common for fellows to encounter. The sub-themes included want for increased language training, language barrier, and positive aspects

The final theme is entitled *Relationships Built*. Throughout their fellowship, fellows built relationships with a variety of people. The sub-themes included strong fellow bond, international friendships, and post-experience connections.

### **Recommendations**

This study adds to the literature about how international experiences contribute to participants' personal and professional growth (Czerwionka et al., 2015; Harder et al., 2012; O'Malley et al., 2019; Rubenstein et al., 2018; Vatalaro et al., 2015).

Our specific recommendations include ensuring programs provide language training, have protocols in place for sexual harassment and health emergencies, ensure access to mental health and reflection resources, and assist participants in adapting back into home country culture.

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**Lived Experiences of Aspiring Veterinarians: The *Essence* of an Undergraduate Study**

**Abroad Course**

**José M. Uscanga**

Oklahoma State University  
136 Agricultural Hall  
Stillwater, OK 74078-6031  
Tel. #: 405.744.5395  
jose.uscanga@okstate.edu

**M. Craig Edwards**

Oklahoma State University

**J. Shane Robinson**

Oklahoma State University

**Robert Terry, Jr.**

Oklahoma State University

**Udaya DeSilva**

Oklahoma State University

**Mariano Hernández Gil**

Universidad Nacional Autónoma de México

**Vivianne Perez Safady**

Universidad Popular Autónoma del Estado de Puebla

**Keywords:** career preparation, Mexico, phenomenology, pre-vet students

# **Lived Experiences of Aspiring Veterinarians: The *Essence* of an Undergraduate Study Abroad Course**

## **Introduction/Theoretical Framework**

Veterinary medicine has experienced rising rates of practice-related job dissatisfaction, distress, and incidents of suicide in recent years (National Research Council [NRC], 2013; Nett et al., 2015; Platt et al., 2012; Strand et al., 2005; Tomasi et al., 2019). Experts recommend that those seeking to join the profession have a broad understanding of its issues, opportunities, and challenges (Association of American Veterinary Medical Colleges [AAVMC], 2019; Chan, 2019; Lau, 2018; NRC, 2013). Most applicants to schools of veterinary medicine in the United States graduate with pre-veterinary concentration options. These *pre-vet students* devote significant effort, time, and money trying to fulfill application requirements during college, but only a small fraction will ultimately gain admission (AAVMC, 2020; AAVMC & Dabdub, 2020). In its general education curriculum, Oklahoma State University requires that undergraduate students complete at least one contemporary international culture course to learn about global issues and challenges, and many of these courses include an international travel component of about two weeks in length (Oklahoma State University, 2021).

If tailored to the veterinary profession, study abroad courses may help pre-vet students to better understand their future career path. Oklahoma State University offers one study abroad course tailored to pre-vet students. Studying abroad has been identified as a high-impact educational practice (HIEP) [Kuh, 2008] and “one of the most important experiences students can have as undergraduates” (Paige et al., 2009, p. 41). Geyer et al. (2017) concluded that short-term, study abroad courses have a positive impact on students’ leadership and career development. This investigation was undergirded by human capital theory (HCT) [Becker, 1962,

1994], interest-based motivation theory (IBMT) [Krapp et al., 1992], and person-environment fit (P-E. Fit) theory (Shen et al., 2003). This framework assisted in describing the *lived experiences* of pre-vet students who participated in a study abroad course to Mexico during the summer of 2019.

### **Purpose**

As part of a larger study, this phenomenological inquiry sought to describe the *essence* of pre-vet students' lived experiences regarding their participation in a study abroad course that introduced them to the practice of veterinary medicine in Mexico and to the nation's culture.

### **Methodology/Data Sources**

Phenomenology, a qualitative research approach, allows researchers to explicate and interpret the *essence* of a shared experience (Creswell & Poth, 2018; Moustakas, 1994). Through their phenomenological study, Mukembo et al. (2017) investigated the experiences of young, aspiring female agriculturists from Uganda who were members of young farmers' clubs. Their findings indicated that participation in the clubs' activities had transformative impacts on students regarding their choices to study agriculture (Mukembo et al., 2017).

Twenty-five undergraduate students from Oklahoma State University participated in a study abroad course tailored to veterinary medicine. The two-week-long course's learning activities exposed students to hands-on learning experiences, tours, places of interest, and presentations as well as to other veterinary students and practicing veterinarians from the United States and Mexico. The course included unique aspects of veterinary medical practice in Mexico and to the nation's culture. A journaling assignment in which students reflected on their learning experiences in Mexico provided the investigation's data.

Word frequency analysis was conducted on the aggregated text of the students' journals,

and the most frequently used words were noted. Textual analysis was done via open, axial, and selective coding to evaluate the contextual relevance of these words or qualitative codes (Creswell & Poth, 2018). Next, significant statements were identified and clustered into themes. The *essence* of students' writings, as derived from a range of representative statements and supporting codes, contextualized their *lived experiences* regarding the study abroad course.

### **Results/Conclusions**

Most of the written journal entries described a mix of the students' observations on veterinary medicine and culture, and five focused exclusively on culture. More than 300 significant statements emerged from the aggregated text of students' written journals; 32 themes were derived from these statements. Eight themes related to the practice of veterinary medicine in Mexico, such as access to care and work settings for veterinary practice. Seven themes arose related to the influence of culture on the practice of veterinary medicine in Mexico, including animals for work and functionality and the profession's tradition of giving back to the community, among others. Six themes highlighted the course's impact on students' career aspirations, e.g., broadening of career perspectives, learning of medical judgement, and learning on a range of veterinary procedures. And 11 themes reflected the students' observations on Mexico's culture.

Students perceived that the practice of veterinary medicine in Mexico was structured differently of that in the United States and the socioeconomic and agroclimatology conditions impacted the care of animals and the veterinarians' working conditions. They also perceived that socio-cultural views about the purpose of animals were significantly different. The course helped students to better understand the veterinary profession by actively engaging in culturally and contextually specific practices of veterinary medicine. *The study abroad course challenged*



*students' preconceived notions of the veterinary profession*. This encapsulated the phenomenon's *essence* (Moustakas, 1994). And consistent with HCT (Becker, 1962, 1994), the course contributed to enhancing students' understanding of veterinary medicine. In addition, students' interactions with the course's learning environment further informed their career aspirations and related motivations in accord with IBMT (Krapp et al., 1992) and P-E Fit theory (Shen et al., 2003).

### **Educational Importance, Implications, and Recommendations**

The study's themes demonstrated the importance of students experiencing an HIEP (Kuh, 2008). Students discerned the uniqueness of veterinary medicine in Mexico and identified some of its universal features (Geyer et al., 2017). Regarding the veterinary profession, little is more important than the career preparation, eventual job performance, and personal satisfaction over time of those who seek to become practitioners. Institutions of higher education, therefore, should develop and augment intentional and timely learning opportunities for undergraduate students to explore and better understand their interests in the veterinary profession. Additional research should also strive to further describe the *lived experiences* likely to influence pre-vet students' understanding of the veterinary profession, especially its unique challenges and opportunities.

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**Impact of an Undergraduate Study Abroad Course on Career Aspirations of Aspiring  
Veterinarians: A Retrospective Evaluation**

**José M. Uscanga**

Oklahoma State University

136 Agricultural Hall

Stillwater, OK 74078-6031

Tel. #: 405.744.5395

jose.uscanga@okstate.edu

**M. Craig Edwards**

Oklahoma State University

**J. Shane Robinson**

Oklahoma State University

**Robert Terry, Jr.**

Oklahoma State University

**Udaya DeSilva**

Oklahoma State University

**Keywords:** cross-cultural learning experiences, Mexico, pre-vet students

# **Impact of an Undergraduate Study Abroad Course on Career Aspirations of Aspiring Veterinarians: A Retrospective Evaluation**

## **Introduction/Theoretical Framework**

Veterinarians are an important human capital component of the U.S. agricultural industry and the nation's economy (Ouedraogo, 2018; USDA, 2020). The veterinary profession is a demanding occupation and has experienced increasing rates of practice-related distress, job dissatisfaction, and practitioner suicide rates in recent years (National Research Council [NRC], 2013; Nett et al., 2015; Platt et al., 2012; Strand et al., 2005; Tomasi et al., 2019). Experts recommend that aspiring veterinarians have a good understanding of the profession they seek to enter (American Association of Veterinary Medical Colleges [AAVMC], 2019; Chan, 2019; Lau, 2018; NRC, 2013).

Thousands of students apply annually to U.S. schools of veterinary medicine. Although a college degree is not required to apply, most seeking admission have graduated with a pre-veterinary curriculum concentration option, i.e., *pre-vet*. These students spend significant amounts of time, effort, and money trying to meet application requirements, but most will not be admitted (AAVMC, 2020a; AAVMC & Dabdub, 2020). Opportunities to better understand veterinary medicine could save these applicants significant psychological distress and financial investment, which may benefit the students and the profession. As such, studying abroad has been identified as one of several high-impact educational practices (HIEPs) [Kuh, 2008] and, according to Paige et al. (2009), “one of the most important experiences students can have during their undergraduate years” (p. 41). For example, Geyer et al. (2017) concluded that short-term, study abroad courses positively impact students' leadership and career development.

This study was underpinned by human capital theory (HCT) [Becker, 1962, 1994],

person-environment fit (P-E. Fit) theory (Shen et al., 2003), and interest-based motivation theory (IBMT) [Krapp et al., 1992] to interpret the impact of a study abroad course on pre-vet students' career aspirations to become veterinarians.

### **Purpose**

As part of a larger study, this quantitative portion sought to retrospectively evaluate the impact of a study abroad course on pre-vet students' career aspirations and related motivations.

### **Methodology/Data Sources**

A retrospective then-post evaluation (RTPE) procedure was used to collect data. Individuals' standards or metrics for measuring the learning content they experience may change between pretest and posttest observations because of factors not controlled for as part of an intervention, which may present potentially confounding variables and threats to a study's internal validity (Howard et al., 1979; Rohs, 1999). In addition, an intervention itself may shift the participants' self-evaluation perspectives, i.e., response shift bias (Howard et al., 1979; Rohs, 1999). RTPE has been used to enhance internal validity for self-report instruments measuring attitudinal and behavioral change (Howard et al., 1979; Rohs, 1999).

Twenty-five undergraduate students from Oklahoma State University traveled for two weeks to Mexico during the summer of 2019 as part of a study abroad course tailored to veterinary medicine. The course's learning activities were intended to expose students to hands-on learning experiences, tours, places of interest, presentations, and veterinary students and practicing veterinarians from Oklahoma State University and Mexico. A course evaluation in the form of an online survey questionnaire was sent to students after the study abroad course. Two questions described students' personal characteristics and six were Likert-type response items, e.g., "Before the trip and now that you've returned, how motivated were/are you to become a

veterinarian?” and “Before going on this trip and now that you have returned, how certain were/are you that you would attend veterinary school?” The two response scales ranged from *very motivated* to *very unmotivated* and from *very certain* to *very uncertain*.

Descriptive statistics, including frequencies, percentages, means, standard deviations, and skewness and kurtosis, were reported for data collected in the course evaluation. Inferential testing consisted of conducting a Wilcoxon Signed-Ranks Test for each of the Likert-type response items (Field, 2013).

### **Results/Conclusions**

Data were non-normally distributed according to levels of skewness and kurtosis. Mean differences were found between the students’ retrospective pre-course responses and their post-course answers. Inferential testing showed that the post-test mean scores were statistically significantly higher ( $p < .05$ ) than the pre-test mean scores for three of the evaluation questions: “Before the trip and now that you are back, how certain were/are you about your focus in veterinary medicine (small, large, exotic animals, wildlife)?” [ $Z = 85.500, p < .003$ ]; “Comparing what you learned on the trip and what you knew before, how knowledgeable did/do you feel about the veterinary profession?” ( $Z = 78.000, p < .001$ ); and “Before the trip and now that you’ve returned, how motivated were/are you to get good grades in college?” ( $Z = 15.000, p < .025$ ).

The course contributed to students’ understanding of veterinary medicine as a career option and profession, i.e., development of their human capital (Becker, 1962, 1994). Students’ interactions with the learning environment also appeared to have influenced their career aspirations, as postulated by IBMT (Krapp et al., 1992) and P-E Fit theory (Shen et al., 2003).

### **Educational Importance, Implications, Recommendations, and Application**



The impact of the course on students' understanding of veterinary medicine and their career aspirations in general, demonstrated the importance of providing them with HIEPs such as their study abroad course experiences (Abrams, 1979; Kuh, 2008). The RTPE demonstrated the posttest means of students' understanding of practice options and the veterinary profession significantly increased, as well as their academic motivation. An evaluation instrument that includes more detailed aspects regarding admission requirements to schools of veterinary medicine, understanding of practice options, and professional preparedness for the profession would help to further understand the course's value and its role in assisting pre-vet students to affirm or disconfirm their career choices. Sprecher (2004), asserted that "[v]eterinary medicine is at a crossroads" (p. 199). So, individuals seeking to enter the profession, their related preparation, their performance as veterinarians, and their long-term personal satisfaction are of paramount concern and importance. Institutions of higher education should provide learning opportunities needed for students to fully explore their interests in the veterinary profession while undergraduate students. Additional research should also seek to identify and facilitate learning experiences likely to improve pre-vet students' understanding of the veterinary profession, including potential challenges and rewards.

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## **An Evaluation of Graduate Students' Participation in High-Impact Learning Experiences**

Bradley M. Coleman  
Doctoral Graduate Assistant  
University of Florida  
PO Box 110540, Gainesville, FL 32611  
bradleycoleman@ufl.edu

J.C. Bunch  
Associate Professor  
University of Florida

Colby J. Silvert  
Doctoral Graduate Assistant  
University of Florida

*Keywords:* agricultural education, experiential learning, graduate students, high-impact experiences, high-impact learning

# **An Evaluation of Graduate Students' Participation in High-Impact Learning Experiences**

## **Introduction**

The Association of American Colleges and Universities has placed emphasis on students' engagement in high-impact experiences (HIEs) as part of their degree program (Kuh, 2008). Moreover, HIEs in international settings are necessary to prepare students for a globalized workforce (Lane & Murphrey, 2020). Through participating in HIEs, students can apply abstract content/theory practical, real-world contexts. Therefore, HIEs can deepen student learning and increase practical knowledge (Kuh & O'Donnell, 2013). Further, HIEs facilitate collaborative learning communities such as working with various faculty, project teams, potential employers, and peers (Kuh & O'Donnell, 2013). Multiple universities that house departments with specializations in school-based agricultural education, extension education, agricultural communication, and leadership development have adopted an emphasis on HIEs (NC State University, n.d.; Texas A&M University, n.d.; University of Florida, 2020). While HIEs are not a new approach, continued research on how to best implement HIEs in post-secondary settings is needed (Murphrey et al., 2016). Therefore, a formative evaluation (Rossi et al., 2019) was conducted at the University of Florida Department of Agricultural Education and Communication (UF AEC) to collect baseline data regarding the quantity and types of HIEs graduate students were receiving.

## **Purpose & Objectives**

The purpose of this formative evaluation was to determine the number of UF AEC graduate students who participated in at least two HIEs and to provide recommendations for improving the distribution of HIEs among graduate students. This evaluation had two objectives:

1. Identify the HIEs commonly encouraged by faculty.
2. Describe the amount of current graduate students who are participating in HIEs and the types and kinds of HIEs in which they have participated.

## **Methods**

The first round of data collection was for the purpose of instrument development. In round one, we asked faculty to compile a list of HIEs they believe to be appropriate for graduate students. Thirty faculty were invited to complete the questionnaire. The qualitative data were analyzed using the constant comparative method (Corbin & Strauss, 2015). Specifically, open coding, followed by axial coding was used to establish the six overarching themes of HIEs and situate individual HIEs within each overarching theme (Saldaña, 2016). This categorized list was then reviewed and confirmed by the UF AEC graduate committee. We then formatted the list into a Qualtrics questionnaire for the second round of data collection.

In round two, we collected quantitative data regarding graduate students' HIE participation. The target population for this sampling frame includes a census of currently enrolled UF AEC graduate students ( $N = 108$ ). This questionnaire was administered at the end of the spring 2021 semester, so all enrolled students were eligible and invited to complete the questionnaire. In total, 41% ( $n = 44$ ) of the students responded.

## Results

Objective one results included six overarching themes of HIEs that emerged from the open-ended faculty questionnaire: (a) teaching in formal settings, (b) teaching in nonformal settings, (c) research, (d) extension and outreach, (e) professionalism and service, (f) learning in formal and nonformal settings. In total, there were 53 non-duplicated HIEs that were situated within the six themes.

For objective two, we found 14 HIEs that 50% ( $n = 22$ ) or more of graduate student respondents had completed. In rank order, they were (a) participate in professional development ( $f = 33$ , 70.5%), (b) be part of a research team ( $f = 30$ , 68.2%), (c) analyze qualitative research data ( $f = 29$ , 65.9%), (d) learn how to use a new software ( $f = 29$ , 65.9%), (e) develop research instrumentation ( $f = 28$ , 63.6%), (f) collaborate with faculty to design a research study ( $f = 26$ , 59.1%), (g) participate in a domestic travel experience ( $f = 26$ , 59.1%), (h) collect qualitative research data ( $f = 25$ , 56.8%), (i) attend an academic conference ( $f = 25$ , 56.8%), (j) develop curricula resources ( $f = 24$ , 54.5%), (k) collect quantitative research data ( $f = 23$ , 52.3%), (l) analyze quantitative research data ( $f = 23$ , 52.3%), (m) participate in a course field experience ( $f = 23$ , 52.3%), (n) facilitate groups of learners/stakeholders ( $f = 22$ , 50%).

Additionally, there were 11 HIEs that 18% ( $n = 8$ ) of respondents or less had completed. In rank order by least completed, they were (a) participate in a study abroad ( $f = 3$ , 6.8%), (b) online teaching experience as lead instructor ( $f = 3$ , 6.8%), (c) author a manuscript for a popular press publisher ( $f = 4$ , 9.1%), (d) participate in service-learning ( $f = 5$ , 11.4%), (e) complete an international research study ( $f = 5$ , 11.4%), (f) mentor undergraduate researchers ( $f = 5$ , 11.4%), (g) deliver a research abstract or paper at an international conference ( $f = 7$ , 15.9%), (h) classroom teaching experience as lead instructor ( $f = 7$ , 15.9%), (i) conduct a program evaluation ( $f = 8$ , 18.2%), (j) participate in an internship ( $f = 8$ , 18.2%), (k) deliver a research abstract or paper at a national conference ( $f = 8$ , 18.2%). Lastly, we found that the average amount of HIEs completed by full-time students on assistantship ( $n = 29$ ,  $M = 20.21$ ) was slightly more than the amount completed by those who were part-time, self-funded students ( $n = 14$ ,  $M = 17.71$ ).

## Conclusions & Recommendations

Among the 14 most completed HIEs, none of the experiences were in the theme of extension and outreach, and only two HIEs were directly related to teaching in formal or nonformal settings. However, seven of the most completed HIEs were in the research theme. Thus, we recommend faculty ensure graduate students achieve a more balanced set of HIEs. Of the 53 HIEs, only three were directly related to an international context, all of which were in the list of least completed HIEs. Therefore, we recommend faculty promote participation in international HIEs (Lane & Murphrey, 2020). Follow up interviews should be conducted to explore students' perspectives about their access and barriers to HIEs. HIEs can be effective for deepening student learning (Kuh & O'Donnell, 2013); therefore, it is recommended that more departments within our discipline conduct evaluations of their students' engagement in HIEs and analyze trends across the profession.



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## **Using Children's Literature as a Gateway for Exploring International Culture**

Jennifer Strong  
Texas A&M University  
2116 TAMU  
College Station, TX 77843-2116  
[dr.jen@tamu.edu](mailto:dr.jen@tamu.edu)

Karly Anderson  
Texas A&M University

Barry L. Boyd  
Texas A&M University

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high-impact

# **Using Children's Literature as a Gateway for Exploring International Culture**

## **Introduction, Framework, and Literature Review**

New concepts presented to adult learners, in formal and informal education, can be difficult for the audience to comprehend and apply. Adding an international component to instruction often adds a layer of difficulty and, as such, it becomes the responsibility of international agricultural and extension educators to find new and innovative methods of communicating content.

For centuries, humans have used the art of storytelling to perpetuate culture and express complex ideas in easy to comprehend ways. One way storytelling is perpetuated throughout, between, and among generations is the use of children's stories (Amenumey & Grieman, 2009). Oral stories and histories are often captured and preserved in written, or literary form (McAdam, 2019). Using stories, in the domestic classroom, has proven effective in internationalizing curriculum (Pitts et al., 2010).

Increasing global literacy was identified as a priority for those engaged in international development work by The United Nations' Educational, Scientific, and Cultural Organization (UNESCO) (Richmond et al., 2008), and Nam and Fry (2010) took UNESCO's call further to suggest the idea of global literacy should extend beyond reading skills and include cultural intelligence, competence, and sensitivity. Based upon Knowles' et al. (1998) principle of andragogy and Kuh's (2008) high-impact learning objectives, an activity/assignment was developed to incorporate international children's literature into an existing applied ethics in agricultural leadership undergraduate course.

Exposing domestic students to international cultures not only positively impacts their ability to understand cultural relativism but also helps them perform more effectively in a culturally diverse society (Ingram & Radhakrishna, 2004). Amenumey and Greiman (2009) found using children's literature as a training tool within international agricultural extension was an effective way for students to synthesize their knowledge into a compelling story.

## **Purpose and Objectives**

The purpose of this innovative model of educational programming abstract is to describe a novel teaching method that makes difficult concepts more accessible and applicable to the adult learner by pairing topics with children's or young adult literature. The objectives of the activity/assignment were to: (1) increase students' ability to research other cultures, (2) increase students' critical thinking skills, and (3) provide a high-impact experience where students synthesize the chosen literature for cultural implications of class concepts.

## **Methods**

Understanding how morals and ethics are introduced, perpetuated, and reinforced is imperative to leading in diverse cultures. Undergraduate students in a course on applied ethics in agricultural leadership were presented the concept of children's literature as an introduction to cultural moral and ethical theories through two texts, *The Berenstain Bears and the Golden Rule* (Berenstain, 2008) and *That's Why We Don't Eat Animals* (Roth, 2009). Students were then charged to find examples, from other cultures, that were used to introduce, perpetuate, or reinforce morals and ethics. Attention was given to teaching students how to search out these texts, specific resources available from the Texas A&M University library, and how to translate texts. To ensure higher-order and critical thinking, students were given three guiding questions to reflect and apply course material. The answers to these questions were due before the next class meeting. In class, students were broken into small groups to share their findings, including the books and their answers. All small groups then shared with the entirety of the class. The results of the activity were also integrated into lectures and activities throughout the semester.

### **Results and Conclusions**

This activity/assignment proved to be effective as a high-impact andragogical practice. Ninety-five percent of students were able to summarize the story, extrapolate the "moral of the story", and discuss how the story introduces, perpetuates, or reinforces cultural ideals of morality and ethics. All students, in the course (N=125), were also able to articulate the impact culture has on culturally relevant morality. The results of this innovative teaching methodology support McAdam's (2019) conclusion that storytelling artifacts, in this case, children's literature, can create a knowledge exchange that differs from and improves upon traditional classroom activities.

### **Recommendations, Educational Importance, and Implications**

There are a few titles we recommend utilizing in education of adults in the sphere of international agriculture. One of these is *Beatrice's Goat* by (McBrier, 2004), a story based on the lived experiences of Beatrice, a young girl living Uganda who receives a gift from Heifer International. Beatrice receives a goat, and is therefore able to attend school, emphasizing the opportunities agriculture provides to education. *The Story of Ferdinand* (Leaf, 2011). Leaf provides an insight into the temperament of the bovine species, Spanish culture, and further disbands assumptions in animal science. Another selection of children's literature that could be used for adult education in agriculture is a picture book describing the history of science technology in China. Translated to English, this book is the "*History of Agriculture in Ancient Civilizations in China*" (Yuan, 2019). International agricultural and extension educators can provide titles for students based on specific cultures or contexts or can, as we indicated, ask students to find these examples on their own. The implications for this activity/assignment include increased high-impact experiences inside the classroom, higher-order and critical thinking, and a new, and non-threatening, way to introduce other cultures to domestic students all while furthering UNESCO's call.

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**Agricultural Education and Youth Migration: A Comparison of El Salvador, Honduras,  
and Ecuador**

**Authors**

Pablo Lamiño Jaramillo

Amy E. Boren Alpizar

Carla Millares Forno

## **Introduction**

The lack of income-generating opportunities, limited access to services, and inadequate community infrastructure have created conditions that impel rural youth to abandon their home communities and migrate to urban areas (Food and Agriculture Organization, 2018). In Latin America, 50 % of youth have expressed a desire to leave their communities of origin and try their luck in urban centers (Baez et al., 2017).

Salvadorian and Honduran youth migration is a recognized problem, and several reasons such as poverty, violence, insecurity, and family reunification in the cities have been identified as potential drivers of this phenomenon (Warren & Kerwin, 2017). In the case of Ecuadorian youth, important migration drivers include environmental degradation, community disputes, and lack of education and employment opportunities in rural areas (Latin American Center for Rural Development, 2017).

Education has an important influence on the migration process because rural people who obtain a higher level of education tend to leave their communities (Corbett, 2007). Nevertheless, agricultural education programs in Latin America's rural places can reduce the desire to migrate by teaching youth how to take advantage of their communities' resources and improve their lifestyle (Rodríguez-Vignoli & Rowe, 2018). Agricultural education programs in Latin America can teach students about better agricultural practices, encourage them to replicate new techniques, and potentially reduce youth migration (Rhoda, 1983).

## **Purpose and Objectives**

This study aims to identify and compare the migration intentions of high school students in agricultural programs (AGP) and non-agricultural programs (non-AGP) in three rural communities, one from El Salvador, one from Honduras, and one from Ecuador. This study was

framed by the Theory Planned Behavior (TPB), which examines people's intentions to act based on their attitudes, subjective norms, and perceived control over the act (Ajzen, 1991). The research questions answered in this study are:

1. 1. Compare students' intention to migrate by country and academic program
2. 2. Determine the main and interaction effects of country of origin, academic program, gender, intention to migrate based on the different migration drivers.

### **Methodology**

For this quantitative study, a non-probabilistic convenience sample was utilized. The target population ( $N = 408$ ) was composed of high school students from three rural communities with similar socio-economic characteristics in El Salvador ( $n = 104$ ); Honduras ( $n = 105$ ); and Ecuador ( $n = 199$ ). Within each community, participants were divided into two groups, one group participating in a formal AGP, and other group involved in a non-AGP.

A 50-item paper-pencil survey was designed, validated, and used to collect demographic information, participants' academic and agricultural background, migration drivers, and intention to migrate. For the "Migration Drivers" section, 34 5-point Likert-type questions were designed to measure the following: Social Participation, Social Support, Access to Extension Activities, Environmental Impacts, Interpersonal Ties, Disputes, and Subjective Expectations. The drivers were chosen based on existing literature (Yazdan-Panah et al., 2017; Lamiño Jaramillo et al., 2021).

The instrument was previously implemented in other Latin American countries to increase its validity. Expert recommendations included adapting the instrument to the context of each country to make sure the questions would be transferred and understood correctly. Cronbach's alpha was calculated to measure constructs' reliabilities. Results ranged from .70 to



.87, indicating the constructs were acceptable (Rubin & Babbie, 2009),

Descriptive statistics were used to understand the participants. For objective one, two independent Chi-squares were conducted to compare migration intention depending on the country of origin and academic program. For objective two, a 3 x 2 x 2 x 3 Factorial MANOVA was used to examine the main effects and interaction effects of the independent variables: country of origin, academic program, gender, and intention to migration on the eight migration drivers.

### **Results and Conclusions**

The sample consisted of 199 AGP and 209 Non-AGP students. In El Salvador, most of the participants were from AGP ( $n = 54$ , 51.9%), while in Honduras and Ecuador, most participants were from non-AGP ( $n = 55$ , 52.4% and  $n = 104$ , 52.3% respectively). Higher female participation was obtained in Ecuador and Honduras ( $n = 109$ , 54.8% in Ecuador; and  $n = 64$ , 61.0% in Honduras). Most of the participants in El Salvador were males ( $n = 65$ , 62.5%).

The Chi-square analysis evaluated youth intention to migrate based on their country of origin and educational program. Overall results for country of origin indicated the majority of Salvadorian youth (56.73%) considered migration a viable option, while the majority of Honduran (36.27%) and Ecuadorian (49.74%) youth have no intentions to migrate.

In general, for academic programs 46.7% of AGP students have no intention to migrate, followed by 29.6% of undecided, and 23.6% who are not planning to migrate. For non-AGP students, 39.8% consider migration as an option, followed by the 34% that have no intention to migrate, and 26.2% of undecided students.

Results from the MANOVA showed that “Access to Extension Activities”, “Social Expectations”, and “Environmental Impacts” constructs were significantly different ( $p < 0.05$ )

for youth intention to migrate. Youth with high migration intentions have less access to extension activities, high expectations of opportunities in the city, and had been influenced by environmental impacts compared with those who are undecided and those who have no intention to migrate. The other drivers did not have a statistically significant effect on youth migration intentions.

### **Recommendations**

Results showed that rural youth in AGP have a lower intention to migrate than those who are in non-AGP program. Access to extension activities was determined to be a migration driver. It is recommended to invest in extension activities targeting youth that could combat youth intentions to migrate.

Many youth participants were undecided about migrating, providing an opportunity for extension to influence their decisions. Designing programs to increase youth involvement in community activities could be helpful in enhancing decisions to remain in the community.

Environmental impacts were also a migration driver in youth migration intentions. Extension programming should engage youth in addressing the environmental issues rural communities are facing to reduce the influence of this driver on youth intentions to migrate.

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**Student Assessments of Virtual Reality Equine Curricula: Results from COVID-19  
Induced Cyber Instruction**

Robert Strong  
Texas A&M University  
600 John Kimbrough Blvd  
College Station, TX 77843  
[robert.strongjr@ag.tamu.edu](mailto:robert.strongjr@ag.tamu.edu)

John Mark Palmer III  
Jennifer Zoller  
Texas A&M University

Keywords: agricultural education, horse judging, evaluation, digital simulations

## **Introduction and Theoretical Framework**

Research and evaluation are essential to better comprehend the outcomes of virtual instruction on student learning (Lindner et al., 2020). The sudden shift to pervasive virtual learning due to the pandemic necessitates the assessment of student learning from quickly adopted digital technologies (O'Neill et al., 2021). Fussell and Truong (2021) indicated virtual reality (VR) technologies are being included into courses to develop students in safe and organized scenarios for post-graduate success in complex circumstances. VR research is needed to explain the optimization of student performance and student experiences with VR with respect to technology's latency (Dzardanova et al., 2021). Virtual instructional technologies can improve student learning and engagement when used correctly (Bumguardner et al., 2014).

Kirkpatrick and Kirkpatrick's (2006) four-level evaluation includes reactions, learning, behavior, and results to assess learning outcomes. Reactions is the extent participants respond positively to the content. Learning indicates the degree participants increased knowledge. Behavior understands how students apply what they learned. Results are the achievement of learning outcomes (Kirkpatrick & Kirkpatrick, 2006, Miller, 2018). The goal of evaluations is to understand the effectiveness or impact a program has produced on the target audience (Strong et al., 2021). The advantage of the four-level model is the focus on students' feedback, measuring learning improvements, and impact of program outcomes (Chen et al., 2021; Irby et al., 2012).

The technology acceptance model (TAM) identifies attributes predicting an individual's adoption of technology (Davis, 1989; Irby & Strong, 2015). TAM involves two key attributes for examination. Perceived usefulness explains user's belief the extent the technology will enhance their respective performance. Perceived ease-of-use outlines individual's certainty of the effort it takes to adopt the technology (Davis, 1989; Strong et al., 2013).

## **Purpose and Objectives**

The purpose was to assess student learning from VR acceptance through the four-levels evaluation model. Participants were enrolled in an equine selection course and the VR lesson was Horse Judging – Stock type Halter and Western Pleasure Classes. The objectives were:

1. Assess student's learning outcomes from VR use.
2. Analyze student's VR ease-of-use in horse judging.
3. Discern student's suggestions for improving VR horse judging curricula.

## **Methods**

Twelve ( $n = 12$ ) out of eighteen ( $N = 18$ ) total students chose to participate (66.67% response rate) in this study. The researchers employed a mixed-methods research design to answer the study's objectives. Mixed methods permit researchers to tackle multifaceted research objectives, develop responses to both exploratory and confirmatory inquiries within one study, and unveil a more complete depiction of a contextual issue (Ivankova & Wingo, 2018). A mixed-method design incorporates narratives and numerical data (Fraenkel et al. 2019).

Student's learning objective was to understand and apply guidelines for judging Halter and Western Pleasure equine classes. The Tailored Design Method (Dillman et al., 2014) is the foremost data collection strategy to gather participant electronic data. A Qualtrics instrument including the Attitudes toward Virtual Reality Technology Scale (AVRTS) (Bunz et al., 2020) was used to assess attitudes. Qualitative responses were assessed for trustworthiness and credibility as recommended by Dooley (2007). The researchers implemented the TDM to collect data and develop themes based on Braun and Clarke's (2006) recommendations. Nonparametric statistics were used to examine quantitative data and answer the first and second objectives (Fraenkel et al., 2019).

### **Results**

Most respondents ( $n = 10$ , 83.33%) somewhat to strongly agreed VR horse judging technology improved their learning. Eleven ( $n = 11$ , 91.67%) of twelve participants indicated they could apply what I learned from the virtual technology in a horse judging contest. Seven respondents at least somewhat agreed VR taught them to effectively apply standards to judge each horse class. Eight respondents agreed they could apply what they learned from the virtual technology in real life evaluations.

Participants reported diverse attributes of virtual technology's role in horse judging. R7 included "A benefit would be you have the horses right in front of you whereas in real life they are somewhat farther away." R6 conveyed virtual reality technology "Provides a more realistic experience compared to watching a recording. It gave you a more realistic look at the horses while teaching you how to keep scanning the class in rail events to simulate a contest scenario."

The benefit of convenience and not traveling was indicated by participants, R4 added, "Even when you can't physically go see the horses this allows the judge to get close and have a greater grading." R1 explained VR benefits further,

"Using virtual technology allows you to feel more like you are judging horses live. You are able to practice watching all the horses moving at once, like you have to do in a judging contest. It also allows you to practice time management while you look at the horses."

The third objective centered on student's feedback to improve the VR curricula. R1 suggested, "I think distance from the camera is important. I felt more nauseous the closer the horses were moving toward the camera." R6 responded with

"I would suggest for the halter classes, the horses should be further away from the camera, so you can get a better idea of how you would like to place the class. They should also be set in a line like they are in a judging contest so you have to walk down the line of horses to evaluate them. For the Western Pleasure class, maybe the footage could be filmed in a bigger space as well, instead of a round pen."

### **Recommendations and Educational Importance**

International agricultural educators' assessment of ubiquitous virtual instructional technologies will be necessary long after the pandemic is over. Across the world, the pandemic still wreaks

havoc on student learning as the new normal of education has evolved. Global agricultural educators should discern the extent VR instructional technologies may be applicable for digital delivery to meet their learning objectives (Klerkx et al., 2021). VR technology will continue to progress and the technology's ability to offer digital simulations are beneficial in increasing knowledge in large global issues such as climate change, food security, and public health.

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**Sustainable Agriculture: Relationship between Knowledge and Attitude among  
University Students**

**Authors**

Carlos Durán, Bernardo Trejos

Amy E. Boren Alpizar

Pablo Lamiño Jaramillo

## **Introduction**

Sustainable Agriculture (SA) is a complex and challenging term to define (Hayati et al., 2010; Hoffman et al., 2014; Sydorovych & Wossink, 2008) because each agricultural impact occurs in different ways and the synergy between its components is unclear (German et al., 2017). Sustainability in agricultural systems involves concepts of resilience and persistence and considers effects in the economic, social, and environmental domains (Garibaldi et al., 2017; Pretty, 2008). Weiner (2017) highlights SA as one of the biggest challenges facing humanity.

People's knowledge and attitudes play a decisive role in SA (Karami & Mansoorabadi, 2008; The World Bank, 2005); understanding the relationship between sustainability aspects is helpful (German et al., 2017). Studies have attempted to quantify attitudes and knowledge of SA in various regions and target populations, with farmers as the majority (Hoffman et al., 2014; Karami & Mansoorabadi, 2008; Onduru & Du Preez, 2008; Petzelka et al., 1996; Šūmane et al., 2018). In the future agricultural students may influence farmers' adoption of SA practices (Ankamah et al., 2021).

Specific communities outside the classroom hold certain knowledge systems which can impact student learning experiences of SA (Murakami et al., 2016). Furthermore, university students' practical learning motivates them (Parr & Trexler, 2011) and leads to understanding and appreciation for SA (Battisti et al., 2008). Including SA in the curriculum could bring alternatives to solve production-associated environmental issues (Sitienei & Morrish, 2014).

However, there is little research regarding education in SA (Parr & Trexler, 2011) and determining students' understanding to inform curriculum revision (Ankamah et al., 2021). Moreover, there is a gap as to sustainable agricultural education in Latin America. This study

intends to contribute to this research stream through an instrument adjusted to the region's particularities. This study focused on university students because they will become leaders and decision-makers in the future (Ahamad & Ariffin, 2018; Moore, 2005).

### **Purpose and Objectives**

This study aims to compare agricultural-based university students' sustainable agricultural attitudes and knowledge and determine if there is a relationship between both constructs. Three specific objectives shaped the study:

- 1) To analyze students' attitudes towards SA and its association with gender.
- 2) To evaluate students' knowledge of SA and its relationship with perceived knowledge.
- 3) To determine the relationship between knowledge of and attitude towards SA.

### **Methods**

For this quantitative, non-experimental, and correlational study, the data was formed of 374 students from 21 different countries at a Honduran university. The sampling was non-probabilistic. Participants' attitudes and knowledge were assessed using a survey that included demographic questions, 15 statements with a 5 level – Likert-type scale for attitude, and 15 multiple choice questions for knowledge. For the attitude section, a Cronbach's alpha test was implemented ( $\alpha = .75$ ). Also, the significance level used for all inferential analyses was  $\alpha = .05$ .

For objective one, a Mann-Whitney test was used to determine the association between attitude towards SA and gender. For objective two, a simple linear regression was used to measure the level of prediction of the actual knowledge from the perceived knowledge of SA. For objective three, the attitude and knowledge sums were categorized into high, moderate, and low. A Chi-square test was conducted to determine if the responses were adjusted to a

theoretically expected distribution. Finally, a Spearman correlation test was used to establish the association between attitude and knowledge of SA.

### **Results, Products, and Conclusions**

Most participants were men (54.3%) and undergraduate students (96.5%). Participants were asked about their level of agreement with the attitude statements. In general, the results revealed that students who participated tended to have a positive attitude towards SA. Moreover, most participants agreed with the general well-being of field workers (96.0%), crop rotation benefits (93.8%), and product diversification to avoid monoculture dependence (92.0%). Attitude's mean was 62.73 ( $SD = 6.39$ ). Thus, the majority of participants showed positive attitudes ( $n = 269$ ; 71.9%). No association was found between gender and participants' attitude towards SA ( $p = .17$ ).

Regarding knowledge, most participants know human well-being goes beyond income (97.1%); an environmentally sustainable crop implies producing what the environment can handle without generating a negative impact (96.0%); soil quality depletion will affect food production capacity in the future (93.6%). Most participants did not consider resilience as the capacity of the systems to buffer impacts and disturbances (67.6%), and that an economically sustainable crop is profitable (50.8%). Knowledge overall mean was 10.95 ( $SD = 2.13$ ). The majority of students possessed medium knowledge of SA ( $n = 232$ ; 62.1%). A simple linear regression was conducted to predict the actual knowledge from the perceived one,  $\beta = .271$ ,  $t(372) = 5.429$ ,  $p < .001$ ; ( $F(1, 372) = 29.473$ ),  $p < .001$ , with an  $r^2 = .074$ . Although significant, assessed knowledge only explains 7.4% of the variation in perceived knowledge.

An independent Chi-square test was used to determine the relationship between

knowledge and attitude toward sustainable agriculture. Participants with a medium level of knowledge tend to have a high attitude ( $\chi^2 = 25.568$ ;  $df = 1$ ;  $p = .000$ ). A Spearman correlation was run between attitude and knowledge, resulting in a low positive relationship ( $r_s = .252$ ;  $p = .000$ ).

The majority of the students that participated in the study had a positive attitude towards sustainable agriculture, regardless of gender. The level of knowledge among most participants was medium, but their perceived knowledge did not predict assessed knowledge. Finally, the relationship between attitude towards and knowledge of SA was positive but low, where students with a medium level of knowledge tend to have a positive attitude.

### **Recommendations, Educational Importance, and Implication**

Improving university students' attitude towards and knowledge of SA requires it to become a cross-cutting component in agricultural education. For instance, profitability, risk reduction, and resilience could be enhanced by including them in the curriculum and complementing them with action learning. More importantly, future research should address other factors that could influence the attitude and knowledge of SA (i.e., teachers' knowledge and attitude towards SA, environmental behavior, and educational approaches).

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**Elements of Globally Competent Teaching in Pre-Service & In-Service Agricultural Educators after Participation in a Maymester Study Abroad Program to Jamaica**

**Melissia A. Grant**

Purdue University

915 W. State Street

West Lafayette, IN 47907-2054

765-494-8433

[grant8@purdue.edu](mailto:grant8@purdue.edu)

**Sarah E. LaRose, Ph.D.**

Purdue University

**Mark A. Russell, Ph.D.**

Purdue University

**JoAnn Phillion, Ph.D.**

Purdue University

**Keywords:** global competence; empathetic dispositions; agricultural education; transformative learning; teacher education

## **Introduction**

Our connected, globalized society is increasingly dependent upon economic, political, cultural, environmental, and technological interconnectedness (Hull, 2018). In addition to effectively differentiating instruction, global competency has become an increasingly pressing concern for public education as the American society gradually becomes more diverse. With an increase in the number of students born outside the United States, classroom educators are tasked with adopting new strategies to create an environment that can effectively engage ethnoracial minorities. As enrollment trends change the overall composition of United States public schools, teacher education programs have worked in recent years to increase global competency among the skills needed for beginning teachers (Quezada, 2004; Asia Society/OECD, 2018). However, in many settings, the population of teachers is not reflective of the diverse populations of their students, and few teachers are confident in their abilities to teach diverse students (McClellan-Kirksey, 2020). As such, there needs to be more emphasis on instructing teachers with new strategies to reach students whose racial, cultural, and linguistic backgrounds may differ from their own (Tichnor-Wagner et al., 2019).

## **Theoretical Framework**

Mezirow's (1978a, 1978b) Transformative Learning Theory (TLT) served as the theoretical framework for this study. With an association to adult learning and andragogy, Mezirow's work posits that adults learn best by making meaning of their lived experiences. As learners begin to process and change their personal views of the world, individuals ultimately form new perspectives and make meaning of information differently. Mezirow (1991) explains that while the achievement of knowledge may be transformative in its regard, it is when knowledge is combined with hands-on experiential learning that more "meaningful ways" can be discovered. Mezirow (1991) highlights the focus of the transformative learning theory on the advancement and adaptation of ones' individual beliefs, attitudes, and emotional reactions.

## **Purpose and Objectives**

The purpose of this study was to examine how participation in a short-term study abroad can impact teachers' empathetic dispositions as they relate to globally competent teaching practices. The objectives that guided this study were:

1. Describe the demographics of the study participants, including employment/educational status, race, and additional international experiences.
2. Identify study abroad participants' self-rated stage of empathy development utilizing the Globally Competent Teaching and Learning Continuum.
3. Explore themes pertaining to empathy within study abroad participants' rationale for self-rating on the Globally Competent Teaching and Learning Continuum.
4. Explore themes pertaining to empathy within study participants' response concerning the steps necessary for movement along the Globally Competent Teaching and Learning Continuum.

## **Methods**

This study used an explanatory sequential mixed methods research design to examine how participation in a short-term study abroad can impact teachers' empathetic dispositions related to globally competent teaching practices. Agriculture education majors from Purdue University who participated in a short-term study abroad to Jamaica from 2015-2019 were considered as the

population of this study (N=80). Participants were first asked to respond to an online Qualtrics® questionnaire that utilized an unmodified version of Tichnor-Wagner et al.'s (2019) Globally Competent Teaching and Learning Continuum and demographic questions that addressed non-identifying information. The online questionnaire was administered utilizing Dillman's (2014) Tailored Design Method and served as the foundation for the subsequent qualitative piece.

Following the online questionnaire, four virtual follow-up focus groups were conducted via Zoom® to further explore the collection and analysis of study participants' self-rated stage of empathy development. Three groupings (i.e., pre-service teacher, in-service teacher, and other) emerged from the quantitative data analysis and were vital in forming the virtual follow-up focus groups. Intelligent transcription was utilized to transcribe the qualitative data, and study participants were contacted to assess the audio transcript through an interviewee transcript review.

### **Results**

For this study, a completed response was one in which 100% of the questionnaire had been completed. Fifty-six participants consented to participate, and after the removal of incomplete questionnaires, thirty-six were usable for a final response rate of 45%. Quantitative frequencies and descriptive statistics were ran using SPSS© version 26, while qualitative themes were analyzed using NVivo Pro©, version 12.3

**Objective 1-**Agricultural education undergraduates who participated in the short-term study abroad to Jamaica were representative of three demographic categories (i.e., pre-service teacher, in-service teacher, and other). Most participants identified as white and had little to no international experience before the short-term study abroad.

**Objective 2-**Study participants reported a relatively high level of confidence within their self-rated stage of development for empathy and valuing multiple perspectives (M=3.58).

**Objective 3-**Various internal and external factors exist within study participants' rationale for self-rating along the Globally Competent Teaching and Learning Continuum. Consistent across all demographic categories were the external factors of family expectations/upbringing and transformative experiences.

**Objective 4-**Various internal and external factors exist within study participants' response concerning the steps necessary for movement along the Globally Competent Teaching and Learning Continuum. Consistent across all three demographic categories was the external factor of resources from alternative perspectives.

### **Implications/Recommendations**

Overall, participants acknowledged the transformative experience during the short-term study abroad to Jamaica as an external factor for building competence in the dispositions element of empathy and valuing multiple perspectives. However, this cannot be the only contributing factor for teachers to prepare the next generation of globally competent students. Based on the results, advancing curriculum within globally competent teaching practices and professional development for teacher candidates and in-service agricultural educators were two major areas in which this study was significant.

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**A Whole New World: The Motivations of Parents of First-Generation College Freshman in  
the Louisiana State University College of Agriculture Regarding their Child Studying  
Abroad**

**Authors**

Lacey Roberts, Ph.D.  
New Mexico State University  
[lnrob@nmsu.edu](mailto:lnrob@nmsu.edu)

Richie Roberts, Ph.D.  
Louisiana State University  
[roberts3@lsu.edu](mailto:roberts3@lsu.edu)

# **A Whole New World: The Motivations of Parents of First-Generation College Freshman in the Louisiana State University College of Agriculture Regarding their Child Studying Abroad**

## **Introduction**

High-impact learning experiences have been critical to student success in higher education. Study abroad courses have been recognized as one of the most successful high-impact learning experiences that can provide valuable skill-building opportunities (Kuh, 2008). For example, previous research in agriculture has reported that study abroad courses can facilitate students' (a) improved cultural competence, (b) maturity in global perspective, and (c) ability to work with diverse groups (Conner & Roberts, 2015; Roberts & Edwards, 2016). Before the COVID-19 global pandemic, over 347,000 students studied abroad in the 2018-2019 academic year (Institute of International Education, 2021). Of these students, only 27% identified as a first-generation college student (Institute of International Education, 2021). Unverferth et al. (2012) argued that first-generation college students experience multiple barriers that prevent them from engaging in international experiences, such as less knowledge about opportunities and a lack of financial assistance. The parents of first-generation college students have also been shown to dissuade children from participating in study abroad courses because of their lack of knowledge and negative attitudes about other cultures (Rausch, 2017). Therefore, a need emerged to examine the parents of first-generation college students regarding their child studying abroad.

## **Theoretical Framework**

We used Eccles et al. (1983) expectancy-value model of achievement motivation to frame this investigation. Eccles et al. (1983) theorized that individuals' subjective task-values influence their achievement-related choices and performance (Eccles et al., 1983). Four key values have described these subject task-values: (1) attainment value; (2) intrinsic value; (3) utility value; and (4) cost value (Eccles et al., 1983).

## **Purpose**

This investigation aimed to examine the motivational beliefs of parents of first-generation first-year college students in the Louisiana State University College of Agriculture (CoA) regarding their child studying abroad.

## **Methods/Data Sources**

In this investigation, we used a Q methodological approach. In Q, researchers seek to interrogate participants' beliefs on a phenomenon using a blend of qualitative and quantitative methods (Brown, 1980). To achieve this, researchers collect data through a Q-Sort technique, in which participants sort statements from *Like Me* to *Unlike Me* onto a quasi-normal distribution. The statements were adapted from Roberts et al. (2020), who created 154 original statements from in-depth interviews with freshman CoA students and parents. Roberts et al. (2020) also drew on Eccles et al. (1983) expectancy-value model of achievement motivation to negotiate and distill the statements into four theoretical categories – a process that yielded a sampling of 36 statements. The statements were slightly adapted to fit the context of this investigation.



To collect the data, we asked 20 parents to sort the 36 statements on a quasi-normal distribution ranging from (+4) *Like Me* to (-4) *Unlike Me*. The data were then uploaded into PQ Method® version 2.35 (Schmolck, 2014). Thereafter, we performed the following statistical tests: (1) correlation, (2) principal component analysis, and (3) computation of factor scores. Then, we used Varimax rotation to achieve a simple structure. Our analysis of the data resulted in a four-factor solution with a base significance of .42. This solution represented all 20 parents, who loaded significantly and purely on only one factor while capturing 71% of the total variance. Correlations among the factors were negligible. Finally, we used Mauldin's (2012) approach to examine array positions, consensus statements, factor loadings, and the parents' individual characteristics to emerge their motivations.

### **Results/Conclusions**

Through our analysis of the data, four factors emerged that represented the motivations of parents of first-generation college students regarding their child studying abroad: (1) *Conflicted Parents*, (2) *Personal Growth Focused Parents*, (3) *Equity Focused Parents*, and (4) *Financially Focused Parents*. The in-text notations in this section represent the corresponding: (a) statement number, (b) array position, and (c) z-score. The *Conflicted Parents*, comprised of four males and two females, represented a perspective in which they perceived their child participating in study abroad course could help them gain a greater appreciation for different cultures (30, +4,  $z = 1.89$ ). On the other hand, they also maintained that the potential emotional toll of the international experience on their child would likely serve as a barrier to their participation (30, +4,  $z = 1.82$ ). Meanwhile, the *Personal Growth Focused Parents* maintained that if their child studied abroad, it could help them become a better person (4, +4,  $z = 1.77$ ). Further, the parents also suggested that they wanted their children to have an experience abroad to gain a better perspective of how the world functions outside of the U.S. (6, +4,  $z = 1.59$ ). *Equity Focused Parents* perceived that study abroad was critical so that their children could better understand what it means to be underprivileged (8, +4,  $z = 1.74$ ). They also hoped their children could use their new perspective to create positive change in the world (5, +4,  $z = 1.56$ ). The last factor, *Financially Focused Parents*, suggested that the cost of international experiences would discourage their children from participating (10, +4,  $z = 1.93$ ). They also perceived that their children would not find a study abroad course aligned with their interests on a limited budget (1, +4,  $z = 1.86$ ).

### **Implications/Recommendations/Educational Importance**

Because parents have been shown to be critical to influencing first-generation college students' motivations to study abroad (Rausch, 2017), this investigation expanded knowledge on this phenomenon. For example, in this study, four factors emerged that represented the diverse perspective of parents. It should be noted that findings were limited to data from one university. Therefore, the findings should not be generalized more broadly. Moving forward, we recommend that Louisiana State University CoA use the four factors identified in this investigation to create tailored educational and promotional materials for first-generation students and parents. We also recommend that agricultural faculty who lead study abroad courses dedicate time to speak to parents about how the experience could expand their child's personal growth and understanding of equity. Finally, financial assistance and scholarship opportunities for studying abroad should also be communicated more clearly to parents of first-generation college students.

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# **Opportunities and Challenges of Students at Auburn University**

**Tracy James**

Department of Curriculum and Teaching

College of Education

Auburn University, AL 36849-5212

[tcj0019@auburn.edu](mailto:tcj0019@auburn.edu) 1-347-481-9057

**Akua Adu-Gyamfi**

Auburn University

**Makeda Nurradin**

Auburn University

**Da Hao**

Auburn University

**Jason McKibben**

Auburn University

**James Lindner**

Auburn University

Key Words: Opportunities, challenges, satisfaction

## **Introduction**

Every academic year universities in the United States receive hundreds of thousands of international students from across the globe. Statista (2021), reported over 800,000 international students attended American universities in the academic year 2019/2020. International students enroll in U.S. institutions due to the availability of programs that they want to pursue. They also see this as an opportunity to have career and work prospects by attaining an education in the United States (Roy et al., 2016). International students also face a myriad of challenges when seeking higher education in the United States. Prior studies have listed academic life, health insurance, transportation, social interactions, accommodation, and discrimination as some of the barriers international students face during their initial transition into the United States (Poyrazli & Grahame, 2007). Research work has revealed that the challenges these international students face in settling into higher education may impact on students' academic and psychological well-being (Barratt & Huba, 1994).

## **Purpose**

The purpose of this study is to examine the opportunities and challenges international students experience while studying at [city] university.

## **Theoretical Framework**

This study used a problem-solving approach with a focus on socio-cultural adaptation. Socio-cultural adaptation is based on how effectively an individual link to their new environment, such as competence in managing tasks required for daily intercultural living (Ward et al., 2008). Socio-demographic variables, such as education level, academic performance, prior cross-cultural experience, language proficiency, family income and perceived cultural distance influence successful adaptation to an environment. Findings in the problem-solving research have suggested that international students have problems communicating with others in English, especially in academic setting (Andrade & Evan, 2009; Olivas & Lee, 2006; Ward & Kennedy, 1992). Social and cultural challenges including social integration, isolation, homesickness, financial crisis, and family stress (Mallinchrodt & Leong, 1992), lack of social support (Poyrazli et al., 2004; Ward et al., 2008) and challenges in establishing relationships outside of their shared ethnic community (Olivas & Lee, 2006; Ward et al., 2008), specifically a lack of social support within the host community.

## **Methodology**

Primary data were collected through the use of questionnaires created in Qualtrics and distributed to post-secondary graduate international students at [City] University via email. There number of students that responded to the survey were 32, and 30 responses were viable for data analysis. The questionnaire consisted of demographic questions, questions related to their program, questions related to the opportunities they seek and the challenges they have experienced, and their level of satisfaction with campus facilities and services for international students. They rated their level of satisfaction on a 5-point scale. Descriptive analysis was done using SPSS version 25.

## **Results**

Based on the results, 53.4% of students received financial support for their education through assistantships while 10% got theirs through fellowships. 3.3% got a full scholarship while 10% were family funded. The remaining 23.3% were financially supported through a combination of different funding sources. Students stated reasons why they were seeking opportunities. These include getting a better education outside their home country (25.3%), having an opportunity to improve their career prospects in their home country (15.4%), improving their language skills (15.4%), having opportunity to gain work experience outside their home country (15.4%), opportunity to experience living in a foreign country (18.7%), financial aid provided by government and/or employer (3.3%) and pathways to immigration in the future (6.6%). Although students were seeking opportunities, there were some challenges experiences and these are as follows: issues related to my visa/ inadequate knowledge about visa regulations (5.6%), cost of living (19.1%), cost of tuition fees (14.6%), proficiency in English (9%), meeting academic demands (13.5%), difficulty in adapting to U.S. culture (6.7%), difficulty in developing social connections (15.7%), loneliness/homesickness (12.4%) and discrimination (3.4%). The students' stated that they were somewhat satisfied with campus facilities and services (grand mean of 3.79).

## **Conclusions**

Based on the results, it was shown that while some students were able to embrace the opportunities given to them, they also experienced major challenges such as cost of living, difficulty in developing social connections and cost of tuition fees. It was determined that more assistance should be provided assist international students in some areas to help them transition smoothly into the [City] University system.

## **Implications/Recommendations**

The challenges these international students face in adjusting in higher education may impact on students' academic and psychological well-being. It is recommended that faculty encourage support staff to explore available resources on behalf of incoming international students prior to their arrival to be prepared with specific resources when questions inevitably arise.

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**Exploring International Graduate Students' Knowledge Levels and Interest in State-of-the-Art Research Tools and Collaboration**

**Millicent A. Oyugi**

University of Georgia  
145B Four Towers Building  
Athens, GA 30602, USA  
Millicent.Oyugi@uga.edu

**Mathew Baker**

Texas A & M University

**Agnes O. Oywaya**

Egerton University, Kenya

**Kristin E. Gibson**

University of Georgia

**Alexa J. Lamm**

University of Georgia

**Keywords:** Africa graduate studies, research knowledge, writing, psychophysiology, collaboration



## **Introduction**

Empirical evidence suggests that students' characteristics, advisor roles, financial resources, family involvement, departmental characteristics, and research-related barriers impact doctoral and master's degree completion in developed countries (e.g., Ho et al., 2010). These issues also determine graduation rates in Sub-Saharan Africa (Almoustapha & Uddin, 2017). Many students fail to complete their graduate studies on time due to a lack of research and technical writing skills (Elmes, 2016; Singh, 2014). Meanwhile, graduate advisors overestimate their students' ability to conduct research, write reviews, and submit papers following the coursework phase (Seagram et al., 1998). Consequently, students end up ill-equipped and unable to deal with the rigors of graduate-level research (Harris, 2011). However, students' confidence in writing and completing their theses can increase through proper academic support, a dedicated workspace, and participation in graduate conferences (Bolli et al., 2015). Easy access to resources and a supportive environment for thesis writing may also accelerate degree completion (Ho et al., 2010). Studying students' research abilities contributes to identifying issues limiting or accelerating graduate studies (Abedi & Benkin, 1987). Most research has focused on undergraduate issues (De-Valero, 2001; Sverdluk et al., 2018), yet numerous unexplored factors could affect graduate students' academic efficacy. Tinto (1993), for instance, purports that doctoral students go through transitional, candidacy, and dissertation phases, each of which presents unique challenges.

## **Purpose**

The purpose of this study was to determine the level of research knowledge and interest among graduate students in agricultural education departments from selected African universities. Four research objectives were addressed in this study:

1. Describe the knowledge levels of international graduate students in various research methods and statistical content areas.
2. Describe the technical writing abilities of international graduate students.
3. Describe the level of interest among international graduate students in cutting-edge research tools.
4. Describe the interest of international graduate students in collaborating on research.

## **Methods**

Data collection progressed online through Qualtrics from a census of 65 agricultural education master's and doctoral students at five African universities: Uganda, Kenya, Tanzania, and Ethiopia. The study utilized a cross-sectional descriptive survey to collect data and address the research objectives (Fraenkel et al., 2015; Johnson, 2001). The variables included eight ratio levels of research knowledge (1 = below average to 5 = above average); four nominal levels of scientific/technical writing skills (1 = poor, 2 = below average, 3 = average, 4 = good, 5 = excellent); and interest in five psychophysiology and other real-time measurement tools (1 = no, 2 = yes). The researcher utilized descriptive statistics to analyze graduate students' research knowledge, and frequencies for their technical writing ability and interest in real-time measurement tools and collaboration in online modules and universities worldwide.

## Results

Respondents ( $N = 65$ ) perceived themselves of average knowledge levels for sampling and population ( $M = 3.68$ ,  $SD = 0.76$ ), research objective formulation ( $M = 3.64$ ,  $SD = 0.70$ ) and result and discussion ( $M = 3.6$ ,  $SD = 30.93$ ), slightly higher than other research content areas. The following categories were also rated: research problem formulation ( $M = 3.56$ ,  $SD = 0.74$ ); instrument design ( $M = 3.41$ ,  $SD = 0.71$ ); data analysis ( $M = 3.36$ ,  $SD = 0.92$ ); literature review ( $M = 3.45$ ,  $SD = 0.72$ ); and dissemination of findings ( $M = 2.92$ ,  $SD = 1.11$ ). Dissemination of findings received the lowest score on the measurement scale used in this study, implying that it was below average.

A sizable proportion of respondents rated their technical or scientific writing abilities as average ( $n = 26$ , 41%) or below average ( $n = 12$ , 19%). A sizable proportion ( $n = 20$ , 31%) considered their writing abilities to be average, while very few ( $n = 6$ , 9.38%) considered themselves excellent.

The majority of respondents expressed a strong interest in learning about psychophysiology and real-time measurement tools, such as dial testing (81%), web analytics (79%), eye tracking (85%), fMRI (76%), and psychophysiology (80%).

Most respondents reported they would use online research modules and collaborate with universities worldwide if given the opportunity. For example, students were interested in online video tutorials on research (84%), connecting with the agricultural education and extension community of practice (89%), and benefiting from seeing other students present research in their fields of study (77%).

Graduate students self-reported insufficient knowledge of research methods and statistical topics and willingness to connect with universities worldwide via collaborations, online modules, and research-related activities such as conferences.

## Implications and recommendations

Descriptive statistics revealed that graduate students at the selected universities perceived themselves of average to below-average knowledge in most research methods and statistical content areas. The perceived knowledge about disseminating research findings was below average across all research knowledge variables, implying a lack of knowledge about how or where to disseminate research findings. Likewise, their technical writing abilities varied from average to above average. Students' ability to engage effectively in the research stages of their respective graduate programs may suffer due lack of complete knowledge of critical research and statistical content areas, which may obstruct their completion time and rate of completion (Elmes, 2016). The findings suggest an opportunity to address graduate research training needs through enhanced programs, increased exposure to available capacity-building opportunities, and increased collaboration with universities and agricultural education/extension communities of practice worldwide. Conferences such as AIAEE are possible opportunities for workshops for student training, but availing an online version may benefit students who cannot attend in person. Networking events where students can partner with students or faculty from different universities

to conduct research will facilitate knowledge transfer and mutual benefits. In addition, future studies may benefit from determining if there is a gap in perceived knowledge and actual knowledge so that training opportunities can effectively address student needs.

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**Moving Toward a Social Impact Assessment: The CD+SI Toolkit™**

Dr. Abigail Borron  
University of Georgia  
405 College Station Road  
Athens, GA 30602  
[aborron@uga.edu](mailto:aborron@uga.edu)

Dr. Kevan Lamm  
University of Georgia

Dr. Keith Atkins  
University of Georgia

Mr. Joseph Barbaree  
University of Georgia

*Keywords:* community development, program evaluation, cooperative extension, community capitals framework, personal agency

# Moving Toward a Social Impact Assessment: The CD+SI Toolkit™

## Introduction

Cooperative Extension reaches urban, suburban, and rural populations with a suite of community-based programs both domestically and internationally. While significant and ongoing effort has considered, designed, and implemented enduring program evaluation methods (Borron et al., 2019; Nichols et al., 2015; Rennekamp & Engle, 2008; Rockwell & Bennet, 2004), there is still a significant need to move beyond a “one-size-fits all” approach to evaluation, which is ill-suited to accurately capture the needs of multitudes of unique communities reached by Extension (Roucan-Kane, 2008).

Impact evaluation often remains opaque and inconsistent across institutions because community-specific social impacts, which include subjective concepts such as *personal agency* and *solidarity*, are difficult to measure (Fey et al, 2006; Laverack & Wallerstein, 2001). A robust evaluation framework for Extension and international development should seek to measure both traditional development outcomes, such as economic growth (Lamm et al., 2020) and social impacts. Such an approach would utilize community members’ perceptions of their community and their own personal agency to understand the social implications of development efforts. By combining traditional impact indices with community perceptions, a comprehensive set of diagnostics can better inform the development and evaluation of community programs, challenge institutional assumptions, and shape future strategic planning (Borron et al., 2021). The work of international Extension systems and non-governmental organizations can likewise benefit from understanding stakeholder perceptions to ensure that outside development efforts begin within communities, particularly as national and community needs differ so greatly (Jayaratne et al., 2017; Warner & Murphrey, 2015).

## Purpose & Objectives

To address the need of a robust evaluation framework, the researchers previously designed a community diagnostics model based on the Community Capitals Framework (CCF) and the culture-centered approach (Borron et al., 2019). The resulting model, called the Community Diagnostics & Social Impact (CD+SI) Toolkit™, utilizes two scales that measure community assets and deficits based on individuals’ perceptions of: 1) their community; and 2) their own personal agency. Through previous validation of both scales (Borron et al., 2021; Lamm et al., 2021), this presentation represents a pilot study that combined the two scales analyzing data collected statewide in Georgia. The following research question guided this study: Can the two dimensions represented in the CD+SI Toolkit™ categorize communities based on individuals’ perceptions of their community and personal agency within their community?

## Methods

The CD+SI instrument was administered among the general population of Georgia using non-probability opt-in sampling techniques (Lamm & Lamm, 2019) to elicit residents’ responses. The collected data represented 150 of the 159 counties in Georgia. The instrument included both community perception (CP) and personal agency (PA) scales which captured individual observations of six community capitals (social, cultural, human, political, natural, and built-financial) and the perceived prevalence of each of the capitals within communities. For the purposes of the study, data were grouped and analyzed with county of residence as the proxy for community. The resulting community “scores” were analyzed to ascertain whether individual

communities exhibited high or low levels of overall capital based on the CP and PA measures. The scores indicated the extent to which a community's perceived capital was predominately based on positive or negative views of the community or observations related to individual agency.

The overall capital rating assigned to each community was derived by initially establishing an index score based on the mean value for the CP and PA scales for each survey participant. Next, index scores for the community were calculated by taking the average of all the individual index scores within the community. Lastly, the CP and PA z-scores for each community were calculated and plotted on a two-way scatterplot, resulting in a single community data point located within a matrix quadrant. CP was represented on the horizontal axis, while PA was represented on the vertical axis. The resulting matrix provided a visual representation of communities in Georgia and a heuristic representation of high, low, and mixed levels of community capital based on an aggregate CP and PA observations.

### **Results**

The results, based on the two calculated z-scores CP and PA, were placed in a two-way scatterplot. A moderately strong, positive linear association was observable when data were plotted. In addition to the visually observed positive linear association, the majority of represented counties fell into two categories: Low CP / Low PA and High CP / High PA. Fewer counties were represented in the Low CP / High PA or High CP / Low PA categories.

### **Conclusions & Implications**

This study focused on the categorical representation of counties based on individuals' perceptions of their community and personal agency within their community using calculated z-scores. The resulting scatterplot demonstrates a moderately strong, positive linear association, which potentially indicates that if CP is low, there is a strong likelihood that PA will also be low. However, with the counties that either fell into the high-low or low-high categories there is a potential opportunity to further analyze the six capitals represented in each scale and examine the unique assets and deficits that exist in each of these counties. Such characteristics may help identify unique entry points for discussion, issue prioritization, and program development that may otherwise go unnoticed in traditional community development efforts (Roucan-Kane, 2008).

In addition to individuals' perceptions, which play a significant role in community diagnostics, the CD+SI Toolkit™ represents a viable approach to community development efforts. Combining CD+SI data with metrics, such as economic and/or health indices, may have the potential to result in a more robust lens through which program design, delivery, and evaluation can take place.

From a longitudinal perspective, such a comparative analysis may reflect other nascent trends based on community-driven efforts, external stakeholder interventions, and/or collaborative efforts both internally and externally. The proposed approach and tool may provide a more definitive approach to social impact analysis and long-term evaluation.

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The rate of adoption and factors influencing Farmers' adoption of hermetic storage technology in  
Dormaa, Ghana

Namah Taku-Forchu, Iowa State University  
227 Curtiss Hall  
Ames, IA 50011  
Email: [namah@iastate.edu](mailto:namah@iastate.edu)

Misty D. Lambert, North Carolina State University  
Michael S. Retallick, Iowa State University  
Jonathan D. Ulmer, Kansas State University  
George P. Opit, Oklahoma State University

**KEYWORDS:** Post-harvest loss, hermetic storage technology, adoption, maize storage, Ghana

## **Introduction and theoretical framework**

Maize is a major staple food in Ghana and dominates food security considerations (Darfour & Rosentrater, 2016), accounting for over 50% of the country's total cereal production (Awunyo-Vitor et al., 2016). With the growing development of the poultry and livestock sector, and maize as a major component of poultry and livestock feed, it is crucial to enhance maize production (Awunyo-Vitor et al., 2016). Unfortunately, much of the maize produced does not leave the farm and get to the plate. In Ghana, for instance, a significant amount (5-70%) of maize is lost during post-harvest processes (Darfour & Rosentrater, 2016) with about 30-40% loss at the storage level (Opit et al., 2014). Researchers attribute the storage loss to the traditional methods used by farmers to store maize (Darfour & Rosentrater, 2016; Gitonga et al., 2013; Manu et al., 2019). These methods expose the maize to insect and rodent damage, pest infestations, and mold contamination detrimental to human health (Danso et al., 2018; Manu et al., 2019). This causes both quantitative and qualitative losses (Baoua et al., 2014) leading to a decrease in farm income and food insecurity (Manu et al., 2019; Sheahan & Barrett, 2017).

One possible storage innovation to increase the post-harvest life of maize is hermetic storage bags. Hermetic storage bags create an atmosphere which controls moisture and insects through reduced gas exchange. Studies reveal that using hermetic storage technology reduces grain post-harvest loss to about 1-2% (Kumar & Kalita, 2017). The adoption and use of hermetic storage bags by farmers would increase maize availability. However, we do not know the number of smallholders maize farmers' rate of adoption of hermetic storage technology in the Dormaa Municipality. Illuminating the potential factors influencing the adoption of hermetic storage technology is critical to increase adoption.

This study is guided by Roger's Diffusion of Innovation Theory (2003) to identify the rate of adoption of the hermetic storage bags. The diffusion of innovation theory guided a determination of maize farmers' current stage in the hermetic storage bag decision process. Studies have added the sixth stage indicating *no knowledge*, implemented initially by Li (2004). When potential adopters of new technology with no knowledge are identified, there is an opportunity for training and knowledge to be disseminated.

Previous studies have classified factors influencing adoption into several categories. Mignouna et al. (2011) classified them into household-specific, farm-specific, technological, and institutional factors while Mwangi and Kariuki (2015) categorized them into economic, institutional, technological, and household-specific factors. For this study, socio-economic and institutional factors are the categories used. Understanding the factors influencing the adoption of an agriculture innovation is important to guide stakeholders and policymakers.

### **Purpose and Objectives**

This study is undertaken to identify the rate of adoption and factors influencing the adoption of hermetic storage bags technology and analyze the number of bags used by smallholder farmers. Specifically, we sought to:

1. Ascertain farmers demographic characteristics.
2. Ascertain the rate of adoption of hermetic storage bags by maize farmers.
3. Determine the socio-economic factors influencing farmers' adoption of hermetic storage bags.

4. Determine the institutional variables that influence farmers' adoption decisions.

### **Methods**

The study was carried out in Dormaa, in the Bono Region, Ghana. The multistage sampling technique was used. Dormaa was selected because it is a major maize-producing area in the Middle Belt of Ghana (Opit et al., 2014). Four communities where maize production is their main economic activity were selected with two hundred and seventeen maize farmers randomly drawn across all four communities. Both open and closed-ended questions were used to assess the rate of adoption of hermetic storage bags, how farmers have stored their maize in the last two years, farmers' demographic, economic and institutional factors influencing the adoption of hermetic storage bags. The Probit model and Ordinary Least Square (OLS) estimation technique were used to analyze the probability of adoption and intensity of use of the hermetic storage bags respectively.

### **Findings**

The descriptive results show that about 58% of the farmers have adopted the hermetic storage bags, while about 42% are yet to adopt the bags. On average, there are more male farmers (0.58) than female maize farmers (0.42) in the study area. The average age of a farmer was approximately 44 years. Majority of the farmers had primary (0.29) and junior secondary (0.29) level of education, with a limited number of farmers with university/tertiary (0.05) level of education. Majority of the farmers are married (73%) and personally owned their farmland (54%) with an average farm size of 2.59 hectares.

In terms of the rate of adoption using Rogers's (2003) innovation-decision process, the results reveal that 47% of the farmers are at the confirmation stage, while 17.05% of farmers indicated they had no knowledge about hermetic storage bags. Also, results show that 94.96% of farmers who attended hermetic storage technology training adopted the bags. Based on membership in farming associations, the results reveal that 68.33% of farmers who are members of associations adopted the hermetic storage bags.

Based on the Probit model and the Ordinary Least Square (OLS) estimation technique used to estimate both the probability of adoption and intensity of use of the hermetic storage bags respectively, the results showed, training (0.86), membership in farmers' association (0.33), duration of storage (0.25), age (0.01), and marital status (0.28) had a positive and statistically significant influence on farmers' likelihood to adopt hermetic storage bags. While the educational level of the farmer (-0.57) and if the farmer was served by an extension agent (-0.276) had a negative but statistically significant influence on farmers' likelihood to adopt the hermetic storage bags. In terms of intensity or number of hermetic storage bags used by farmers to store their maize, the results showed that farm size (0.26), duration of maize storage (0.27), and quantity of maize farmers sold each season (0.18) had a positive and significant influence on the number of hermetic bags used by farmers to store maize in Dormaa.

### **Recommendations and Implications**

Results of the study will assist the Ghana Ministry of Food and Agriculture (MoFA), extension specialists and Non-Governmental Organizations (NGOs) in identifying factors that can contribute to increasing the adoption of hermetic storage bags. Given the significant role of

training, extension professionals should organize training programs to disseminate information to farmers to educate them on the benefits and use of the hermetic storage bags. This also suggests that policy interventions should target more training programs and encourage farmers of the importance and benefits of belonging to farmer's groups. It is recommended that the formation of farmers' associations in the communities should be encouraged given the high extension/farmer ratio. To increase the duration of storage, it is recommended that the governments and Non-Governmental Associations (NGOs) target and build storage facilities and equip it with hermetic storage bags for farmers to store maize and pay a token for maintenance and cleaning of the facility.

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**Utilizing a Community Capitals Framework to Evaluate a Community-Based Intervention:  
Application of the CD+SI Toolkit**

[Oral Presentation Submission]

Catherine E. Sanders  
University of Georgia  
[catherine.dobbins@uga.edu](mailto:catherine.dobbins@uga.edu)  
450 College Station Rd., Four Towers 145B  
Athens, GA, 30602, USA

Nekeisha L. Randall  
University of Georgia

Alexa J. Lamm  
University of Georgia

Kevan W. Lamm  
University of Georgia

**Keywords:** assessment and evaluation; community-based interventions; community capitals framework; rural development

## Introduction & Theoretical Framework

Community-based change initiatives based on a paradigm of shared knowledge often present a holistic foundation for localized rural transformation (Bailey, 2014). Extension agents internationally are uniquely positioned to help identify the needs of local communities in which they work to develop resources addressing issues facing communities (Lunner Kolstrup et al., 2013) while sustaining focus on the specificity of the local context (Fitch et al., 2013; Wilson et al., 2019). The current study is a case example of an Extension-based partnership created to broaden community-level capacity (Bailey, 2014) through efforts focused on obesity prevention. The Healthier Together “Lambert” (HTL) program aimed to increase healthy food availability and consumption and physical activity opportunities in a county where obesity affects more than 40% of the local population.

The study was guided by the Community Capitals Framework (CCF; Flora et al., 2004), an analytical tool for evaluating information related to community resources, or capitals (Emery & Flora, 2006). A capital is “any type of resource capable of producing additional resources” (Flora et al., 2004, p. 165). Capitals can be influenced when a community begins focusing on change (Emery et al., 2006) and include social, cultural, political, human, natural, and built-financial components (Borron et al., 2019). The Community Diagnostics and Social Impact (CD+SI) Toolkit was created to capture systematic measurements of social impact through the CCF (Flora et al., 2004). The CD+SI Toolkit provides a baseline assessment of the community’s capitals, providing a framework for analyzing longitudinal data to capture change over time (Borron et al., 2019). Building upon an identified gap in literature providing international extension educators with tools for assessing community capitals (Borron et al., 2020), the current study demonstrates a case application of the CD+SI Toolkit within a rural health development context.

## Methods

The purpose of the mixed-methods study was to describe the community capitals present in “Lambert” County, Georgia through the CD+SI and CCF framework to determine the extent to which HTL influenced capital development. The following research questions guided this study: 1) What community capitals are present in the community?; 2) What relationship is there between the level of a specific capital and the way community members talk about the capital?; and 3) What gaps remain between descriptions of social capitals by community members, results of the CD+SI, and holistic descriptions of the community?

The case study approach influenced the research design to establish nuanced descriptions of a community to offer insight to a particular issue (Crowe et al., 2011; Lovell et al., 2018). The authors aimed to explore how the HTL community coalitions affected community capitals within “Lambert” County by identifying the capitals present before and during the implementation of the project. To accomplish this, a mixed-method approach was used, using semi-structured interviews and a survey.

Interview data were analyzed deductively using *a priori* codes from the CCF. The quantitative portion used identical sampling procedures to triangulate the qualitative portion of the study (DeCuir-Gunby & Schutz, 2017). Following the interviews, participants completed the survey online via Qualtrics. The survey instrument was developed by Lamm et al. (2020), a CD+SI scale specifically focused on community agency. Items in the scale were measured on a five-point Likert-type scale ranging from 1 – *strongly disagree* to 5 – *strongly agree*. Out of 27

coalition members contacted, 12 agreed to participate in the study. Descriptive statistics were used to calculate the frequency and percentages of the six capitals. Data integration for both qualitative and quantitative approaches were merged by comparing the results of the interviews and surveys to determine convergence and divergence (DeCuir-Gunby & Schutz, 2017).

### **Results**

Participants rated social capital highest ( $M = 3.63$ ,  $SD = 0.66$ ), described through concepts such as neighborliness, new community collaborations, and pride in community. Political capitals ( $M = 3.44$ ,  $SD = 0.71$ ) included concepts such as interaction between community members and elected leaders, the impact of COVID-19 on coalition momentum, and the importance of grassroots change. Built-financial capitals ( $M = 3.08$ ,  $SD = 0.57$ ) included the absence of industry and economic downturn experienced by the community. Natural capital ( $M = 2.95$ ,  $SD = 0.72$ ) was discussed in the context of recent natural disasters, local resources, and enhancements made by the HTL project. Cultural capitals ( $M = 2.80$ ,  $SD = 0.72$ ) included community religious and agricultural identities as well as historical racial issues. Human capitals were rated lowest ( $M = 2.48$ ,  $SD = 0.71$ ) and were framed through prevalent health issues and lack of access to health care; however, participants described how HTL increased access to healthy food and opportunities for physical activity.

### **Implications and Recommendations**

If the goal of community development is to produce lasting enhancements with positive impacts, such efforts cannot be accomplished solely by external interventions. For holistic local transformation, those external to a community must work with those most affected by change efforts through grassroots approaches, which can be more effective for community development efforts as they give community members the opportunity to increase their capacity for change (Bailey, 2014; Christens & Inzeo, 2015). The CD+SI Toolkit leverages extant community resources to increase community-driven change within international development initiatives.

This study enhanced application literature related to the CD+SI, an inherently mixed-method instrument (Borron et al., 2019). The CD+SI mixed-method approach provides the potential for researchers to identify potential entry points for community-based initiatives. A recommendation would be to use the approach to identify deficits within relevant community capitals and relate them to local context to determine the most culturally, socially, economically, and politically efficient path for development. As rural change efforts are recognized as a way to foster inclusivity within and across global communities (Olmedo et al., 2021), the CD+SI Toolkit allows for an analysis of the interrelated nature of findings across locational, material, and identity aspects of place (Belanche et al., 2021), an important concept for rural international agricultural development. The current case application demonstrates how the CD+SI Toolkit can inform future international community-based extension efforts by leveraging resources identified through a baseline assessment of community capitals.

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**Impact Evaluation for Evidence-Based Decision Making through Engaged Scholarship in  
Food, Agriculture, Natural Resources and Related Sciences**

Kim E. Dooley, Texas A&M University  
Agricultural Leadership, Education, and Communications  
240 Agricultural and Life Sciences Bldg.  
College Station, TX 77843-2116

Robert Strong, Texas A&M University

Theresa Pesl Murphrey, Texas A&M University

Jennifer Strong, Texas A&M University

Chanda Elbert, Texas A&M University

Mathew Baker, Texas A&M University

Keywords: Evaluation, Value, Active Learning, Leadership, Theory

Consideration for research oral presentation

# **Impact Evaluation for Evidence-Based Decision Making through Engaged Scholarship in Food, Agriculture, Natural Resources and Related Sciences**

## **Introduction**

For the last half century, social and behavioral scientists have argued that their disciplines should engage in research that contributes to complex societal problems (Western, 2019). How do we join forces with biophysical scientists to contribute important evidence-based solutions for policymakers, practitioners, researchers, and other stakeholders within communities? This theoretical presentation is in the early phase of field-testing pathways, processes, and intervening variables that form causal mechanisms to measure innovation and change. Causal mechanisms include the choices and capacities which lead to regular patterns of social behavior that are usually hidden and sensitive to variation in context (Pawson & Tilley, 1997; Astbury & Leeuw, 2010). There is a need to look more deeply into the generative causation of successful programs to enable evaluators to make more credible statements on causal links between the contribution of an intervention and the observed effects (Schmitt, 2020). “For the evaluation to generate useful and reliable evidence, stakeholders should invest sufficient time to clarify conceptual issues and engage in knowledge transfer about the strengths and weaknesses of approaches in an early stage of the evaluation process” (Schmitt, 2020, p. 23). For example, if decisions that affect one part of the food system causes unexpected consequences that could impact the environment, human health and food accessibility, research related to innovation and change can inform ethical responsibility and crisis communication using a systems research design. Engaging with a variety of stakeholders promotes sharing of data, equitable participation, and public-private partnerships for collaboration.

## **Purpose and Objectives**

The purpose of this paper is to introduce the EVAL framework (Roberts et al., 2021) as a theory-driven impact evaluation tool that can be operationalized for translational science. The objectives are to: (a) increase skills to promote evaluation within organizations, (b) increase engagement of users and beneficiaries in evaluation processes, and (c) increase collaboration of social and behavioral scientists in evidenced-based decisions.

## **Theoretical/Philosophical Themes**

There are four constructs of the EVAL Framework that will be presented as the model: **E**valuation, **V**alue, **A**ctive, and **L**eadership (Roberts et al., 2021). This framework allows stakeholders to “be better positioned to conduct effective evaluations of administrative programs and provide leaders access to the data necessary to make informed decisions” (USDA, 2018, p. 11). This approach promotes ethical practices for conducting evaluative research for building/maintaining community trust. Rather than the “giver” or “gatherer” of information (expert), the role is to share facilitation roles to equally value local knowledge (empowerment). Moving from expert to empowerment is manifested through interactive data collection techniques, like transect walks, group discussion, matrices for ranking needs and other active ways of engaging the community. It parallels the qualitative/action research paradigm (Guba & Lincoln, 1981) and the empowerment of local communities with learners as co-creators of

knowledge (Freire, 1970) while bridging selected spatial (e.g., social network analyses) and quantitative techniques (e.g., Bayesian Models and Q-Sorts).

Evaluations are grounded in clear and appropriate values, principles, attributes, or qualities held to be intrinsically good, desirable, important, and of general worth (Stuffelbeam, 2001). The American Evaluation Association's (AEA) *Guiding Principles* emphasize the importance of an evaluators' obligation to not only become knowledgeable about other cultures, but also have the competence to evaluate the context in which the evaluator operates. The lack of familiarity with other cultures affects the ability for an evaluator to effectively guide, conceptualize, analyze, and interpret an evaluation (Fitzpatrick et al., 2011).

This framework considers personal values and how to minimize bias in evaluations through active and experiential learning methods. Active and experiential learning involves fostering attitudes, developing, and practicing skills, and promoting understanding of concepts and models (Silberman, 2006). Concrete experience, such as farmer field schools, promotes observability of the innovation. Opportunities to reflect and critically think about what was observed and connecting knowledge to other situations promotes further adoption. These active and experiential strategies engage users and beneficiaries in evaluation processes with the use of evidence in decision-making about the attributes of an innovation.

Brungardt's (1996) model of leadership development incorporates leadership trainings and workshops (specific skills), leadership education (formalized leadership theoretical knowledge), and leadership development (active learning application and reflection). This skill development requires working in teams, ethical decision-making, and intra and interpersonal communication. The addition of leadership programs for stakeholders will enhance further adoption to promote continuance of innovations in communities.

This model can integrate different theoretical constructions, such as the innovation-decision process, attributes of an innovation (relative advantage, compatibility, complexity, trialability and observability), and local opinion leadership (Rogers, 2003). Developing local opinion leaders sustains the innovation package over time for broader impacts. Evaluation can consider demographic variables, previous experiences with agricultural technologies, development of leadership attributes related to communication channels, working in teams, using system and critical thinking, ethical decision making, cultural relevance, and overall impacts of the project objectives on changing stakeholders' abilities, attitudes, and aspirations.

## **Results/Products**

The model is currently being field tested with research partners facilitating community needs assessments/evaluation for community engagement and teaching evaluation. Data is being collected using focus groups, participatory rural appraisal (PRA), observational field notes, surveys, and documents/photographs (Blundo-Canto, 2020; [author, 2018]; [author, 2007]). Multiple data sources and varying perspectives can be used in analyzing the data based upon the theoretical framework (i.e., Rogers, 2003). "This comparison of the data generates theoretical properties of the category...Thus the process of constant comparison stimulates thought that leads to both descriptive and explanatory categories" (Lincoln & Guba, 1985, p. 341). We will draw



upon the principles of contribution analysis (Mayne, 2012) and participatory impact pathway analysis (Douthwaite et al., 2007) for a participatory construction and validation of the impact pathway.

### **Recommendations/Educational Importance/Application**

To refine and test the EVAL framework in various contexts, respondents will be purposively selected based upon characteristics/criteria established by the research team drawn from beneficiaries worldwide. The expected outcomes include the testing of this framework for evaluating complex projects, incorporating values and opinion leadership, and promoting project sustainability and impact for evidenced-based decision making through engaged scholarship.

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## **Factoring Food Security: A Q Methodology Study with Ghanaian Educators**

Jessica R. Spence

The Norman Borlaug Institute for International Agriculture and Development  
AGSV Building, Suite 201, Office 215  
578 John Kimbrough Blvd.  
College Station, TX 77845, United States  
jessicarae2@tamu.edu

Carson Letot

The Pennsylvania State University  
Global Teach Ag Network  
1971 Shortlidge Rd,  
State College, PA 16803  
ctl84@psu.edu

Tobin Redwine

Vivayic Inc. and Texas A&M University

Key Words: Food Insecurity, Agriculture Education, Ghana, Teachers, Q Methodology

## **Introduction and Literature Review**

Food insecurity is identified as ‘limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire food in socially acceptable ways’ (Hamilton et al., 1997: 50). According to the United Nations’ Food and Agriculture Organization, 27.4% of the population of Africa is severely food insecure, a number that has risen by 3% between 2014 and 2016 (FAO). Food insecurity in Ghana remains to be an urgent human development challenge (Mohammed, 2021).

Osei (2006) concluded that for Ghana’s economy to move forward and prosper, education reform needs to occur. Holistic education reform of any kind involves understanding relevant issues and educator beliefs towards those issues (Newcomb et al. 2004). Student motivation can be leveraged through authenticity of those beliefs (Mendes, 2003; Schraw & Olafson, 2015). Therefore, the study team assessed teachers’ perspectives on food insecurity issues to better understand the population that is directly engaged with the Ghanaian youth who have the potential to improve the economic and food insecurity status of the country.

## **Purpose and Objectives**

The purpose of the study was to explain Ghanaian teacher’s viewpoints in global food security issues by understanding their priorities via Q methodology. The research objectives included determining personas of Ghanaian teachers’ viewpoints on food security issues.

## **Methods**

We used Q-method design to (Watts & Stenner, 2012) characterize educator priorities within food security. Q-method uses operant subjectivity to characterize viewpoints, perceptions, and opinions developed from individuals’ personal experiences (Brown, 1996; Leggette & Redwine, 2016). Therefore, Q.method is an appropriate tool to characterize experiences and perceptions shaping teachers’ views about food security issues in Ghana.

The concourse for this study was derived from Spence, et al. (2021) Q-method study on American teacher’s viewpoints on food insecurity. The concourse is a set of ideas that are sorted on the Q-sort board. The Q-set is a subset of the concourse and consists of statements that are sorted by the participants (Watts & Stenner, 2012). Statements are identified by condensing material from the concourse. This resulted in 36 items represented as the Q-Set related to the intersection of global learning, food security, and education (Watts & Stenner, 2012; Spence, et al., 2021).

The P-set are participants in a Q-method study (Watts & Stenner, 2012). We used a convenience sample to select Ghanaian teachers involved with 4H Ghana. The participants consisted of college degree holding Ghanaian teachers (n=31; 18 male and 13 female) ranging in age from 22 to 45. They teach from primary-secondary students, and one or more subjects including: English, Ghanaian Language, science, mathematics, and arts.

In a Q-study, the primary form of data collection is the Q-sort, in which participants (the P set) sort items (the Q-set) to articulate their preferences within the p set (Leggette & Redwine, 2016). Participants sort least important most important on a form board (Leggette & Redwine, 2016). The data is then analyzed using PQ software to determine emerging, statistically significant factor groups that determine personas defining groups of thought amongst the participants.

## **Results and Conclusions**

This study resulted in four factor groups that explain 50% of the variance of the total population of the study.

***Persona One: Quality Over Quantity***

The Quantity Over Quality factor group explained 17% of the variance and had a .97 composite reliability, making it the group with the largest number of defining sorts. This group indicated “Access to nutritious food” and “More hygienic household and community environments” as the most important statements and “Zero loss of waste of food” and “Identifying the determinants of waste” as the least important. The Quality Over Quantity was comprised of five males and five females and came from a diverse set of topic areas.

***Persona Two: Waste Not***

The *Waste Not* factor group explained 9% of the variance and had a .88 composite reliability. This group indicated “Zero loss of waste of food” and “Understanding and addressing stakeholder incentives, constraints, capacity, and preferences” as the most important statements and “Implementing sound agriculture water management technologies” and “Education of populations about global food security” as the least important. This group is defined by two individuals, both male, math and science teachers.

***Persona Three: Sustainable Sisters***

The Sustainable Sisters explained 14% of the variance and had a .92 composite reliability. This group indicated “Improved nutrition and dietary quality” and “Food systems being sustainable” as the most important statements and “Restoration of degraded farm lands” and “Relationships between policy systems and food security” as the least important. This group is defined by three individuals—both female English teachers, 31 and 30 years old, from differing schools.

***Persona Four: Futurists***

The *Futurists* explained 10% of the variance and had a .92 composite reliability. This group indicated “Promoting natural resource conservation” and “Investing in sustained, long-term research (towards food security innovations)” as the most important statements and “Adding post-harvest value to agricultural products” and “Ending rural Poverty” as the least important. This group is defined by three individual sorts: All male, math and economics teachers from differing schools.

**Recommendations**

Ghanaian educators prioritized global food security issues through four perspectives: *Quality Over Quantity*, *Waste Not*, *Sustainable Sisters*, and *Futurists*. Stakeholders should use this awareness of perspectives to enhance training and professional development offerings in global education that align with these perspectives. Ghanaian educators should be aware of their perspectives and tailor instructional methods accordingly to address potential gaps in education strategies, thereby equipping students to make an impact on Ghana’s food insecurity issues. In addition to personal awareness, groups like The International Agricultural Education Fellowship Program should curate specific professional development opportunities to compliment those perspectives. We recommend further investigation into other educator groups that also play a role in youth engagement in food security. We recommend qualitative studies focused on collecting contextualized and rich data on both challenges unique to specific regions and successful

strategies being implemented currently to help frame future work with youth. Finally, we recommend following up with participating Ghanaian educators to understand how enhanced awareness supports their teaching strategies, and scales up application to other educators.

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# **Comparing and Contrasting Agricultural Extension Services Around the World: An Analysis**

Rama Radhakrishna  
Professor and Assistant Dean for Graduate Education  
College of Agricultural Sciences, 217 Ag Administration Building  
The Pennsylvania State University  
University Park, PA 16802  
[brr100@psu.edu](mailto:brr100@psu.edu)

Mallen L. Marlowe  
Graduate Research Assistant  
Department of Agricultural Economics, Sociology, and Education  
The Pennsylvania State University  
University Park, Pennsylvania

Alejandro Gil  
Carson Letot  
Carolyn Henzi  
Emma Wallace  
Tyler McFeaters  
Graduate Research Assistants  
The Pennsylvania State University

**Keywords:** Extension Systems, Program Development, Curriculum, Linkage, Evaluation

# **Comparing and Contrasting Agricultural Extension Services Around the World: An Analysis**

## **Introduction**

Agricultural Extension Services were established to provide educational information to farmers and others on agriculture and related activities. However, the dissemination and use of improved agricultural technology and management practices is not a new concept, its origins can be traced back thousands of years in different parts of the world, including China, Mesopotamia, Egypt, and even in the Americas (Swanson & Rajalahti, 2010). As noted by Mukembo and Edwards (2015) “according to True (1929), toward the end of the 18th century, several agricultural schools were established in different parts of Europe to promote agricultural development” (p. 51). In most countries, agricultural extension services were first established by colonial powers or were closely modeled in a way similar to that of the early United States’ extension service (Coombs & Ahmed, 1975; Hulme, 1983). Many countries also established agricultural extension services to drive their agricultural sector and contribute to the well-being of farming community and economic development. Further, the United States provides both technical and financial assistance to countries in Africa, Asia, the Middle East, and Eastern Europe who became independent from colonial rule. The curriculum on Extension in the developing world does provide a good profile of countries using various Extension systems—T&V system, Farmers Field Schools, however, they do not provide an analysis of comparing and contrasting of Extension systems around the world.

## **Purpose and Objectives**

The overall purpose of the study was to examine profiles of Extension Services of select countries across five continents and compare and contrast the profiles for similarities and differences using a LCT approach. The objectives of the study were:

- 1) Review agricultural extension services of select countries in Africa, Asia, Middle East, North & South America, and Australia
- 2) Compare and contrast Extension systems in terms of social, economic, and agricultural profile of countries selected
- 3) Describe in detail how Extension services are organized including extension program development, design, delivery, and evaluation
- 4) Compare and contrast the Extension services in selected countries with U.S. Extension

## **Methods/Data Sources**

We took an innovative approach to select countries with an emphasis on selecting at least one country from each continent. The approach we used is Learner-Centered Approach-LCT (Weimer, 2012). According to Weimer, LCT embodies five characteristics: 1) total engagement of students in the learning process, 2) acquisition of skill instruction that helps students to think, solve problems, analyze arguments, debate, 3) encouragement of students to reflect on what they

are learning, more specifically what they are learning and how they are learning the concept, 4) give control of the learning processes to students thereby increasing motivation to learn, and 5) encourages collaboration, that is, students learn from each other. In this approach students carry out the research plan and conduct the analysis. A simple guideline and criteria were developed to help synthesize the information gathered to answer the objectives. The following processes were used. Students selected a country of their choice and adhered to the course requirements in preparing the final paper and presentation which included: 1) describe the social, economic, and political factors, 2) identify the chosen country's Extension system, describe its history; discuss how Extension programs are designed, delivered and evaluated; 3) identify strengths and weaknesses and suggest opportunities to improve them, 4) compare and contrast the U.S. Extension system with the chosen country, and 5) discuss strengths and areas of improvement. Students modified these questions to meet their individual needs. Once the country was selected, students collected data through literature search, interviews with students from the countries selected, discussion with peers, guest speakers, and the instructor. The information gathered from each country were summarized based on the five processes stated above.

### **Results, Products, Conclusions**

Based on the LCT approach, students selected their country of choice: Australia/New Zealand, Brazil, Egypt, Ghana, Peru, and South Africa. Additionally, they also reviewed guest presentations on Nepal, India, and the Philippines. Upon review and synthesis of agricultural extension systems in these countries, the major findings are presented below:

Most countries organized their extension systems prior to the 1960s with some support from the United States.

A majority of the countries with the exception of Australia/New Zealand has a top-down approach to extension, where the planning and resource allocation is done at the national level. However, some decentralization and presence of private extension were found in Nepal and the Philippines.

Diversity of Extension programs in the selected countries were evident which ranged from totally agriculture to other diversified initiatives with an emphasis on small-scale farmers and limited resource families.

Linkage between research and extension was found to be very weak in countries like Egypt, Nepal, Ghana, and South Africa. However, the linkages show improvement in Nepal, India, and the Philippines. Both Australia and New Zealand had good linkages because of specific production areas such as sheep, dairy, and others.

Monitoring and evaluation of programs is evident, but not exploited to the full extent to document impact.

Education level of Extension workforce in most countries was below bachelor's level. For example, there were very few Extension workers including specialists with a doctoral degree. Egypt had one or two specialists with a doctoral degree.

There were similarities and differences when comparing the U.S. agricultural extension systems. Similarities included program needs, the differences were in terms of program delivery, funding, university Extension vs. state involvement, impact assessment, etc.

### **Recommendations/Implications/Educational Importance**

Collectively, we found that LCT approach can be used to enhance curriculum in international agricultural development. Courses in international agriculture could use the findings from this approach to enhance understanding of agricultural extension systems around the world. The concept of engagement, collaboration, teamwork, self-reflection, and learning is evident, suggesting that the learners can be co-creators of curriculum/courses or programs. One of the outcomes from this study is a publication of a book chapter on agricultural extension for students to use at the undergraduate level. Another outcome is awareness and understanding of agricultural extension systems that are diverse, varied, top-down, and the functioning of government-led Extension.

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**Poetic Transcription for Identity Exploration: Engaging Arts-Based Analyses for  
Community-Based Program Evaluation**

[Oral Presentation]

Catherine E. Sanders  
University of Georgia  
[catherine.dobbins@uga.edu](mailto:catherine.dobbins@uga.edu)  
450 College Station Rd., Four Towers 145B  
Athens, GA, 30602, USA

Alexa J. Lamm  
University of Georgia

**Keywords:** arts-based research; evaluation; poetic transcription; sociocultural identity; social impact

# **Poetic Transcription for Identity Exploration: Engaging Arts-Based Analyses for Community-Based Program Evaluation**

## **Introduction**

As evaluation research aims to more holistically capture social impacts which affect people's physical, political, and interpersonal lives (Borron et al., 2019; Jones et al., 2017), research methodologies that analyze social impacts may act as an entry point into program evaluation in a way that promotes parity and integrity on behalf of participants (Gust & Jordan, 2006; Srinivas et al., 2015). In an effort to enhance social impact assessment through using arts-based methodologies, poetical thinking offers a potential approach which offers a "multidimensional and insightful form of social science writing to engage more diverse audiences" (Cahnmann-Taylor, 2008, p. 639).

Broadly defined, social impact refers to the effect of a program on the well-being of a specific population (Franz et al., 2014). Social impacts relate to conceptualizations of identity, both individual and collective, and culture, as social constructions are key to cultural orientations of how humans view themselves within their environment (Burdge et al., 1995). Individuals classify themselves and others into social categories which have significant effects on aspects of group behavior (Nkomo, 2010). A social impact approach to evaluation represents a transition from an external to internal frame of reference with community-engaged research to more effectively facilitate change efforts (Borron et al., 2019).

The construction of poetic transcriptions and the artful method of analysis allows for a more explicit acknowledgement of the evaluator's embeddedness with both the data and the program being evaluated. Using a specific lens of identity, the authors posit that a culturally-responsive approach to evaluation using arts-based analyses may reveal methodological and empirical insights overlooked in previous engagements with qualitative evaluation data. Combining a lens of identity within an arts-based approach should allow for a more holistic conceptualization of social impacts resulting from community-based projects.

## **Purpose & Research Questions**

The purpose of this study was to explore the use of poetic transcriptions within a community-based research context. The following research questions guided the inquiry: 1) What can poetic transcriptions illuminate about identity within a community-based project?; and 2) What methodological insights were gained as a result of using poetic transcription for evaluation?

## **Methods**

Data collection occurred as part of a 5-year evaluation plan to assess project outcomes for a rural public health intervention for obesity prevention. Data were collected through phone interviews with members of the community coalitions in each county involved with the project. Coalition members worked closely with faculty and staff from the University of Georgia for project development. For data analysis, poetic transcription (Glesne, 1997) was used to articulate the meaningfulness of themes generated through previous thematic analyses (Hill, 2005).

Engagement with poetic interpretations of participant speech is a form of qualitative work that enhances awareness of concepts like social identity, equity, and access to capital, whether

cultural, linguistic, or educational (Cahnmann-Taylor, 2008), in one's evaluation practice. The current study followed Glesne's (1997) concept of poetic transcription, or the "creation of poemlike compositions from the words of interviewees" (p. 202). To create each poem, phrases were selected which embodied a particular theme identified through previous thematic analyses (Carr, 2003; Hill, 2005). Specifically, phrases included in the poems represented areas of space to pause and reflect on the research topic of sociocultural identity – moments when the participants revealed pieces of themselves and their identity in ways they might not have consciously recognized.

### **Results and Conclusions**

The poetic transcriptions captured multifaceted aspects of identity. Thematic concepts guiding the poetic transcriptions included *religion, feelings of being an outsider, and relations between history and place*. Methodological insights from engaging with the poetic approach were varied, but primarily included looking at evaluation data in new ways which helped refocus evaluation and programmatic efforts toward diversity and equity. Reading through the transcripts through the lens of sociocultural identity allowed for an exploration of the research topic in a nuanced manner, further revealing the importance of understanding deeply the influence of place and history on a community in which a program is implemented. Without an arts-based approach, much of the individual nuance present in these moments of expressed identity would be lost through the traditional coding process, focused on the aggregation of common themes. Engaging poetically with data only previously analyzed through thematic analysis allowed for viewing the data in ways that disrupted traditional boundaries of objectivity within an evaluation setting.

### **Recommendations, Implications, and Applications**

While poetic analysis may be used primarily to evoke an emotional response from the reader, using poetic transcription together with more commonplace modes of reporting data, such as to enhance the descriptions of themes (Carr, 2003), can more deeply express the impacts and outcomes of community-based evaluation work. Evaluators traditionally claim a dispassionate stance toward their work, viewing advocacy of specific values with disdain, despite being motivated by specific cultural and personal values in their work (Patton, 2021; Stake, 2004). However, perhaps the time has come for evaluators to utilize methods that enhance communication and connection with the lived experiences of those evaluated (Rorty, 1989). Engaging with data through an arts-based approach forces researchers to see themselves within the data, explicitly situating themselves within the context rather than remaining an objective observer. Through poetic transcription, one can transform traditional qualitative data into modes of meaningful expression to communicate the lived, sociocultural experiences of others (Carr, 2003), experiences central to the work done in international agricultural development and evaluation.

Poetic analysis helps capture the complexity of the human experience within the social and cultural world (Hill, 2005). As evaluators working within international community development contexts, recognizing one's connectedness with program participants is critically important for effective and culturally-responsive modes of evaluation (Johnson et al., 2013). Arts-based evaluation methodologies can bring practitioners closer to the communities with whom they work and thus the social impacts they desire (Borron et al., 2019; Johnson et al., 2013). Novel analytic processes urge evaluators working in cross-cultural contexts to think through produced



narratives and how they may serve as an invitation for co-participation in the creation of a more humane and just world (Harter, 2009; Sharf & Vanderford, 2003).

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# **The Social Side of Soils: A Farmer Centered Analysis on the Adoption of Cover Crops**

Paige Allen  
The University of Guelph  
p.gennings.allen@gmail.com  
196 Dublin Street North, Unit A  
Guelph ON  
N1H 4P2

Dr. Ataharul Chowdury  
School of Environmental Design and Rural Development  
The University of Guelph

Keywords: cover crop, sustainable agriculture, farmer perspective, adoption process, social/cultural factor

# Abstract

## **Introduction:**

Agriculture is an essential part of our livelihoods; however, it is entirely reliant on natural resources. The agricultural sector is distinctive as it directly impacts the environmental resources it is reliant upon (Pretty, 2008). Growing food demands lead to agricultural intensification, increasing pressures on water, land, biodiversity, and soil (Arneeth et al., 2019a; Pretty & Bharucha, 2014; Garnett et al., 2013). The Intergovernmental Panel on Climate Change, a body of the United Nations stated that agricultural land degradation can be addressed through the adoption of sustainable land management practices, alongside a focus on socioeconomic and ecological factors (Arneeth et al., 2019b). Soil health is fundamental to agriculture and poor soil health has an impact on environmental quality, ability to produce food, and takes an extensive amount of time to regenerate (Arneeth et al., 2019a; Smith & Smithers, 1992; Lal, 2015). Soils that are covered by crop residue, plants, or snow are more protected from degradation/depletion compared to bare soils (Huffmand & Jiu, 2016).

Within Ontario, soil health is a topic of increasing concern, with confirmation of decreasing soil organic matter, bare soils during winter and increased risk of soil erosion (Soil Health Working Group, 2019). One means of mitigation is incorporating cover crops. (Kaye & Quemade, 2017; Kasper & Singer, 2011). When discussing sustainable practices like cover crops, it must be acknowledged that the term sustainability is complex (Dunlap et al., 1992; Maxey, 2006; Maynard & Nault, 2005). This research adopts a comprehensive definition of sustainability, acknowledging the complex connections between economic, environmental, and social factors (Cleveland, 2013; MacGregor & McRae, 2000; Stonehouse, 2004; 2017 Sustainable Farming, 2017). Nerlich and Döring (2005) state that for sustainable agriculture to be implemented effectively, we need to consider the social and cultural components, not simply the economic costs.

Adoption is a dynamic process, with farmers playing a central yet often overlooked role. Farmers are the primary actualizers of adaptations, programs, and policies; therefore, their perspectives directly influence the success of these resources (Feola et al., 2015; Home et al., 2014; Moon & Cocklin, 2011). Acknowledging farmers' actions from a socio-ecological context is necessary to identify where intervention is possible and facilitate effective change and innovation (Feola et al., 2015).

## **Purpose and Objectives:**

The first objective sought to identify the social, cultural, environmental, and political factors associated with Ontario grain farmers' decisions to adopt or not adopt cover crops. While the second objective determined which support systems and knowledge sources farmers accessed related to the process of adopting a new practice.

## **Methods:**

This research utilized a qualitative approach, conducting in-depth interviews. The scope was limited to southern Ontario grain farmers, as they represent a large portion of the farming community, with the Grain Farmers of Ontario representing roughly 28,000 farmers across the province (Grain Farmers of Ontario, n.d). Therefore, the choices these farmers make regarding agricultural practices have the potential to have a large impact on the agriculture and agri-food sector in Ontario.

Data was collected through both telephone and in-person interviews. Participants were determined based on geography, type of production and subdivided into adopters and

non-adopters of cover crops. Out of the 16 interviews conducted, 11 were with adopters and 5 were with non-adopters.

I began the analysis process by conducting a preliminary assessment of the interviews. The interviews were transcribed and analyzed using NVivo. Narrative and thematic analyses were adopted, which allowed for a data-driven inductive approach (Boyatzis, 1998; Fereday & Muir-Cochrane, 2006), and a deductive approach which utilizes a previously developed codebook (Crabtree & Miller, 1999; Fereday & Muir-Cochrane, 2006).

### **Results:**

The major results of this research can be summarized into three main sections: social factors, catalysts, and support services. In terms of social factors, farmers were asked specific questions to elicit their perspectives, beliefs, values, and attitudes related to their land, the concept of sustainability and cover crops. Overall, adopters and non-adopters shared more similarities than differences regarding their beliefs and values on the topic of cover crops. The major difference was seen in attitudes, which is the expression and action on a belief and value. In this case, despite non-adopters believing and valuing the concept of cover crops, they have chosen for various reasons to not act.

Another notable difference is related to social factors between adopters and non-adopters is interpersonal relationships and level of involvement. Adopters tended to have more extensive personal networks, were involved in a greater number of farm organizations, and took a more active role. Adopters also tended to be more involved in non-farm community-based organizations.

The social factors identified also impacted a participant's catalyst or reason for adopting or not adopting. The results show that reasons for adoption tend to be socially embedded while reasons to not adopt are a mix of personal and external factors that are not personally governable.

The final set of results is related to access and use of support services. Overall participants felt they had adequate access to resources associated with cover crops. Some challenges that emerged were a lack of agricultural representation and unequal access to resources, especially for smallholders. The decline of public extension service delivery and the emergence of a privatized service system means that smallholders need to follow the logic of economic benefits while accessing services. The findings are relevant to other provinces and states in North America which has transitioned to pluralistic systems comprising various actors in extension and advisory services.

### **Recommendations:**

Although this research is focused on southern Ontario the implications can be applied globally. The results indicate that it is necessary to find alternative ways to incentivize innovators, be that through a funding program or payment for ecosystems services. It is necessary to consider the process of incorporating social factors into the development and dissemination of agricultural policies and programs. The current policy that adopted the knowledge translation and transfer (KTT) approach needs to align and integrate KTT activities with farmers' social networks. The approach should encourage more collaboration between farmers and researchers, exploring alternative ways to engage the end-user directly.

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**Title:** Farmers' Information needs and perceptions about Livestock and Dairy Development Department in Punjab, Pakistan

**Authors:** Muhammad Saleem<sup>1</sup>, Shoukat Ali<sup>1</sup>, Aqeela Saghir<sup>1</sup>, M. Qamar Bilal<sup>1</sup>, Mark Russell<sup>2</sup>

- 1) Institute of Agricultural Extension, Education and Rural Development, University of Agriculture, Faisalabad
- 2) College of Agriculture, Purdue University

Mark Russell, ASEC, 915 West State St., 3-230 Lilly Hall, Purdue University, West Lafayette, IN 47907, [mrussell@purdue.edu](mailto:mrussell@purdue.edu)

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**Oral Presentation**

**Farmers' Information needs and perceptions about Livestock and Dairy Development Department in Punjab, Pakistan**

**Introduction and/or theoretical framework and/or review of the literature**

The livestock industry in Pakistan is important to the overall economy and farmers' information needs and perceptions about the Livestock and Dairy Development (L&DD) Department, extension services are critical to policy decisions. It is estimated that more than 8 million rural families are engaged in the livestock profession in Pakistan. Livestock sector contributes 60% to agricultural GDP and 11.5% to overall GDP of Pakistan. It plays an important role in food security and is integral to livelihoods as rural families derive 30-35% of their income from livestock. The gross value addition of this sector has increased by 3% from 1461 billion rupees in 2019-20 to 1505 billion rupees in 2020-21 (Government of Pakistan, 2021). Punjab province has 49% of the total cattle. About 65% buffaloes, 24% sheep, 37% goats, 22% camel, 47% horses, and 48% poultry of the country found in Punjab (Time of Islamabad, 2016). Meat export is an important source of foreign exchange earnings for the country. Total meat production was 4.75 million tonnes during the year 2019-20. A total of 47.9 thousand tonnes of value-added red meat was exported during 2017-18 which was valued at 204.4 million US\$ for the registered export-oriented slaughter houses in the private sector. More than 80% of all livestock are raised by an estimated 30-40 million small-scale producers with less than 6 animals per household (Bradfield and Ismail, 2012).

### **Purpose and objectives**

A L&DD Department has been part of Pakistan since the inception of the country, yet there exists a huge gap between the production and the requirement of milk and meat in the country. Livestock extension is an institutional input for the development of livestock sector. The low production of the sector raises the question about the effectiveness of the extension delivery system. Therefore, the present study analyzed the extension services rendered by the L&DD Department. The findings of the study will also be useful to review the current livestock policies. The overarching objective was to analyze Livestock Extension Services Provided by Directorate General (Extension) in District Faisalabad Punjab, Pakistan. We are addressing the specific objectives to better understand the farmers' perceptions regarding livestock services rendered by the L&DD Department and to identify the sources of livestock-related information used by the livestock farmers. This information is needed to make suggestions for the improvement of the public livestock extension activities in the study area.

### **Methods and/or data sources; or theoretical/philosophical themes**

Faisalabad District was selected purposively as it has the largest number of registered farmers under the Virtual Governance System among all districts of the Punjab. The study used a Cross Sectional Research Design. The sample size was calculated by using an online sample size calculator by keeping the Confidence Interval 5% and Confidence level 95%. The calculated sample size was 383 farmers. The sample was taken proportionately from each tehsil of the selected district. After insuring the reliability and validity of the interview schedule, data were collected and analyzed by SPSS. The interview schedule was tested for the content as well as face validity by the supervisory committee. 30 respondents who were not the part of sample were interviewed by the researcher to ensure reliability of the research instrument. All the data were entered in SPSS for calculating the reliability coefficient. The calculated value for Cronbach Alpha was 0.720. All data was collected through face to face interviews by the researcher. The data collection process was completed in the Fall of 2019.

### **Results, products, and/or conclusions**

The overwhelming majority (96.3%) of the farmers reported a need for information regarding animal health. Similarly, 60.6% and 58.5% of the farmers also need information regarding animal feed and animal breeding respectively. However, only 36% farmers desired the information related to animal housing. Only 11.5% farmers got animal breeding information from the public field staff while 48% and

17.2% farmers consulted private veterinary field staff and fellow farmers respectively for breeding information. Faraz et al. (2019) reported that farmers did not have much knowledge about animal breeding. 24% of the farmers acquired health related information from the public field staff. Similarly, a simple majority (55.6%) of farmers got such information about animal health from private sources and 18.3% farmers consulted their fellow farmers. 99.2% farmers rely on their personal experience too for the health management of their animals. Grace et al. (2008) reported that almost every farmer knew little bit about animal health management practices in the study area. Diseases included fever, ticks, Foot and Mouth Disease and Mastitis as reported by 84.1%, 71.3%, 47% and 46% farmers respectively. Different diseases of animals were reported in Pakistan included i.e. Foot and Mouth, Hemorrhagic Septicemia, Mastitis, Fever, Ticks Infestation, Rinder pest in the cattle and Anthrax and Enterotoxaemia in the sheep and goat (Idrees *et al* 2007., Ashfaq *et al.*, 2014., Iqbal and Ahmad, 2002).

### **Recommendations, educational importance, implications, and/or application**

The resulting recommendations for the L&DD Department include: there is a need to monitor the visits of Veterinary Officers and Veterinary assistants to ensure their regular visits; the L&DD officials should provide cost-free services to the livestock farmers; field staff should be strictly prohibited to receive payment from the farmers; Veterinary field staff should be flexible while dealing with the farmers, so that farmers feel free to contact the veterinary staff to access services; properly operate and maintain the L&DD helpline; better monitor the L&DD vaccination activities to follow the recommended schedules; ensuring the availability of affordable/subsidized pure-bred inseminating material and explore alternative ways to raise/make needed funds to provide the services; and more regular field days and other educational activities for the livestock farmers. Farmers believe that extension information delivery is relatively biased towards large or influential farmers. It is recommended by the farmers and the researcher that every farmer be made more aware of the new programs and incentives that have been initiated by the government for farmers; there is a need to develop a comprehensive livestock policy while keeping in view the target population and their resources; and the government should strengthen the public livestock extension system by drafting livestock extension policy.

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**Understanding Niche Markets for Luxury Flowers: Implications for Economic  
Development in Mexico**

**Authors**

**Luis A. Flores, Ph.D.**

Luis.flores96@anahuac.mx

Universidad Anáhuac Puebla

**Patricia Porrás-Loaiza, Ph.D.**

patricia.porras@udlap.mx

Universidad de las Américas Puebla

**M. Craig Edwards, Ph.D.**

craig.edwards@okstate.edu

Oklahoma State University

**Keywords:** floriculture; market analysis; orchids; smallholder farmers

# **Understanding Niche Markets for Luxury Flowers: Implications for Economic Development in Mexico**

## **Introduction/Theoretical Framework**

Luxury's association with flowers goes far back in time. Flowers were an indication of good living, and an imperative attribute signifying the magnificent lifestyles of royalty. The Dutch were obsessed with tulips in the early 17th century (McNeil & Riello, 2016; Zwart, 2003). Apart from out-of-season aromatic flowers, orchid blooms are often the most sought-after (McNeil & Riello, 2016). Propagated originally for commercial purposes in England in 1812, orchids remain one of the most expensive floral products and considered a badge of elegance, refinement, and wealth.

Explorations for rare flowers continue today. The excitement that rare flowers generate, and their increasing cultivation show the esteem and economic value such holds (McNeil & Riello, 2016), which may positively affect economic growth through innovation and the adoption of new technologies and practices (Rogers, 2003), including by smallholder farmers growing for previously untapped markets (Flores et al., 2021).

Flowers are also a prevailing motif in ballads, legends, and songs, as well as in applied arts, architecture, painting, and everyday life, used as decorations or gifts, and symbols of significant events in the human experience. Therefore, high demand exists for floral products because of their numerous uses and meanings (Anumala & Kumar, 2021; Dica et al., 2018; Flores et al., 2021; Kalmegh & Sing, 2016). Due to the relentless progress of greenhouse technologies, marketing strategies, plant biotechnology, and improved infrastructure, floricultural products have created a worldwide hub of competitiveness and innovation (Kalmegh & Sing, 2016).

Niche marketing, this study's theoretical framework, is a progression of carving out, preserving, and offering a valued good or service to a narrow portion of a market displaying differentiated demands (Toften & Hammervoll, 2013). New niches start with an analysis of the market, which defines a new sales space with potential consumers (Farhana & Swietlicki, 2020). Changes in contemporary consumer behaviors have led to new meanings and perceptions of luxury. This *new luxury* is defined as products and services with higher levels of aspirations, experiences, qualities, and tastes than other goods in the same categories (Atwal & Williams, 2009). Global luxury markets overall reached \$1.2 trillion euros (~\$1.5 trillion USD) in 2018 (D'Arpizio et al., 2019). Floricultural products are estimated to have a market value of \$250 billion USD by 2025 (Kumar & Vazhacharickal, 2020). The world trade value of cut-flowers was \$8.94 billion USD in 2019 (OEC, 2021).

A crucial element when assessing a firm is its demand conditions, i.e., "the nature of home-market demand for the industry's product or service" (Porter, 2008, p. 182). Market access also plays a significant role in boosting economic growth (Escobal et al., 2015; Swanson, 2006). The idea of starting a venture should derive from the expressed need for a particular product or service, either because companies are not meeting the demand or no such offering exists (Fleitman, 2000; Swanson, 2006). Therefore, marketing information is indispensable for strategic decision-making (Hair et al., 2019) and needed to formulate an organization's goals (Anderson, 1982; Porter, 1996; Walsh & Lipinski, 2009), including the production or procurement and sale of luxury products.

### **Purpose/Objectives**

This study's purpose was to explore whether a niche market existed for luxury flowers, especially regarding orchids, among students at a university in Mexico. Three objectives guided

this inquiry: 1. Describe respondents' personal characteristics; 2. Describe respondents' consumer awareness regarding luxury flowers, including orchids; and 3. Assess indicators of respondents' demand for luxury flowers.

### **Methods/Data Sources**

This cross-sectional study used descriptive survey methods to collect data from 380 students at the University of the Americas Puebla (UDLAP) in the State of Puebla, Mexico. UDLAP is one of the most expensive universities to attend in Latin America and admits some of the wealthiest students in Mexico (Padilla, 2019). The sample size needed for this study was  $n = 380$ , which was obtained, and had a margin of error of 5% and confidence level of 94.87% for an acceptable reliability estimate (Arya et al., 2012). The study's questionnaire was reviewed by faculty of the School of Business and Economy at UDLAP to establish content and face validity (Creswell & Miller, 2010; Gay et al., 2006), and administered in person. Data were analyzed using Microsoft Excel.

### **Selected Results**

Most respondents, 268 (70.53%), were female; 109 (28.68%) were males. Three (0.79%) did not provide an answer. More than three-fourths, 322 (84.73%), were bachelor's degree-seeking students, 38 (10.00%) were pursuing master's degrees, nine (2.37%) were doctoral students; and 11 (2.90%) did not indicate. Their ages ranged from 16 to 55 years ( $M = 22.59$ ).

In describing the respondents' appreciation for flowers, we found that 354 (93.16%) agreed to appreciating flowers; and 26 (6.84%) reported to not like flowers. In identifying their most important considerations when purchasing flowers, 164 (43.16%) selected quality, 158 (41.58%) referenced type, 46 (12.11%) indicated price, nine (2.37%) said service quality; three (0.79%) did not respond. A majority (89.21%) indicated knowing orchids. Regarding types of



orchids, Vandas were the most recognized; almost one-fifth (19.47%) indicated knowing it, and Dendrobium (5.00%) was the least known. Less than one-third (29.47%) disclosed having orchids as home. More than one-third (37.11%) perceived that the orchids sold in existing markets did not meet their quality expectations.

### **Conclusions, Implications, Recommendations, Educational Importance**

Our findings pointed to a potential niche market for luxury flowers, including orchids, among future college graduates with the likely requisite buying power (Farhana & Swietlicki, 2020) who perceived a need for such purchases (Toften & Hammervoll, 2013). Therefore, our results may hold useful information for the floriculture industry and potential entrants. However, we recommend researching other related sectoral strategies and variables, i.e., chance, competitors, factor conditions, firm strategies, government policies, structures, and supporting industries (Porter, 2008), and to replicate this study to further evaluate its reliability. Regional conditions in Mexico should be examined to determine if development initiatives involving new producers of luxury flowers, including smallholder farmers, are achievable with the facilitation of extension services (Flores et al., 2021).

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# Perceived educational needs of Iranian agriculturals' students towards agricultural new conceptual trends

Soroush Marzban<sup>1\*</sup>, Mohammad Sadegh Allahyari<sup>2,3</sup>, Saeid Firuzi<sup>4</sup>, Mojdeh Maleki<sup>1</sup> and Tarek Ben Hassen<sup>5</sup>

<sup>1</sup> PhD Candidate of Sustainable Agricultural Education and Extension, Department. of Agricultural Extension & Education, School of Agriculture, Shiraz University, Iran.

<sup>2</sup> Associate Professor, Department of Agricultural Management, Rasht Branch, Islamic Azad University, Rasht, Iran.

<sup>3</sup> Extraordinary Associate Professor, North-West University, Faculty of Economic and Management Sciences, South Africa

<sup>4</sup> Associate Professor, Department of Agronomy, Rasht Branch, Islamic Azad University, Rasht, Iran.

<sup>5</sup> Program of Policy, Planning, and Development, Department of International Affairs, College of Arts and Sciences, Qatar University, Doha 2713, Qatar

## Introduction

Agricultural production is the backbone of food security worldwide. Nevertheless, agriculture often places significant pressure on natural resources and the environment, making sustainability critical for its future development. Accordingly, many new concepts, trends, and methods are emerging in modern agriculture. In addition, agricultural university students are the drivers of change in food production. Therefore, their knowledge regarding new concepts plays an essential role in applying sustainability in agriculture and food production activities. Indeed, universities and educational institutions have the leading role in human capital development (i.e. leaders, experts, scientists, researchers, and professionals) for encountering new challenges (Council, 2009; Khomiakovska, 2019; Qingsong, 2006; Rahm & Huffman, 1984; SUN & DONG, 2006). Improving human capital is a fruitful success regarding agricultural challenges for improving knowledge, skills, and performance of experts and agricultural sector activists (Liebowitz, 2012).

Accordingly, this paper aims to investigate students' knowledge of new agricultural conceptual trends. Therefore, firstly, we explored the new concepts by reviewing the literature. Accordingly, we established a list of 38 concepts such as organic farming, precision agriculture, multifunctional agriculture, smart agriculture, family farming, urban agriculture, integrated farming, entrepreneurial agriculture, vertical agriculture, biological fertilizers, gastronomy, slow food, etc.).

## 1 Material and methods

The study is based on a non-experimental research design using a cross-sectional survey among students of agricultural faculties. According to the Iranian statistical database, less than 130,000 students are studying agricultural majors (IRNA, 2020). Data were collected using an online survey through the platform Porslin ([www.survey.porslin.ir](http://www.survey.porslin.ir)). Reaching

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\* Corresponding Author

Soroush Marzban  
Department of Agricultural Education and Extension  
School of Agriculture Shiraz University, Shiraz, Iran

Email:  
[s.marzban@shirazu.ac.ir](mailto:s.marzban@shirazu.ac.ir)  
[soroush.marzban@gmail.com](mailto:soroush.marzban@gmail.com)

several students was limited by the COVID-19 pandemic, so we used Mont Carlo techniques to increase the analysis' accuracy. We also used Borich's (1980) needs assessment model to structure the results (Borich, 1980). We solicited a panel of five agricultural university faculty members to review and advise on the validity and the reliability of the importance and competence scales we used. Afterward, we used our instrument to conduct a national study.

The questionnaire included 82 items, a mixture of multiple-choice and open-ended questions. Six items were related to students' demographics. The 76 needs assessment items addressed various new agricultural concepts and topics. For each item, respondents were asked to indicate the importance by seven-point Likert scale (0 = Not important to 6 = Very important) and also assess their perceived competence again with a seven-point Likert scale (0 = Not competent to 6 = Very competent) to teach or learn about agricultural new conceptual trends topic.

We used the IBM® Statistical Package for the Social Sciences (SPSS©) Version 22 software to analyze the data. We used descriptive statistics (i.e., frequencies and percentages) to analyze the students' demographic characteristics. We also used descriptive statistics (i.e., frequencies, means, and standard deviations) to analyze the student's perceived importance and competence of each agricultural conceptual topic. We set limits by measuring standard deviation distance from the mean (Mean  $\pm$  S.D.) to aid the interpretation of measures of central tendency derived from the scale items. To explore the educational needs, we used the Wilcoxon test between the perceived importance and competence of each agricultural conceptual topic.

## 2 Results

The respondents' socio-demographic characteristics indicate that 58% are women, and 51.7% are between 25 and 35 years old, with an average age of 31.76 years. Most of them were Ph.D. students (42%), and 34.5% were master students. Results show that 59.3% of the respondents did not participate in extra educational workshops. Most of none academic educational channels were scientific journeys (63%), workshops (58%), festivals, and other events (45%). Wilcoxon test result shows no significance between perceived importance and perceived competence of transgenic products topic, which have been the subject of much media discussion in recent years. Less educational needs refer to family farming (mws=0.793,  $P < 0.01$ ), and most educational needs mentioned cash crops (MWDS=13.32,  $p < 0.01$ ).

We grouped educational needs into three groups using the mean of Borich educational need (9.125) and Standard deviation (2.405). The first group includes Low educational needs (less than MWDS = 6.72), such as Family farming, Urban agriculture, Climate impact, Organic farming, LCA, Hydroponic culture, etc. The second group, the Moderate educational needs (MWDS = 6.72 to 11.53), includes twenty-four topics (i.e. Entrepreneurial agriculture, Integrated farming, SDG, Biological fertilizers, Vertical agriculture, Smart agriculture, Far cross country cultivation, Biofuels, IPM, Multifunctional agriculture, IWM, Green energy, IIM, Conservation tillage, Producer organizations, Food sovereignty, Precision agriculture, Modern ICTs, Green economy, Integrated fertility management, Circular economy, Agroforestry, Image processing, Agrotourism). The third group is the high educational needs, including carbon labeling, gastronomy, slow food, phytoremediation, water footprint, cash crops, and carbon sequestration.

## Conclusion

According to the research results, students' need for education has been significant except for transgenic products. Several concepts need extra attention and education. According to the extent of their recognition and presentation in various societies, both scientific and executive, the level of different educational needs has been significant. The results showed a low average of skills or knowledge perceived about new agricultural concepts. This indicates the low level of awareness of agricultural students in Iran about new concepts in agriculture. The most needed educational needs are concepts of carbon label, gastronomy, slow food, phytoremediation of water footprint, liquidity plant, and carbon sequestration.

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**International Graduate Students' Classroom Experiences in U.S. Agricultural Education  
and Extension Programs**

**Fallys Masambuka-Kanchewa, Ph.D.**

Iowa State University

Department of Agricultural Education and Studies

513 Farmhouse Lane

217C Curtis Hall

Ames, Iowa, 50010

[fallymk@iastate.edu](mailto:fallymk@iastate.edu)

**Shuyang QU, Ph.D**

Iowa State University

Department of Agricultural Education and Studies

**Lauren Cline, Ph.D.**

Oklahoma State University

Department of Agricultural Education, Communication and Leadership

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**Introduction**

Postsecondary agricultural programs in the United States (U.S.) serve as model for improving agricultural development, making the programs attractive to international students (Study International, 2021). Agriculture Extension and Education (AEE) programs are known to be dominated by white males, raising questions on how minority students effectively interact in these environments (Hartmann & Marti 2021). International students face prominent challenges as they must learn and use a second or third language (Lee & Rice 2007). Despite increased presence of international students in AEE programs in the U.S., little is known regarding their learning experiences. Recognizing international students' experiences and perception is crucial in ensuring that U.S. agricultural programs continue to serve as a model for global agricultural development.

### **Theoretical Framework**

Critical Race Theory (CRT) seeks to unveil structural arrangements that inhibit minorities from participating fully in the society (Treviño et al.,2008). It is used to examine experiences of historically underrepresented groups in learning institutions (Ledesma & Calderón, 2015), and evaluate the impact of education practices on promoting equality (Dixson et al, 2018). Minority students face challenges such as “discrimination”, “cultural adaptation”, and “academic difficulties” (Wei et al., 2011, p. 416). Retaining students from a diverse background has been one of the challenges facing U.S. AEE programs (Swinehart,2013). Failure to recognize challenges faced by diverse students and lack of knowledge on how to promote participation may hinder success of AEE programs (Bowen, 1993).

### **Purpose and objectives**

The study explored experiences of international graduate students in the U.S. AEE programs. Specifically, the study sought to:

1. Describe the international graduate students' perceptions of course content in AEE programs.
2. Describe the international graduate students' classroom experiences in AEE programs.

### **Methods**

An explanatory sequential mixed method was employed (Creswell et al., 2003). A two-phased approach was applied when collecting the data, beginning with the quantitative phase where questionnaires were administered to 26 current and past international students through Qualtrics. The respondents were asked to indicate interest to participate in a follow-up key informant interview. Out of the 26 respondents, 12 showed interest and participated in the interviews. The questionnaire which was modified from Cline et. al., (2020) assessed respondents' personal experiences in the classroom (e.g. interaction with other students and instructors) and perceptions of the courses (relevance of the content to global settings) using a 7-point Likert scale. Two constructs (personal experiences and perceptions of courses) were created and deemed reliable (Cronbach  $\alpha = .85, .91$ ). SPSS version 26 was used to analyze the quantitative data where descriptive statistics were generated. Qualitative data was collected through virtual key informant interviews was analyzed using MAXQDA. The data was coded by two researchers based on the constructs that were identified in the survey. The emerging themes and sub-themes were used to inform the quantitative results.

### **Results**

The survey results revealed that the participants neither agreed nor disagreed that the course materials offered in the AEE programs provided a global emphasis ( $M = 4.18, SD = 1.46$ ). All the interview participants expressed that the course materials heavily focused on the U.S. as

evidenced by the following quote from participant E, “When a class primarily uses U.S. examples, especially without a detailed introduction of the background of the history and the system, I feel disengaged and difficult to participate.”

Regarding personal experience in the classroom, survey results indicated a relatively positive experience ( $M = 5.37, SD = 1.18$ ). *Understanding and embracing international students' experiences and language* emerged as one of the themes during the key informant interviews. Participant A shared, that being asked “examples for my home country” and “follow-up questions” made them feel that they were “included and valued.” Similarly, Participant F shared with gratitude that the instructor allowed them to submit part of their assignment in a foreign language because they understood the concepts easier using their first language and had all the software on their computer installed in their first language.

Besides the positive experience, participants reported *feeling unnoticed in class*: “[instructors and classmates] seem to be less interested in what I say than what domestic students' say... The class reaction [of my responses] is noticeably less lively in class.” (Participant D). This was echoed by participant C, “I don't feel our background and our story are appreciated in many classes.” Furthermore, all but one participant reported feeling uncomfortable expressing themselves in class due to reasons including self-consciousness of English fluency, fears of being misunderstood due to their accents, and feeling of being judged by their perspectives.

### **Conclusion, implications, and recommendations**

The results indicated that course materials in AEE programs do not fully cover topics from a global perspective making them inefficient to meet the needs of international graduate students. The presence of supportive instructors and peers were reported as being instrumental

for the international graduate students' success. Specifically, instructors' and domestic students' value of diverse perspectives contributed towards the students' positive experience. To better include international students, we recommend incorporating course materials beyond the U.S. context. Instructors are encouraged to be intentional and creative when selecting class activities to engage all students. Incorporation of global perspectives will not only assist international students but also be useful for domestic students who wish to work internationally. Contrary to popular beliefs, the international students appreciated being put on the spot in class especially when there is a genuine interest to learn from the instructor and peers. Instructors should allow international students to fully share their stories because explaining a phenomenon in a foreign culture take additional time and efforts.

Despite the survey results indicating international graduate students feeling supported and treated fairly in the AEE classrooms, inconsistencies were observed in participants' responses in the interviews. The presence of such inconsistencies points out to the need for using mixed methods research, where quantitative findings provide big picture and qualitative results provides context (Desimone et al, 2004). The inconsistencies in the responses between the survey and the interviews speak to the challenge of using quantitative methods alone in capturing complex issues such as racial justice (Garcia et al., 2018).

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# **Reflective Perspectives of Host and Guest Participants of an International Professional Development Experience**

Melanie Miller Foster, The Pennsylvania State University

mjm727@psu.edu

106 Agricultural Administration Building

University Park, PA 16802

Joseph Y. Cho, The Pennsylvania State University

Laura Rice, The Pennsylvania State University

Brad Kinsinger, Hawkeye Community College

Daniel Foster, The Pennsylvania State University

Nur Husna Abd Wahid, Universiti Teknologi Malaysia

## **Introduction**

Education abroad provides a unique space for student transformation. As such, the literature on education abroad is replete with studies focusing on the traveling student and their learnings. However, recent studies have brought to light the potentially problematic effects of traditional education abroad models establishing neocolonial economic and cultural relations (Ramirez, 2013; Smaller & Sullivan, 2018). Education abroad is generally acknowledged to play a key role in developing global-ready graduates and remains a significant method of internationalization in higher education (De Wit & Altbach, 2021). While education abroad continues to proliferate, new models of education abroad need to be identified and studied to develop new strategies that benefit both the traveling and host populations.

There is substantial research previously and currently conducted surrounding the impact of study abroad students and their host communities and families. Numerous scholars have highlighted the importance of examining the perspectives of community members in contact with visiting university students participating in community-engaged education abroad programs (Caldwell & Purtzer, 2015; Gelmon et al., 2009). Schroeder et al. (2009) focused their research on several important and pointed questions about the ways that U.S. students could be impacting the communities that host them abroad, of which asserted that students inevitably have environmental, economic, cultural, and social impacts on those they encounter abroad. Habashy (2019) found it essential to recognize that local community members may have different priorities for a service learning program beyond those determined by a university or organization.



Previous studies indicate that interaction between domestic and international students in the United States university classroom, when nurtured and facilitated, offers opportunities for all students' development and learning (Deardorff, 2006; Mestenhauser, 2011; Parsons, 2010). However, few studies explore the college students' perspectives from the hosting country of study abroad programs.

The theoretical foundation of this study was Mezirow's Transformative Learning Theory (2003). A tenant of this framework states that learning occurs when an individual encounters an alternative perspective that calls to question previous assumptions.

### **Purpose and Objectives**

The study collected, compared, and contrasted the impacts of a specific immersion program from the perspective of both the host and the guest pre-service teachers. The study aims to describe and compare structured reflection responses between U.S. and Malaysian participants during an international immersive experience.

### **Methods**

A total of 20 participants participated in an immersion experience in Malaysia over twenty-six days, which included both U.S. and Malaysian participants. The participants consisted of six pre-service agricultural educators from U.S. and eight pre-service life skills education teachers from Malaysia. All the participants participated in the same activities throughout the entirety of the program and thus served as the population of this study.

#### **Data Collection: TIPS Framework**

The participants were required to write a daily reflective journal called TIPS journal. The TIPS journal is a self-reflective journal developed by Anu Taranath (University of Washington, 2014). TIPS is an acronym that stands for *Things, Ideas, People, and Self* (Taranath, 2014). Each participant reflected and wrote one entry per day in each of four categories. For the first three categories, participants were prompted to reflect and identify the most impactful *Things, Ideas, and People* that they learned or interacted with that day. Participants also reflected on *Self*, or what they learned about themselves that day.

#### **Data Analysis**

Content analysis was used to categorize, code, and analyze the participants' journal entries. Data was collected from individual participants throughout their 26 days in Malaysia. A total of 2,060 entries were recorded, with around 515 entries per construct. The content analysis process followed the steps proposed by Ary et al. (2010).

Three research team members coded the data collected for the research and achieved intercoder reliability of 90%.

## Results

Each construct had different number of themes. A total of 14 themes emerged for *Things* which included agriculture and education. A total of nine themes emerged from *Ideas* including agricultural best practices and community and culture. A total of 15 themes emerged for *People* which included Malaysian life skills student and U.S. pre-service agricultural educators. Lastly, four themes emerged from *Self* which included global competency and educational aspects. Many of the themes that most frequently emerged for *Things*, *Ideas*, and *Self* category were similar. However, *People* category had a distinct difference of themes that most frequently emerged.

## Conclusions, Discussion, and Implications

The immersion experience in Malaysia had foreign (guest) and domestic (host) participants. U.S. participants were immersed in a new environment and new culture, while Malaysian participants shared aspects of their country and culture with the guests.

Despite the difference in nationality and culture, both parties reflected on similar learning themes throughout the experience in the *Things* and *Ideas* categories. The findings in these two categories are unsurprising because the program goals were focused on the interaction of agriculture, education, and culture. U.S. participants and Malaysian participants had predictable differences in the most frequently occurring themes within the *People* category. While all group members were exposed to a wide range of individuals throughout the experience, U.S. participants noted they were most impacted by Malaysian participants, while Malaysian participants indicated they were most affected by U.S. participants. This finding provides support for the importance of facilitating close connections between traveling and hosting individuals.

The most interesting finding is the similarity in reflections in the *Self* category. Both U.S. and Malaysian participants had the highest rate of reflection on the theme of global competency. This finding is expected for the U.S. participants who had the opportunity to immerse themselves in a new country and culture in Malaysia. Interestingly, the frequency of the theme from the host group supports the idea that the experience provided host participants ample opportunity to reflect on their global competency. Future studies should further investigate the specific global competency gains in hosting individuals.

Global learning is a lifelong endeavor and does not take place within the confines of a single international travel experience. One option to engage students in global learning in domestic contexts is through hosting international groups. This study supports the notion that there are benefits to students who closely engage with international individuals through hosting activities.

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**A Retrospective Inquiry into the Impact of COVID-19 on Agriculture Students'  
Experiences on a Study Abroad Trip to the United Kingdom**

**James D. Scott, University of Georgia**  
405 College Station Rd., 129A Four Towers  
Athens, GA 30602  
[jamesd.scott@uga.edu](mailto:jamesd.scott@uga.edu)

**Jade L. Frederickson, University of Georgia**

**Eric D. Rubenstein, University of Georgia**

Keywords: international travel, study abroad, experiential learning, COVID-19, pandemic

## **Introduction**

Original cases of the novel coronavirus disease 2019 (COVID-19) were first discovered in Wuhan, China in December of 2019. By the end of January 2020, the World Health Organization declared COVID-19 to be a “public health emergency of concern” (Kennedy, 2020). By March 11, 2020, the World Health Organization (WHO) declared COVID-19 to be a global pandemic (Centers for Disease Control and Prevention, n.d.; World Health Organization, 2020). At the time, millions of students of all ages in various educational settings were either in school or on educational breaks, some were studying abroad. Following this declaration from the WHO, educators, students, families, and other individuals alike were on edge, uncertain of their next steps (Kennedy, 2020).

## **Review of the Literature**

Study abroad experiences are generally acknowledged to beneficially impact students’ education (Roberson, 2018; Stone & Petrick, 2013). Primarily these experiences root themselves in the foundations of experiential learning, a concept initiated by Dewey (1938) and most recently expanded upon by Kolb (1984), where the instance of travel provides students with an opportunity to be flexible, reflect, and learn (Roberson, 2018; Stone & Petrick, 2013). Study abroad experiences additionally often introduce students to other cultures, social norms, and attitudes. Though generally touted as advantageous for learning, study abroad experiences may play a negative role in students’ lives when other stressors, such as the onset of a pandemic, occur (Garbóczy et al., 2021; Jungmann & Witthöft, 2020).

Being away from home during these periods of increased stress may contribute to health anxiety, which is defined as “worries and anxiety due to a perceived threat to health” (Jungmann & Witthöft, 2020, p. 2). Two days after the WHO declared COVID-19 to be a global pandemic, President Donald Trump issued travel restrictions for Americans to either (1) avoid international travel or (2) return immediately to the United States (Fanari & Segrin 2021). Students on study abroad trips were to adhere to these restrictions; consequently, universities across the states worked to return their students home as soon as possible (Connors, n.d.). Students were welcomed home by the stress of the uncertainty surrounding the pandemic, such as its pathophysiology, implications for education, and long-term health effects (Fanari & Segrin 2021).

## **Purpose and Objectives**

The purpose of this study was to examine the impact of COVID-19 on college-aged students’ study abroad trip experiences to the United Kingdom. The guiding objectives for this study were:

1. Address participants’ overall knowledge, thoughts, and experiences with COVID-19 prior to, during, and upon completion of the study abroad trip.
2. Discern proactive/reactive/latent expectations, reactions, and actions either because of or despite what we now know was a looming pandemic.
3. Learn about COVID-19’s impact on students’ overall experiences in Scotland and throughout the United Kingdom.

## **Methods**

Researchers conducted individual interviews with three participants 18 months after their study abroad experience. Interviews sought to determine how students viewed the summative impact of COVID-19 on their study abroad experiences. Researchers employed a semi-structured interview protocol that asked participants to consider their knowledge of COVID-19, thoughts while traveling abroad, and experiences returning to the United States. Interviews were conducted via Zoom and ranged between 60 and 80 minutes. To uphold trustworthiness and rigor, researchers assigned participants unique pseudonyms, utilized member checking and peer debriefing, and referred to interview memo notes.

Researchers selected participants based on their range of study abroad experiences to gauge the true impact of COVID-19: one had previously traveled abroad, one had previously participated in a study abroad, and one had never traveled internationally or studied abroad. Researchers noted that limitations exist because of the use of qualitative research leading to a small sample size; therefore, generalizations and impact are likewise confined.

Following interview transcription, researchers used ATLAS.ti8 to analyze and code data using Lincoln & Guba's (1985) constant comparative method. Researchers reanalyzed the data for similarities prior to refining more distinct themes, then formulated explanations about COVID-19's impact on students' study abroad experiences.

## **Results/Conclusions**

Researchers identified several overarching themes: thoughts before travel, impact on teaching, impact on travel, and impact of quarantine upon return to the US emerged as the largest influences.

Regarding thoughts before traveling, researchers identified subthemes of precursory awareness of COVID-19 and excitement surrounding the upcoming experience. Jamie mentioned she was aware of COVID-19 because of her statistics professor, who often discussed current events to increase the relevancy of the subject. Each participant expressed excitement about traveling abroad. Both Stella and Jamie expounded this idea, citing the different cultural aspects of the United Kingdom as the reason.

Participants also explained their reactions to the school visits and travel, particularly, COVID-19's impact on both of these aspects. Each discussed the premise of "pivoting" and relayed that alternative plans were important if COVID-19 was to impact any day on the trip. Jamie continuously mentioned the idea of "pivot," which seemed to best summarize part of their experiences. Additionally, participants detailed their reactions to learning their University would close for two weeks.

Participants furthermore spoke about the impacts of quarantine upon returning to the US. All three also discussed the experience of traveling internationally and returning to the Atlanta International Airport after learning President Donald Trump had closed the borders. When asked about returning, Andrew said, "Yeah, so before we got off of airplane in Atlanta, they told us we would need to quarantine for two weeks. They gave us a packet of information, try to monitor symptoms, what to do if you get sick." Jamie was overwhelmed, stating, "I'm having to figure out a lot of factors all of a sudden, and I can't do anything about it because I've got to quarantine for two weeks."

## **Recommendations**

Researchers recommend the following for future research and educational programming.

- Conduct interviews with students who engaged in, or did not engage in due to cancellations, study abroad trips that occurred around this same time period;
- Examine and articulate the student experience of engaging in study abroad shortly before, during, and immediately following the declaration of the COVID-19 pandemic.

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**Picture This:  
Using Photovoice to Increase Student Engagement and Cultural Awareness in  
Agricultural Communications Courses**

***Shannon L. Norris***  
***Assistant Professor***

Department of Agricultural and Extension Education New Mexico State University P.O.  
Box 30003, MSC 3501 Las Cruces, NM 88003-8003  
[norriss@nmsu.edu](mailto:norriss@nmsu.edu)  
575-590-0030

*Keywords:* agricultural communications, cultural awareness, photovoice

**Picture This:**  
**Using Photovoice to Increase Student Engagement and Cultural Awareness in**  
**SEP Agricultural Communications Courses**

**Introduction and Theoretical Framework**

Engagement is key to student participation and success in college classrooms (Bovill, 2011). Traditionally, engagement occurs best when students can kinesthetically, visually, or auditorily participate with course content. Activating all types of learning in college classrooms helps students increase ownership in course material, which have a positive influence on retention, self-efficacy, and content mastery (Bovill, 2011). Stefanou et al. (2004) also suggested engagement occurs through autonomy of learning where students take ownership in the organization and procedure of classes as well as of their individual learning.

Course engagement is one of many instructional elements disrupted by COVID-19, especially in courses where global experiences and travel are key to the learning outcomes. Beyond the limitations of access to global travel, varying access to course materials and broadband connections have also reshaped how instructors incorporate engaging activities in courses. While many factors pose challenges, one opportunity to increase student engagement is the placement of students in their home environments to learn from their surroundings. Connecting to students' home and cultural environments, especially in online or hybrid settings, allows them to associate learning objectives with their interpretation of the content.

Photovoice is a pedagogical tool centered in critical thinking and observation of a student's personal surroundings (Wang & Burris, 1994). Photovoice is a qualitative research method where participants contribute to action research (Hernandez et al., 2014), which in turn drives ownership in course material. Using photovoice, students can capture images they believe appeal to a certain theme and express internal comprehensions. In international contexts, photovoice allows students to express their interpretations of different cultures (Kelly et al., 2018). In these scenarios, students can bridge past cultural gaps while engaging in peer-to-peer instruction.

Grounded in Conger and Kanungo's (1988) empowerment theory, photovoice helps students investigate relationships between cultures, social issues, and organizational environments. Photovoice historically has been used to help marginalized populations communicate (Lichty et al., 2019; Wang & Burris, 1994). Kelly et al. (2018) acknowledged when "students become active participants of image gathering and interpretation, learning arises from increased visual literacy and exploration of cultural bias" (p. 69). Photovoice also helps address the complex problems (Andenoro et al., 2016) by enabling students to express their understandings about social and community issues through photography, reflection, and discussions (Lichty et al., 2019). Photovoice can also serve as a valuable tool to investigate global issues and contexts.

**Purpose and Objectives**

The purpose of this innovative idea was to increase student engagement expectations on the first day of a junior agricultural communications course. The objectives were (1) to have students interpret the mission of the course, "building legacy, establishing impact, and reinforcing a brand", using photovoice, and (2) elicit discussion on strategies to reinforce these priority areas.

## **Method**

The opening day of classes, colloquially referred to as “syllabus” day, is often when educators cover expectations of the course, upcoming assignments, and grading requirements. Syllabi serve as an agreement between students and faculty; however, when instructors dive into the syllabus overview without setting up why the course exists, student ownership in guiding the direction of the course is often discouraged. In these scenarios, not only are the students’ ownership in the class hampered, but their guidance in cultural and social interpretations of the course’s learning outcomes are also hindered.

To increase student engagement and cultural awareness, I incorporated a photo elicitation challenge on the first day of a junior-level agricultural communications course at New Mexico State University. In this challenge, I encouraged students to take three photos that represented “legacy, impact, and brand”. Students then discussed how “legacy, impact, and brand” connected to agricultural communications in local, regional, national, and international settings. Students took photos of their surroundings, shared their reasoning, and made connections to other student responses. Next, students wrote 2–3 suggestions for how to incorporate these suggestions into the course content. At the end of the discussion, I shared the syllabus with the students and set the expectation that the syllabus would serve as the guide to how to build “legacy, impact, and brand” in global communications and that their responses would provide insight for diving deeper into cultural and societal norms and issues related to the course.

## **Results**

The results were extremely positive. Students expressed their understanding of “why” the course existed by understanding the reasoning for the course structure and assignments. Sharing their interpretations of their photos connected to “legacy, impact, and brand” also produced a fruitful discussion related to why these three priority areas should exist in communication courses. Students shared statements like, “communicators are connectors who help an audience establish a brand,” and “our messaging can have an impact in multiple contexts and with multiple audiences if we seek to know what is important to them and tailor our message to different people.” These acknowledgements and realizations at the beginning of the course was vital to setting an open learning environment based on embracing different cultures and demographics.

## **Recommendations/Educational Importance/Implications**

Using photovoice to increase student engagement with course content could be a valuable strategy to increase ownership. Using photovoice at the beginning of courses that focus on global learning outcomes or cultural awareness could also be a tremendous tool as it allows students expand their understanding of cultures through multiple interpretations. While I used this innovative idea at the beginning of my course, it could also be helpful to use when introducing a new unit, as a student-driven assessment, or to reinforce content. Photovoice also creates a welcoming environment where students can reveal their personal interpretations of critical issues in a safe environment, which reinforces peer-to-peer instruction and builds capacity for tailored communication efforts in local and global settings. Finally, photovoice can be used in international contexts for agricultural and extension educators by empowering students to demonstrate global awareness and sensitivity to other cultures through individual interpretations.

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## **Combatting Online Agriculture Misinformation (OAM): A Perspective from Political Economy of Misinformation.**

1. Dr. Ataharul Chowdhury

School of Environmental Design and Rural Development, University of Guelph, Ontario, Canada, Email: [Chowdhua@uoguelph.ca](mailto:Chowdhua@uoguelph.ca)

2. Md Firoze Alam

PhD Student

School of Environmental Design and Rural Development, University of Guelph, Ontario, Canada  
[mdfiroze@uoguelph.ca](mailto:mdfiroze@uoguelph.ca)

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## **Abstract**

### **Introduction and theoretical framework**

Ensuring the credibility and integrity of information related to farming is at the core of Agricultural Extension and Rural Advisory Services (AERAS). This has come under threat due to agricultural misinformation (for example see, Klerkx, 2021). Additionally, the neoliberal transition of AERAS has led to rapid privatization and digitalization of advisory services. Hence, the profit motive and online agricultural misinformation (OAM) are simultaneously threatening the integrity of AERAS. However, the scale and significance of the current misinformation threat are unprecedented. Online misinformation—the infodemic— has been identified as an existential threat to scientific knowledge and social institutions (Farkas & Schou, 2020; Zarocostas, 2020). The emergence of global digital capitalism is rapidly connecting previously unconnected communities to the internet, making them part of the hyper-connected digitally networked society (Castells, 2011; Zuboff, 2019). Agrarian communities are not beyond the exposure to misinformation. The spread of misinformation rose remarkably during the pandemic (Bursztyn, Rao, Roth, & Yanagizawa-Drott, 2020). However, the risk of OAM remains severely under-researched at a time when global agriculture is at a crossroads facing challenges like food security and climate emergency.

### **Implications and educational importance**

To meet the demands of the growing population, agricultural advisors and advisory organizations need to deal with online misinformation and enhance farmers' trust in digitally mediated services (see Klerkx, 2021; Wolfert et al., 2021; Stroud, 2019 ). Unfortunately, public trust in governments and scientific knowledge is at a historic low due to growing income inequality and polarization (Lewandowsky et al., 2017). Therefore, building a theoretical framework to study agricultural misinformation is immensely important to evaluate and strategize to combat agricultural misinformation available in digital spaces.

### **Purpose and objectives**

There is no systematic research to theorize agricultural misinformation that can help AERAS agencies to understand OAM. Contemporary misinformation research has been urban-centric, which looked into three main areas: political misinformation, climate change misinformation, and health misinformation (Bjornberg, Karlsson, Gilek & Hansson, 2017). This study reviews misinformation research literature in various fields to propose a theoretical framework from a political economy perspective to study OAM.

### **Data sources**

Misinformation research has experienced exponential growth after the 2016 US election. This study searched misinformation research literature published between 2016 and 2021 using

Google Scholar, ScienceDirect, Scopus and web of science. The literature was reviewed based on its suitability to the objective of the study.

### **Theoretical propositions and conclusion**

The political economy of agricultural misinformation provides an insight into the dynamics of how it is produced and propagated in digital spaces. The emergence of digital capitalism has ushered us to an age that requires connected individuals to be reduced to a space (who is no longer an individual) to be computationally colonized for profit generation (Couldry & Mejias, 2019). Digital capitalism needs uninterrupted data generation and appropriation for profit which unilaterally claims nearly all human experiences captured digitally as free raw material (Zuboff, 2019). Digital capitalism is a critical turn in neoliberal capitalism because it commodifies almost everything, including our social interactions (e.g., social media) through digital tools (Fuchs, 2019). Unlike other resources, the information does not get used up but instead continues to produce value, making it one of the most potent sources of profit extraction (Dyer-Witford, 2019). Individuals as participants of the digital network give their digital labor-power through content creation (e.g., text, image, video on social media) and attentive labor (the currency of attention economy) to generate a steady stream of data, which is the most crucial raw material for generating profit under the regimes of digital capitalism (Beller, 2019).

Capitalist extraction is materialized through producing and reproducing hierarchical relationships using social relations like race and coloniality (Gilmore, 2007). The genealogy of digital capitalism can be theorized using Beller's (2021) computational racial capitalism as a framework that shows that present-day digital capitalism is the direct continuation of historical capitalism. The data produced in the digital space dictates the offline world irrespective of its capacity to capture complex socio-economic realities inaccessible to digital technologies (O'Neil, 2016). Marx remarked: under the influence of capitalism, "all that is solid melts into air, all that is sacred is profaned" (Marx & Engels, 1967, p. 37). Digital capitalism is materializing Marx's prediction blurring the boundaries between real/biosphere (solid and sacred) and digital/Infosphere (malleable and can be profaned), albeit the two realms remain hierarchical in relations, establishing the hegemony of Infosphere over the biosphere (Floridi, 2014). Online realities become more significant in shaping our perceptions over offline realities under digital capitalism. However, the Infosphere (information sphere) is digitally constructed and often perceived to be representative (and objective) of the biosphere (offline reality), reshaping discourses and public perception (Noble, 2018; O'Neil, 2016; Zuboff, 2019). As informational agents, humans are conflating the two spheres in shaping their perception (Floridi, 2014). However, the infosphere— built on information— has consolidated its centrality, significantly dictating the reality of the biosphere (real world) with digitally constructed discourses legitimizing the authority of simulated reality over lived reality (Baudrillard, 1995; Floridi, 2014). Digital information (data) is fast becoming the most significant (if not only) fabric of reality. Digital mediation of human life is gaining unprecedented significance because data has



become the primary source of profit accumulation under digital capitalism (Zuboff, 2019, p. 14). Hence, irrespective of its accuracy, information has become the new battleground for competing stakeholders (Singer, 2018).

### **Recommendation**

The neoliberalization of the global economy has resulted in unprecedented income inequality (Harvey, 2007). The rising inequality has resulted in the disenfranchisement of many rural and agricultural communities, which has weaponized their emotions (Boler & Davis, 2020 ). Tech titans tap on the weaponized emotions of the marginalized communities to maximize their user engagement, imperative to ensure personal data generation and appropriation (Fuchs, 2017). Combating OAM requires developing a critical view that helps the AERAS collaborate with farming communities built on a theoretical understanding of OAM.

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## **Consumer Knowledge and Confidence of the U.S.-China Agricultural Trade Dispute**

Gary Wingenbach, Professor & Senior Scientist  
2116 TAMU, 261 AGLS Bldg.  
Texas A&M University  
College Station, TX, USA  
[gary.wingenbach@ag.tamue.edu](mailto:gary.wingenbach@ag.tamue.edu)

Allison Wooten, Graduate Research Assistant  
Department of Agricultural Leadership, Education, and Communications

Keywords: Agricultural trade, U.S.-China, Confidence, Knowledge

# Consumer Knowledge and Confidence of the U.S.-China Agricultural Trade Dispute

## Introduction

The U.S.-China agricultural trade dispute increased tensions between the world's two largest economic powers. Media created awareness that too few Americans understood global trade, tariffs, and ripple effects of international trade at consumer levels. U.S. colleges of agriculture help students learn about agricultural production, trade, and market issues. U.S.-China trade issues were most evident in U.S. Midwest corn, soybean, and pork producing states (Balistreri et al., 2018). American farmers were impacted more by the U.S.-China trade dispute, but we experienced tariff effects on foreign goods throughout 2018-2020. Qu et al. (2019) found 60% of Iowans supported raising tariffs on Chinese products, but more than 80% thought the trade dispute adversely affected net farm income. We speculated that U.S. Midwest college of agriculture students knew more about trade with China than did non-students (i.e., public). Wike and Devlin (2018) found younger people (18-29) perceived China more favorably than did older people (30+). Country of origin perspective affects product confidence, including Chinese consumers' confidence of infant formulas produced in China (Li et al., 2019). Most (65%) Americans had very little or no confidence in food produced in China (China, 2017). Are knowledge or confidence of products different for younger vs. older, or rural vs. urban consumers?

## Purpose and Objectives

The purpose was to determine respondents' understanding of the U.S.-China agricultural trade dispute. Research objectives were to a) test knowledge of agricultural trade issues; b) assess confidence of products affected by the trade dispute; and c) determine if significant differences existed when compared by sample.

## Methodology

A cross-sectional survey (Field, 2000) was used. Participants were from 12 U.S. Midwest states where agricultural production was likely affected by the trade dispute. College of agriculture students produced 175 responses, reduced to 131 (75% response rate) from incomplete data. The public sample produced 432 responses, reduced to 305 (71% response rate). The online instrument measured understanding of the U.S.-China agricultural trade dispute and product confidence. Knowledge was measured with 12 questions. Confidence for four product categories (i.e., food, pet food, technology, and clothing) were assessed with a Likert-type response (4-point scale). Demographics were included and descriptive analyses and tests of significance were used; alpha (.05) was established a priori.

## Results

Respondents were college of agriculture students ( $n = 131$ ) and public members ( $n = 305$ ) from 12 Midwestern U.S. states. Respondents ( $N = 436$ ) were described as white (89%), female (58%), 18-24-year-old students (35%), and from non-rural (70%) residences.

College students were significantly ( $p < .00$ ) more knowledgeable ( $M = 5.45$ ,  $SD = 2.34$ ) about U.S.-China agricultural trade issues than were the public ( $M = 4.64$ ,  $SD = 2.01$ ), although all scored below average (i.e., 75% correct = 9/12 questions). Only 12% of students and 5% of the public achieved passing knowledge scores. College education revealed itself in three questions: students outscored the public (64% to 43%) that China's population was 4 times larger

the U.S.; China's reliance on the U.S. and Brazil to supply its soybeans (68% to 38%); and China was the world's leading producer of pork (53% to 19%).

We found significant differences in confidence of products. Respondents were moderately confident in all U.S. products and Chinese technology. Overall, respondents had very low confidence in clothing, food, and pet food produced in China. However, students were significantly more confident (moderate) about food and pet food produced in the U.S., compared to the public, who had very low confidence for both items. Students were significantly more confident (moderate) about the durability of clothing produced in China, as opposed to the public (very low).

### **Recommendations**

The most glaring result was respondents' lack of knowledge about the U.S.-China trade dispute. The U.S. and China will not decouple our markets or trading arrangements (Mildner & Schmucker, 2019). Hence, we need to increase our collective knowledge about China, agricultural trade, and related issues affecting Americans and Chinese alike. We argue that factual understanding of these issues is contingent upon valid perceptions of international relations, trade, and agriculture. Public and college students cannot accept misinformation when forming opinions about U.S.-China agricultural trade issues or other international matters because it creates invalid perceptions that polarize groups (e.g., young vs. old). How much misinformation or misunderstanding of international trade is sown by the media?

We need to research participants' information sources to determine if fact-based reports are disseminated and consumed equally compared to non-factual reports. As noted elsewhere (Funk et al., 2019; Funk & Kennedy, 2016; Krause et al., 2019), more factual knowledge about science, research, and policy-driven actions, produces more favorable perceptions and trust in those working in such matters. Conversely, those with less knowledge tend to distrust science, research, and the policies derived from it. The need to educate our public and college students in matters of U.S.-China agricultural trade and related issues cannot be understated. We assert that too many invalid reports with non-factual information are being consumed by the public, making it difficult for them to form valid opinions.

We need to improve U.S. college of agriculture students' and the public's knowledge of international agricultural trade and related issues. Higher education needs updated curricula, learner experiences, and professional development workshops to help journalists improve their understanding of science, research, and policy formation so they disseminate it more accurately to the public.

Our confidence in Chinese and U.S. products may indicate the perceived importance of product quality, reliability, or durability in the marketplace; it could reflect our beliefs about international trade. While both groups were moderately confident in all U.S. products and Chinese technology, college students had more confidence than the public for all products. Are Midwestern college students more trusting, indifferent, or uninformed about products' country of origin? Are other factors, such as price, availability, or shopping preferences, affecting students' confidence levels? We need to research these issues more thoroughly because young consumers represent future purchasers. Future purchasing power may be influenced by confidence in products' quality, reliability, durability, and/or country of origin.

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**Sure sources: Understanding college student's trust in video messages about the COVID-19 vaccine from international and domestic sources**

Valentina Castano\*; Department of Agricultural Education and Communication; Center for Public Issues Education in Agriculture and Natural Resources, University of Florida

1408 Sabal Palm Drive, Second Floor  
Center for Public Issues Education in Agriculture and Natural Resources  
University of Florida  
Gainesville, FL 32611  
vcastano28@ufl.edu

Alena Poulin, University of Florida

Lauri M. Baker\*, University of Florida

Ashley McLeod-Morin\*, University of Florida

Olivia Doyle, University of Florida

Meredith Oglesby\*, University of Florida

Lisa Lundy, University of Florida

\*AIAEE Member

Keywords: COVID-19, trust, crisis communication, multimedia, vaccine



# **Sure Sources: Understanding college student's trust in video messages about the COVID-19 vaccine from international and domestic sources**

## **Introduction**

On March 11, 2020, the World Health Organization (WHO) declared COVID-19 a global pandemic (Ducharme, 2020). When the first COVID-19 vaccine was authorized for emergency use in December 2020, health organizations began communicating the importance and benefits of receiving the immunization (U.S. Food and Drug Administration [FDA] 2021). Vaccinations became more widely available and health organizations turned to numerous communication platforms to garner public trust and raise vaccination rates (Vergara et al., 2021). Past literature indicates communication can guide the public's response to changing measures during a public health crisis (Reynolds, 2006; Quinn et al., 2013). With many organizations communicating about the COVID-19 vaccine, there is a need to understand how trust in communication efforts varies between international and national sources of information.

Research shows that local sources of information are more trusted by individuals when making decisions related to their health. A U.S. study showed the highest confidence in information received from one's own physician, state health departments, and local health departments (Malik et al., 2020). Individuals who trusted communication efforts from health organizations were more likely to receive an influenza vaccine during the H1N1 pandemic (Quinn et al., 2013). This aligns with recent literature which indicates an organization's goal during crisis communication is to maintain the public's trust in order to effectively guide behaviors during a crisis (Tkalac Verčič et al., 2019). Understanding the public's levels of trust in national and international sources of COVID-19 vaccine information can help scientists and global health organizations tailor communication. Thus, it is important to understand individual's levels of trust in both international and national sources of COVID-19 vaccine information.

## **Purpose and Objectives**

The purpose of this study was to compare students' levels of trust in video communications about COVID-19 vaccines from the United Nations (UN), the U.S. Centers for Disease Control and Prevention (CDC), American Red Cross (RC), and individual U.S. scientists (IS). The study was guided by the following objectives:

RO1: Determine which sources were perceived as trustworthy sources of COVID-19 vaccine information.

RO2: Compare levels of trust between international and domestic sources of COVID-19 vaccine information.

## **Methods**

To address the study objectives, perception analyzer dials were used. Past studies have used dials to determine how the source of information impacts audience trust for a message during a crisis (VanDyke & Callison, 2018). Fifty-four college students participated in this study. Participants were assigned a numbered dial and were administered a pre-test through Qualtrics to determine demographics and perceptions of the COVID-19 vaccine. All participants watched the same videos (randomized in order). A total of 18 focus groups were held over a four-day period in July 2021. While watching the videos, participants were instructed to respond to the question “Do you find the content trustworthy?” by using their dials to rate trust on a scale of 0-100, with zero = extremely untrustworthy and 100 = extremely trustworthy. There were 5-second breaks between each video where participants set their dials back to 50, the neutral position, then were presented with the question again. The second-by-second output was condensed into 5-second segments and the averages were combined to determine the overall perceived trustworthiness of each video. The four videos tested in this study were from the UN ( $M = 47.4, SD = 9.51$ ), the RC ( $M = 46.58, SD = 9.49$ ), the Ad Council with the CDC ( $M = 56.15, SD = 8.94$ ), and two videos from individual scientists (IS), which were combined into one variable ( $M = 54.50, SD = 10.47$ ). The videos were all downloaded directly from the platform these were originally posted to. The UN, RC, and IS videos were originally posted on TikTok. The CDC video, produced by the Ad Council, was originally a television advertisement and was available on YouTube.

Data were analyzed in SPSS 26 using independent and paired sample t-tests to determine the overall level of trust for the UN, CDC, RC, and IS, as well as to analyze any statistically significant differences in trust between the message sources.

## Results

Independent sample t-tests were conducted to determine if trust in video messages were statistically above or below the neutral point for the scale, which was 50. The UN  $t(53) = -2.65, p = .01$  and RC  $t(53) = -2.01, p = .05$  were statistically significantly below 50. CDC  $t(47) = 4.76, p = .000$ ; and the IS  $t(40) = 2.75, p = .01$  were statistically significantly above 50.

Paired samples t-tests were conducted to analyze how trust in a video message about vaccines from the UN compared to similar messages from other organizations and individual scientists. Statistical significance did not exist between the UN and RC  $t(53) = -1.02, p = .315$ . However, statistically significant differences existed between the UN and CDC  $t(47) = 5.14, p = .000$ . Statistically significant differences also existed between UN and IS videos  $t(40) = -4.62, p = .000$ .

## Recommendations

The study findings have important implications for future health video campaigns. Whether related to the COVID-19 vaccine or other health crises such as preventative screening or future zoonotic diseases, understanding how perceptions of trust are impacted by the message source is critical.

Because the video from the United Nations was trusted the least, we would recommend using videos from domestic sources when trying to communicate with American college students on health-related issues. This finding also supports previous research that indicates people are more likely to trust sources closer to them in proximity (Malik et al., 2020).

Future research should use the same types of spokespersons included in this study but provide identical messages to determine which factors are most influential over trust: message source, speaker gender and profession, or message frames. It should also explore whether findings of this study are consistent with other American college students in different states and with international college students.

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**Improving Secondary School Students Mental Health: The Applicability of  
Sociohorticultural Reusable Learning Objects**

Emily G. Wintermute  
Texas A&M University  
600 John Kimbrough Blvd  
College Station, TX. 77843-2116  
emily.wintermute@tamu.edu

Dr. Robert Strong  
Texas A&M University

Keywords: youth, diffusion, agricultural education, agricultural extension

## **Introduction and Conceptual Framework**

Public health has become an increasingly important aspect of global consciousness (United Nations, 2015) in recent years due to the effects of high levels of poor nutrition, lack of physical activity, and lack of access to affordable, quality healthcare (World Health Organization, 2015). Mental health is an important subset of overall public health, with mental illness contributing to around 7.4% of disease globally (Becker & Kleinman, 2013). Further data shows that mental health issues contribute to almost one-third of adolescent diseases globally (Kutcher et al., 2013). Secondary students are particularly susceptible to mental health issues due to their stress-heavy lives and the likelihood of mental disorders arising during adolescence (Jorm et al., 2010). Outside of the secondary school population, the success of such programs conducted with different age populations has been widely utilized (Linden, 2015; Strong & Harder, 2011) especially in cooperative extension programming (Posadas et al., 2021).

Strong (2013) reported Reusable Learning Objects (RLOs) increased goat producer's knowledge. Post-secondary student learning from RLO dissemination was assessed by Roberts et al. (2016). However, there has been little research conducted on the potential benefits of creating reusable learning objects in the field of horticultural therapy or sociohorticulture for secondary school audiences. In order to conceptualize such implementation, Rogers' (2003) theory of diffusion was utilized to explain potential paths to adoption. To investigate the potential for adoption, the relative advantage, compatibility, complexity, trialability, and observability (Rogers, 2003) of reusable learning objects in sociohorticulture was assessed and examined for potential dissemination to secondary school teachers.

## **Purpose and Objectives**

The purpose was to explore sociohorticulturally based models of educational programming for secondary school students as a tool for improving student learning and mental health. Specifically,

1. Identify existing precedents and models for programming among other populations.
2. Investigate the potential effectiveness and application of reusable curriculum to improve secondary school teacher knowledge of sociohorticulture.

## **Methods**

Qualitative research methods were used to investigate teacher implementation of sociohorticulture concepts through reusable learning materials as a potential solution to mental health in secondary classrooms (Fraenkel et al., 2019). A qualitative systematic review was conducted of the existing body of knowledge (Lee et al., 2021). In order to better understand recent contributions to a greater understanding of the potential future of RLOs in secondary school settings, the review was limited to articles published in the last ten years. A comprehensive review of any existing literature was conducted to examine the forms of sociohorticultural programming utilized in other populations. Similarly, a literature review also included documents determining the merit of RLOs and whether they have been utilized in the field of sociohorticulture. Keywords included in the literature search included sociohorticulture, horticultural therapy, mental health, and horticultural programming. Systematic reviews more

precisely classify scientific innovations and lessen biases than an expert review (O'Hagan et al., 2018).

## **Results and Conclusions**

### ***Existing Precedents for Horticultural Programming***

Current data shows that while teachers are becoming more aware of the need for mental-health-related resources for secondary school students, they typically lack access to training, support, or professional expertise around the issue (Shelemy et al., 2019). Teachers indicate that despite this lack of support, they feel they can be a part of the solution to the global mental-health crisis (Froese-Germain & Riel, 2012) and highlight the need for practical, individualized solutions to student mental health. Documented benefits of horticultural programming that are particularly suited to classroom environments include increased focus in both general and attention deficit disorder (ADD) populations (Faber Taylor & Kuo, 2009), improvements in engagement (Yin et al., 2018), reduced cortisol and stress levels (Han et al., 2018), increased respect for nature and others (Acar & Torquati, 2015), increased environmental consciousness and sense of place (Gillis, 2015), and increased development in both social and cognitive skills (Acar & Torquati, 2015). A study conducted among elderly mentally ill populations in South Korea following a horticultural therapy program resulted in both reduced stress and improved physical function (Han et al., 2018). Horticultural programming enhanced youths' emotional well-being through improving pride, self-worth, coping skills, confidence, care for others and increased patience (Fontanier et al., 2019).

### ***RLOs Effectiveness to Teacher Learning***

Secondary school teachers are in an ideal position to support students first developing mental health problems. However, most resources for horticulture programming are used for youth in primary school settings and even fewer examples exist in the literature of such programs for secondary students (Rogers, 2018). However, teachers are often overburdened with responsibilities and have neither the access nor the training to address such issues on their own (Graham et al., 2011). The nature of RLOs makes them a logical fit to improve teacher understanding of student mental health. Previous study of the application of RLOs in primary education has resulted in increased levels of engagement and motivation in student learning (Cameron & Bennett, 2010). Similar results of improved learning, improved class engagement, and knowledge retention have also been found among undergraduate student populations (Onofrei & Ferry, 2020). However, studies from Greece show that barriers exist in the adoption of such technologies due to teacher apprehension and lack of knowledge (Poultsakis et al., 2021). There is limited research on the application of RLOs in secondary schools, specifically in the areas of sociohorticulture.

## **Recommendations**

Reusable learning materials could provide the necessary tools to improve student learning and mental health without placing the weight of program planning and implementation on agricultural teachers' shoulders. It is recommended that researchers and secondary school teachers collaborate to conduct further research on the potential applicability of pre-constructed sociohorticultural RLOs in classroom settings. Careful identification of related stakeholders, such as extension professionals, school administrators, and parents should be utilized in the future in order to create such programs for secondary students. Such an approach would allow a

greater understanding of the benefits of sociohorticultural RLOs and their potential impacts. While agricultural extension systems offer grade-level appropriate programming for younger children as well as for adults (Palmer & Strong, 2022), there is a lack of intentional programming for secondary students.

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**Supporting Youth Development through a Continuum Model**

Meikah Dado

Department of Agricultural Leadership, Education and Communications  
Borlaug Institute for International Agriculture  
Texas A&M University  
578 John Kimbrough Blvd. Suite 201, Office 215  
College Station, TX 77804  
[mdado@tamu.edu](mailto:mdado@tamu.edu)

Jack Elliot, Ph.D.

Department of Agricultural Leadership, Education and Communications  
Borlaug Institute for International Agriculture  
Texas A&M University

*Keywords:* Youth development, international development, Africa, continuum model, evaluation

## **Supporting Youth Development through a Continuum Model**

### **Introduction**

Youth in the African continent face challenges in finding sustainable and supportive careers. The sheer population of youth and lack of jobs makes it difficult for them to find suitable employment. In 2018, there were over 420 million youth between the ages of 15 and 35 years old and the number continues to climb (African Development Bank Group [AFBD], 2018). The majority of these youth are unemployed or underemployed as ten to 11 million youth come into the job market each year, but there are only around three million jobs created (AFBD, 2018). Agriculture is a leading industry in much of Africa and a source of immediate career opportunities for youth (Adenle et al., 2017; Haggblade et al., 2015)

Since the 1990s youth employment has been in conversation for many African organizations, such as African Union, African Development Bank, and national governments (Fox et al., 2016). There is the opportunity for youth to receive quality education to prepare them for careers in the agricultural sector. Projections suggest between 2010 and 2025, labor demand for non-food purchases will grow by nearly 140%, post-farm system jobs will grow by 110%, and production agriculture jobs will grow by 22% (Kabasa et al., 2015).

Numerous efforts have been made to address youth employment, however, most of the so-called solutions are pilots and small-scale donor-funded employment and training programs, which have not expanded and have little evidence on their effectiveness (Fox et al., 2016). While foreign aid has shown significant results on education and lifelong learning in primary schools, the evidence is not significant in secondary or tertiary education (Asongu & Tchamyou, 2019).

### **Purpose and Objectives**

The purpose of a continuum model is to provide a potential measurement tool for continuous evaluation of international development programs specific to youth and community development.

Therefore, the objectives of this model are to:

- 1) Examine how previous literature measured development success.
- 2) Construct a model based upon previous literature.
- 3) Make specific applications for the use of the continuum model.

### **Data Sources**

Through reviewing the literature on international development projects, specifically in education, it became evident there was a need for a thorough consistent model in youth development with specific indicators of success. Analyzing and combining the literature allowed for the creation of a continuum model of youth development with specific competencies and indicators of success.

Through the literature, there were consistent themes that were condensed to three overarching themes of the model including, 1) personal growth, 2) professional growth, and 3) community

growth (Adenle et al., 2017; Haggblade et al., 2015; Hastings & McElravy, 2020, Hastings et al., 2011, Minde et al., 2015; Muiya, 2014; Mwara, 2017; Rosekrans & Hwang, 2021; Teane, 2020; United Nations Economic Commission for Africa, 2017). Each theme has competencies that move an individual through the phases of the continuum starting at the awareness phase of the competency, interaction phase, and finally to complete mastery of the competency (Elliot, 2006). Within each competency, there are specific indicators of success that an individual has to achieve before moving to the next phase (Elliot, 2006).

Within personal growth, youth transition from awareness, interaction, and mastery through exemplifying competencies such as empathy, self-efficacy, responsibility, tenacity, and compatibility. The awareness indicators of success include identifying qualities, and connecting principles and values. The interaction indicators of success include assessing own qualities, sense of self-worth, acting appropriately, and team player. The mastery indicators of success include self-starter, active participation, and commitment.

Within professional growth, youth evolve through the continuum starting from awareness to interaction, and mastery through experiences such as education, entrepreneurship, and employment, and demonstrate effective communication and leadership skills. The awareness indicators of success include acquiring knowledge and identifying resources. The interaction indicators of success include using resources, conceptualizing ideas, adaptability, and thinking critically. The mastery indicators of success include leadership roles, active participation, and making effective decisions.

Within community growth, youth impact and influence involves agricultural sustainability, innovation, collaboration, relationships, and equity. The awareness indicators of success include access to knowledge and access to resources. The interaction indicators of success include active experimentation, innovative ideas, engaged individuals, and resource prioritization. The mastery indicators of success include equitable opportunities, proper management, and conflict resolution.

### **Conclusions**

As the population of youth continues to grow in the African continent, previous researchers have analyzed the need for youth development. Scholars suggest youth have an interest in sustainable careers but lack the resources to obtain careers (Haggblade et al., 2015; Hastings et al., 2011; Muiya, 2014; Mwara, 2017; Rosekrans & Hwang, 2021). The agricultural sector provides an immediate opportunity for youth and communities but is in need of quality education and skills sets (Adenle et al., 2017; Hastings et al., 2011; Hastings & McElravy 2020; Minde et al., 2015; Teane, 2020). Although each study was involved with youth development, each study varied on the model or method used to describe youth development and the success of each project. We conclude using a model to monitor and evaluate youth development projects could assist in determining the project's success and youth's development.

### **Application**

This model can be applied to school-based or community-based agricultural education development projects. For example, the International Agricultural Education Fellowship Program can use this model to estimate the success of the program through analyzing if the project meets the indicators for each competency, giving a sense of, if the youth and their communities are at the awareness, interaction, or mastery phase for their personal growth, professional growth, and community growth. This adds value to the monitoring and evaluation component, but also allows the program to be adaptable throughout its program cycle as this is a continuum, not an end-of-program assessment. In addition to agricultural education projects in the development sector, this model can be applied for other monitoring and evaluating projects that include youth and community development.

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*inclusive development.*

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# **Camaraderie, Culture, and Connection: A Photovoice of a Long-Term International Fellowship**

Jessica R. Spence

The Norman Borlaug Institute for International Agriculture and Development

AGSV Building, Suite 201, Office 215

578 John Kimbrough Blvd.

College Station, TX 77845, United States

[jessicarae2@tamu.edu](mailto:jessicarae2@tamu.edu)

Tobin Redwine

Vivayic Inc. and Texas A&M University

**Key Words:** Transformational learning, photovoice, fellowship, international agriculture, Ghana

## **Introduction & Literature Review**

There is much research previously conducted on the impact of study abroad as international experience, and its benefits and impacts on those that participate (Carlson & Burn, 1990; Dwyer & Peters, 2004; Hadis, 2005; McLeod, & Wainwright, 2009). However, much less is studied or known about the impacts on individuals who participate in international long-term fellowships. Long-term fellowships involve prolonged engagement within another country when compared to traditional study abroad programs. Additionally, fellowships typically involve individuals who have completed a degree, rather than a study abroad involving students. This study aims to examine fellowships as a form of international experiences.

## **Purpose and Objectives**

The purpose of this study is to understand the fellow experience through their perspective using data triangulation between photos, description, and focus group discussion. The objective was to develop a holistic and consensus understanding of the fellow-experience.

## **Methods**

This study utilized photovoice, in which participants observed themselves, their environment, issues, produced self-taken photographs that document their experience, and lastly, participants were observed through the photos they produced (Wang & Burris, 1999). Participants were assigned to take photos they felt represented their fellowship experience, as per Wang & Burris (1999).

A consensus of fellows completing a Borlaug Institute International Agricultural Education Fellowship Program (IAEFP) fellowship was the population for this study. Participants ( $n=9$ ) were 22 to 27 years old, and comprised of two males and seven females. Each has a minimum of a bachelor's degree.

We asked participants to take photos that represent their experience over a one-month period. Participants gathered at the end of the month for a two-hour focus group. We asked them to select 2-5 photos that best represented their experience, triumphs, struggles, etc. (Spence, 2020). Each participant explained what was in the photo, why they chose it, and how it articulated their experience. Discussion was framed by Wang and Burris' (1997) acronym, VOICE—voicing our individual and collective experience. After each participant shared, they engaged in group conversation about each others' photos and experience (Spence, 2020).

The focus group's transcript was analyzed using constant comparative methodology as per Glaser and Strauss' (1967) to assess individual stated thoughts or concepts, known as incidents (Spence, 2020). Through narrowing and comparing incidents themes developed.

## **Results and Conclusions**

This photovoice resulted in 10 themes that describe the IAEFP Fellowship experience after their first month within their communities. The themes were: Camaraderie, Struggles, Recognition of Empowered Women, Appreciation of Culture and History, Exploration, Finding Community, Personal Growth, Time in School & 4H Ghana, and Student Appreciation & Connection. To protect the identity of the participants, all results will be reported using pseudonyms.

Participants described *Camaraderie* as feeling safe, comfortable, and appreciative of one another. They detailed time spent together, appreciation for each other's vulnerability, and the ability to relate to each other. Eloise stated, “the [Fellows] make it a safe environment.”

The theme entitled *Struggles* articulated fellows experience with illness, personal struggles in adjusting, and struggles at school with teachers or current school norms. Regan said he is “still learning how to navigate classroom dynamics.”

*Recognition of Empowered Women* resulted as participants took photos of, described, and discussed female students in various situations, including acts of leadership, officer positions, and guidance of fellow students. Elaine said, “There is such a strong female leadership role here and someone is finally taking note of it.”

Participants described *Appreciation of Culture and History* through their photos and statements, including historical and religious sites, in addition to the culture within their communities. Liza described adjusting to Ghanaian culture by stating, “[I learned] about being patient because Ghanaians have a different way of living life—and it may seem chaotic—but it works out.”

The theme *Exploration* derived from participants' photos and conversation surrounding places they have visited or been to. Emma said, “I see connections where we are away from teaching and we are able to enjoy new places and new sceneries.”

*Finding Community* resulted as a theme as participants described the friends and connections they are making within their respective communities. Nancy said she picked a photo of her friend because, “Irene came to check on me, and everyone comes to check on me, so it is a big part of my experience.”

The *Personal Growth* theme derived from participants expressing incidents where they felt they had grown or learned something new. Leonard expressed how their experience has not just been about educating others, stating, “we are all learning more than we are teaching.”

Participants described a significant amount of spent *Time in School & 4H Ghana*, resulting in the theme. Regain said, “4H Ghana has been a big part of the experience,” he has had within the first month.

Lastly, *Student Appreciation & Connection* resulted from many participants' descriptions of their students. Participants expressed how their students were hardworking, excited, intelligent, and helpful. Leonard said his students, “teach [him] everyday,” and that, “a lot of [his experience] is student centered.”

### **Recommendations**

A significant aspect of the Photovoice is its aim of creating policy change (Wang & Burris, 1997). Therefore, our recommendations are directed towards creating policy change within IAEFP and similar organizations, and fellowships.

The theme *Struggles* details upsetting experiences of the participants. We recommend increased training in illness prevention of common local diseases. Additionally, we recommend to include increased details of emotional struggles of past fellows to better prepare future fellows for what they may endure.

Due to the *Appreciation of History and Culture* theme related to visited sites during training, we recommend increasing cultural site and historical training for IAEPF and recommend like-organizations include this aspect of preparation and training in their programming.

Many participants contributed to the theme *Recognition of Empowered Women* by noting the passionate participation and leadership of female students they work with. To better support fellows as they lead this population themselves, we recommend gender-specific training on empowerment of women.

We recommend international agricultural development stakeholders utilize photovoice as a means for reflective engagement with their teams and collaborators. Doing so will enhance perspectives and give voice to the community and culture in which groups operate.

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**Learning from the Experiences of Afghan Agricultural Scholars in the First Year of  
Graduate Studies Abroad**

Carmen N. Benson  
Doctoral Candidate  
Texas A&M University  
Department of Agricultural Leadership, Education, & Communications  
600 John Kimbrough Blvd.  
College Station, Texas 77840  
(706)627-5663  
cnbyce@tamu.edu

Jessica Garrels  
Michigan State University, USA

Razgul Dawar  
Rahman Safi International, Afghanistan

Manish Jain  
Rahman Safi International, Afghanistan

Kurt Richter, PhD  
Michigan State University, USA

Keywords: International Education, Scholarship, Refugee Education, Women in STEM

## **Introduction**

The mass exodus of families during the recent regime change sent 100,000 Afghan refugees into the US immigration system. Many are students, scholars, and researchers with career aspirations to contribute to agricultural development through science, innovation, and education. In response, the President's Office of Science, Technology and Policy initiated conversations with higher education institutions across the U.S. about welcoming Afghan refugees to our communities and campuses. The Association for Public and Land Grant Universities encourages universities to consider their capacity to host Afghan refugees in degree granting programs, as aligned to the service commitments of land grant universities (APLU et al., 2021).

Improved access and quality of education is correlated with transformative improvements in economic, health, and peace and stability outcomes (Bloom & Rosovsky, 2007; Milton & Barakat, 2016; USAID, 2018). Scholarship programs in the agricultural sciences are particularly important to build the capacity of national agricultural research systems to strengthen food systems through agricultural productivity-led growth and to generate innovations for more resilient food systems (IFPRI, 2021; Jayne et al., 2021). The Grain Research and Innovation Project (GRAIN), funded by the US Agency for International Development (USAID) and implemented by Michigan State University, was designed with the previous Afghan government to build public wheat research capacity in Afghanistan where wheat is a staple crop and central to food security and livelihoods (Mukhtarzai, et al., 2021 & Rashidi, 2021). To increase the number of highly trained agricultural researchers and to expand opportunities to women in research, GRAIN leads international scholarship programs for budding Afghan scientists to pursue graduate studies in wheat-related degrees in India.

## **Purpose and Objectives**

This mid-program internal evaluation aims to inform program improvements and contribute to learning around the implementation of international scholarship programs. This evaluation utilized Krumboltz's Social Learning Theory (1976) as the theoretical framework to explore the environmental conditions that impact student experiences, perceived and actual academic success, assimilation into their host universities, and career aspirations. Given the drastic change in programming in 2021 resulting from the political unrest and evacuation of program participants and their families, the results now inform practical recommendations to universities considering hosting displaced Afghan scholars and to more broadly inform the design of future programs. Though the larger study investigated all aspects of the scholarship program and measured emerging outcomes related to career aspirations and self-efficacy, this abstract focuses on the results most relevant to pre-program and early program preparation to identify practices and environmental factors that challenge or ease the transition for international students.

## **Methods**

This mixed-methods program evaluation was implemented in three phases, following approval from Michigan State University's Institutional Review Board (Fraenkel et al., 2019). The first phase was a desk study of student performance reports and meeting notes, allowing the team to target gaps in available information and to better prioritize needs for additional data collection.



The second phase was implemented through an online survey of all Scholars (n=18), with 52 items, primarily Likert-scale format, measuring six domains of Scholars' perception of program implementation and outcomes. A complementary survey sought reflections from the professors and advisors working closely with Scholars (n=21). For content validity, survey instruments were reviewed by Afghan subject matter experts, translated to Dari, and piloted internally (Dillman et al., 2014). The third phase was implemented through semi-structured key informant interviews with a sample of Scholars to more deeply explore themes that emerged from the quantitative survey results (Dooley, 2007).

## **Results**

Overall, survey and interview responses indicate high confidence in the perceived fairness and inclusivity of the scholarship recruitment and selection process. Even still, reflecting on the inclusivity of the application and selection process, there are two mentions of the need to more broadly distribute scholarship announcements outside of the city centers and to consider the limited access to internet among potential applicants in rural areas. In terms of initial arrival, or the "settling in" period, Scholars generally indicate satisfaction with the ease of contacting project staff, feeling safe in their dorm accommodations, and accessing medical facilities. Conversely, Scholars indicate challenges in accessing medical insurance and finding food that suits their taste preferences. In terms of academic preparedness at arrival, Scholars tend to indicate greater preparedness in professional experience and less preparedness in terms of writing skills, understanding of Indian academic culture, and test-taking. Reflecting on their first year of study, Scholars' Advisors/Leadership indicate perceived improvements in their ability to interact effectively with professors and in communicating in English, but indicate ongoing challenges related to arriving to class on time, performing to the standard on formal exams, and respecting local cultural norms. While the project and USAID strongly discourage Scholars from bringing accompanying dependents, Scholars point to several benefits to having families with them to include reduced anxiety and household and emotional support.

## **Implications and Recommendations**

The detailed results of this study, including the positive Scholar and Advisor perceptions, and the few points of more critical feedback, offer much learning to inform future USAID international scholarship programming. Perhaps most urgently, there is a growing need to support displaced Afghan students and professionals to continue their education in the US or third country outside of Afghanistan. The AIAEE community has a tremendous opportunity to host brilliant Afghan students. Drawing from the lessons learned and the findings of this study, which will be further explored in the oral presentation, universities can assess their capacity to host Afghan students and plan for programs and support systems necessary to ease students' transition. Facilitating a fair, merit-based selection process and working towards broad dissemination of recruitment materials that consider ethnic, gender, and geographic differences (i.e. in access to internet and social media) are important. Other recommendations include providing English language training, offering orientation to university culture and etiquette, leveraging community programs for accompanying families, and creating opportunities for community. Beyond the scope of findings in this evaluation, for the Afghan refugee community, institutions may also consider the

support services (i.e. emotional support, family support) that are important for students who were recently evacuated from their home country.

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# **Natural Disasters Mental-Health Impacts on Australian, Greek, and United States Farmers**

Karissa Palmer  
Texas A&M University  
600 John Kimbrough Blvd  
College Station, TX 77843-2116  
Email: [karissapalmer@tamu.edu](mailto:karissapalmer@tamu.edu)

Dr. Robert Strong  
Texas A&M University

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## **Introduction and Theoretical Framework**

Global climate change is characterized by changes in long-term weather patterns and has started showing its impacts worldwide (Mahato, 2014). A natural disaster is an event with catastrophic consequences including landslides, droughts, heat waves, floods, forest fires, tropical cyclones, or tsunamis (Sivakumar et al., 2005). The inconsistent climate, including drought, and financial hardships are two of the most cited sources on the mental health of farmers (Palmer & Strong, 2022). Extension systems should examine the professional competencies being developed in their staff to better address farmer needs in changing global conditions (Harder et al., 2013; Strong & Harder, 2011).

Ajzen and Fishbein's theory of reasoned action (1980) was used to understand the behavior of farmers who experienced a natural disaster. In understanding the theory of reasoned action, two things affect human behavior: attitude and subjective norms (Coppedge et al., 2013). Attitude refers to a positive or negative feeling about someone or something, and subjective norms are determined by the motivation to behave according to a person or group's beliefs.

## **Purpose and Objectives**

The purpose of this study was to explore how climate change induced natural disasters impact farmers' mental health. Specifically,

1. Identify studies from Australia that have discussed the mental health of farmers after a natural disaster.
2. Identify studies from Greece that have discussed the mental health of farmers after a natural disaster.
3. Identify studies from the United States that have discussed the mental health of farmers after a natural disaster.

## **Methods**

Comparative case studies were conducted through the use of key terms to determine the best cases to examine respective to the research objectives. Comparative case studies involve process orientations and seek to answer the process that connects x and y (Yin, 2018). The advantage of comparative case studies for researchers is the approach segregates phenomena from context enabling a study to explore contemporary and historical processes that have created a sense of shared place, purpose, or identity. Natural disaster occurrences were reviewed in Australia, Greece, and the United States to assess the mental health of farmers from each location. Literature demonstrates how natural weather-related disasters and climate change negatively impact farmers mental health from those geographical locations (Edwards et al., 2015; Padhy et al., 2015; Papanikolaou et al., 2011). Researchers from Texas A&M University assessed external, internal, and construct validity, and determined the study was well founded. Researchers analyzed the cases used in this study and determined the reliability. An embedded multiple-case design (Yin, 2003) was used to describe the behavior of farmers in several cases from three geographical locations.

## **Results**

### **Australia**

Recently observed climate change patterns have made Australian farmers more worried about the weather, resulting in an increase in depression and suicide (Ellis & Albrecht, 2017). In rural communities, suicides tend to occur more frequently because of droughts, particularly among male farmers and their families (Hanigan, 2012). Grape farmers drought induced suicides have increased and farmer numbers are not replenished (Bryant & Garnham, 2013). Farmers indicated mental health waiting times were lengthy, services are expensive, and local services were cut back including confusion about the available support (Polain et al., 2011). Service providers have been known to lack understanding of rural issues (Brumby et al., 2011). Cultural characteristics of farming promote behaviors such as ignoring mental health, preventing individuals from seeking help (Vayro et al., 2019). The SCARF (Suspect, Connect, Ask, Refer, Follow-Up) workshop was developed for Australian farming and rural communities and has indicated significant increase in suicide literacy and improved mental well-being at the 3-month follow-up (Perceval et al., 2019).

### **Greece**

The Mediterranean is a hot spot for the world's biodiversity, supplying clean water, food, flood protection, carbon storage, and recreation to people (Guilot & Cramer, 2016). Agriculture and tourism are important economic sources of Greece, and they may be strongly affected by changing climate conditions in the future (Giannakopoulos, 2011). Changes in the number of wet and dry spells, drought duration, and changes in growing season were investigated in this study. In the Mediterranean region it is projected that drought damages are going to increase in Greece (Naumann et al., 2021). Mental health care may be limited to those in rural communities due to the lack of facilities or socioeconomic status. Through the development of Mobile Mental Health Units (MMHUs) in Greece, rural areas can receive mental health care right from their homes (Peritogiannis et al., 2017). A study done on a rural area in Greece found psychological and physical health effects after wildfires destroyed land and increased financial difficulties (Papanikolaou et al., 2012).

### **The United States**

Twenty percent of the population in the United States is rural residents who have limited access to mental health services (Smalley et al., 2012). Mental health will become more prevalent as climate change continues to worsen existing droughts and exacerbate Montana farmers and ranchers mental health (Howard, 2020). A drought in two rural counties in California had impact on finances and property, which were associated with impacts on mental health (Barreau et al., 2015). There is a positive association with increased occupational psychological stress when drought occurs during growing season (Berman et al., 2021). Mental health resources for farmers are limited. Within the three months of landfall of Hurricane Irma, Floridian rural residents presented symptoms of anxiety, depression, and physical pain (Grattan et al., 2020). Debt-abolition or economic support for farmers may reduce the number of farmer suicides from climate change consequences (Padhy, 2015).

### **Recommendations**

Agricultural extension officers should expand their existing competencies to increase familiarity with the mental health impacts on farmers post natural weather-related disaster. Farmers' improved mental health will enhance resilient and sustainable agricultural systems and therefore, increase the likelihood rural communities can achieve food security. This study indicated natural disasters affect mental health and needs to be addressed by agricultural extension in order to improve the lives of farmers with mental health issues. Our findings provide evidence of a significant need for resources confronting the effects of natural weather-related disasters on farmers' mental health globally.

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**Competition for Water Resources: Experiences from Rural Households in Sub-Saharan Africa.**

**Rafael Quijada Landaverde**

Department of Agricultural Communication, Education and Leadership  
The Ohio State University  
208 Agricultural Administration Building  
2120 Fyffe Road, Columbus, Ohio, 43210  
Email: quijadalandaverde.1@buckeye.mail.edu

**Dr. Mary T. Rodriguez**

The Ohio State University

**Vinicius De Melo Justo**

The Ohio State University

**Dr. Amanda Robinson**

The Ohio State University

**Dr. Rebecca Giannotti**

The Ohio State University

Keywords: Africa, Agriculture, Water.

## **Introduction**

Communities around the world need water for multiple domestic, agricultural, and industrial uses. The distribution and competition for water for each use are strongly conditioned by the quality and quantity of water available in a locality (Maganga, Butterworth, & Moriarty, 2002). However, according to MacDonald (2019), the allocation of water resources in rural communities does not always respond to users' needs or to the conservation standards necessary to preserve the available water resources.

According to USAID (2017), competition for water use in Africa have generated major social and armed conflicts with severe consequences for economies, cultures, and natural resources. Sub-Saharan Africa is the region with the highest levels of water scarcity for all necessary uses for human development. According to a GIZ report (2018), approximately 42% of households do not receive enough water for domestic and hygiene uses. On the other hand, water scarcity is the leading cause of food losses in family agricultural production.

To address water scarcity, distribution, and conservation in any context and productive sector, it is necessary to understand local competing demands for water use (Ziolkowska & Peterson, 2016). This information will serve to promote practices of conservation and rational and sustainable use of water. In addition, it informs the implementation of water governance schemes and tools that have shown benefits in access to water and consequently in the elimination of extreme poverty in Sub-Saharan African countries (GIZ, 2018).

## **Purpose and Research Questions**

This study aimed to explore the competition for water among rural communities in Sub-Saharan Africa. The following research questions served to guide this study

1. How do rural households experience competition for water in Sub-Saharan Africa?
2. How do households make decisions for water allocation for various uses at the household level?
3. How does competition for water resources affect communities in Sub-Saharan Africa?

## **Methodology**

This research project is part of the Governance Research on Water System (GROWS) program aimed to design and disseminate innovative water governance models and tools to improve access in Uganda, Kenya, and Tanzania. The researchers selected five study sites and implemented 14 focus group discussions (FGD) with users and community leaders; and 50 semi-structured interviews (SI) with other stakeholders between 2018-2019. The interviews were conducted in English and the focus groups in the local language of each study site. In addition, a local research team was trained in each country to facilitate the FGDs (Olsen, 2011). Finally, the researchers translated and transcribed all SI and FGDs. Credibility and dependability were achieved through triangulation and peer debriefing (Creswell, 2015).

## **Results**

### **Competition for water**

According to users of water distribution systems, competition for resources has been steadily increasing due to “changes in the climate”, “more users in the same distribution system”, and “failures in the water supply systems”. In rural water distribution, a constant increase in demand without remodeling or expanding the system impacts the frequency and quantity of water users receive. One user commented: “The system is not enough to supply all the water that is required in the town”. Competing demands for water also depend on the characteristics of the economic sectors in the area. According to users, the productive sectors (i.e., agriculture, services) create scarcity issues for domestic and hygiene water needs.

### **Water allocation**

Households must efficiently distribute water amongst the many activities requiring it. Some users believe hygiene and domestic uses should be the first to be satisfied: “First we prioritize the house [domestic uses and hygiene] and then the water is used for other uses”. Others consider that agricultural and productive water demands have greater urgency because these sectors promote economic development and the potential improvement of water distribution systems.

While some families struggle to receive enough water to meet their basic needs, others have been seen to use water for businesses with less relevance to the health and well-being of human beings (i.e., car washes). In addition to water used for entrepreneurial gains, another competing sector is agriculture. This sector demands large amounts of water, creating conflict within the household, especially when making decisions about water distribution and use. For example, one of the participants mentioned: “Sometimes the water is not [even] enough for our house, and even then, we have to allocate a part to irrigate the crops”.

### **Impacts on community**

At the community level, competing water demands have consequences for the distribution system, users, and the water resources themselves. Competition for water compromises the efficiency of water distribution systems, promoting water waste and improper use of the system. One user mentioned: “Due to high competition for water, users do not respect distribution schedules. They [use] more water than they should”.

Another impact derived from the competition for water is the struggle community leaders and water boards face to implement governance schemes or tools for water access due to user dissatisfaction. At the individual level, households are forced to seek alternative sources of water, which in many cases have high costs, affecting the family’s wellbeing. In a home, the lack of water will force coping measures that compromise human health and well-being.

## **Conclusions and Recommendations**

In Sub-Saharan Africa, competition for water is constantly increasing due to population growth, climatic changes, and the accelerating deterioration of natural resources. This qualitative study shows competing demands for household use and productive sectors within the same communities in Uganda, Kenya, and Tanzania. These results are relevant to inform water

distribution systems and professionals about water service segmentation, increased water conservation, and community participation in system management. Further research on the effects of competition for water on household members is recommended. Historically, women have been the most affected since they responsible for getting water to meet household and family members' needs. In addition, distribution schemes that promote an equitable distribution between uses and households in rural communities should be explored and evaluated.

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# **Evaluating the Use and Potential for Broader Adoption of a Saliva-based Malaria Detection in Sub-Saharan Africa**

*Dr. John Diaz, Willis Ochieng, Colby Silvert, Cody Gusto*

## **Introduction**

Malaria is an urgent public health priority with nearly half of the world's population at risk. The World Health Organization (WHO) African Region continues to carry a disproportionately high share of the global malaria burden with 94% of all malaria cases and deaths in 2019 (WHO, 2021). Six countries in this region accounted for approximately half of all malaria deaths worldwide: Nigeria (23%), the Democratic Republic of the Congo (11%), United Republic of Tanzania (5%), Burkina Faso (4%), Mozambique (4%) and Niger (4% each) (WHO, 2021). Some population groups are at considerably higher risk of contracting malaria, and developing severe disease, than others. In 2019, there were 229 million malaria cases globally that led to 409,000 deaths. Of these deaths, 67% (274,000) were children under five years of age, which translates to child under five dying of malaria every two minutes (UNICEF, 2021).

Despite widespread malaria control efforts, residual malaria transmission continues to be observed (WHO, 2021), calling into question whether the global malaria elimination goals can be achieved. A large proportion of this residual malaria parasite transmission is due to low numbers of parasites that cannot be detected by available blood-based rapid diagnostic tests (RDTs) or microscopy. To address this need, the University of Florida's Emerging Pathogens Institute and the Center for Disease Control (CDC)'s Southeastern Regional Center of Excellence in Vector Borne Diseases took the lead to develop and implement a rapid saliva-based malaria detection system. The research centers recruited social scientists and extension specialists to design a study to assess the technology usability and opportunities for broader adoption to better understand its potential for combatting the growing malaria issues in Sub-Saharan Africa.

## **Theoretical Framework**

Promoting the diffusion of an innovation is challenging as the rate of adoption is heavily dependent on the existing social system. Innovators who understand how the characteristics of their innovations affect consumer receptivity and rate of adoption are better positioned to increase broader adoption across the social system (Pender, Murdaugh, & Parsons, 2006; Rogers, 1995). Considering the saliva-based malaria detection system's relative advantage, compatibility, complexity, trialability, and observability are therefore key to its use and broader adoption. It is also important to identify key actors or audience segments across the five levels of individual receptiveness (innovators, early adopters, early majority, late majority, and laggards) to develop a communication and/or education plan that increases the diffusion of positive sentiments through the social system. Developing an understanding of these two components will allow communication and education professional to tailor their promotional efforts to be in tune with the specific characteristics and needs of the potential adopters in the level that is being targeted.

## **Purpose and Objectives**

The purpose of this study was to systematically evaluate the usability and opportunities for broader adoption of a saliva-based malaria detection system. Objectives were to:

1. Determine the usability of the saliva-based detection system among key administrator groups.
2. Determine the opportunities and/or barriers towards the broader adoption of this new rapid, saliva-based technology.

### **Methods**

This study used a mixed methods approach to evaluate the usability and opportunities for broader adoption of the saliva-based malaria detection system in the Democratic Republic of the Congo (DRC). We used three data collection approaches to assess this paradigm including an observation checklist, survey, and interview protocol. 100 participants were included in this study representing 50 community health workers and 50 teachers in the DRC. Each participant was asked to collect a saliva sample, while being observed and assessed using the observation checklist. Of the observed participants, two focus groups were held per segment to better understand their experience administering the test in addition to gaining insights to better understanding how to communicate and diffuse the technology more broadly. Those that were not recruited for focus group participation were asked to complete a self-administered survey that centered on their perceptions on the technology and its efficacy.

Analysis was conducted within and across data collection modes to provide a holistic understanding of the study findings. Descriptive statistics were conducted on the observation protocol data and survey to describe the factors that the participants' feel are most integral for the broader adoption of the technology in addition to the participants successes and failures in collecting the saliva-based sample. Interview data was analyzed using thematic analysis (Creswell, 2003). The themes that emerge from the interviews were triangulated and compared with the observation and survey data.

### **Results and Conclusions**

Analysis of focus group interviews and surveys elucidate key innovation characteristics that must be considered and communicated to increase receptivity of the saliva-based malaria detection system across the local social systems of the DRC. Key informant interviews also outlined key actors in the DRC that represent stakeholders that reside on the initial rungs of the 5-levels of receptiveness to facilitate the positive communication and dissemination of ideas. Additionally, focus groups respondents provided perceptual barriers that may impede receptiveness including the perception of collecting saliva rather than blood, testing asymptomatic patients, and the cultural norms around spitting in a cup. Finally, focus group interviews and observation data allowed provided the team with insights for design modifications in addition to new ways to communicate system procedures.

### **Recommendations**

Those that are developing technologies and systems in the public health sphere should use a theory, such as diffusion of innovations theory, to guide communications of the innovation and

help to promote its adoption across social systems. Extension educators are well-positioned to meet this need for public health development efforts as they frequently conduct audience segmentation studies to tailor their programs. The results of these efforts will help extension educators and their public health collaborators tailor communication and education efforts based on the factors that are assessed as most influential for adoption. Finally, considerations should be made for using a change or diffusion theory in the development process as well. Taking into consideration innovation characteristics in the design process will help streamline the diffusion process and help to address some of the adoption needs prior to implementation (Pender, Murdaugh, & Parsons, 2006).

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# **Farmers' Occupational Stress and their Career Commitment During Pandemic**

## **Authors**

Carolyn Henzi, Ph.D. Candidate

The Pennsylvania State University

009 Ferguson Building

University Park, PA 16802

[cmh704@psu.edu](mailto:cmh704@psu.edu)

Suzanna Windon, Ph.D.

The Pennsylvania State University

**Keywords:** Stress, Occupational Stress, Career Commitment, Stress, Farmers, Pandemic

## **Introduction**

In 2020, the agricultural sector suffered a recession due to the COVID-19 pandemic, estimating that the global reduction in agricultural trade varied between 5-10 percent (Arita et al., 2021). The most impacted productions were meat and seafood, high-value agri-food, and non-food items (Arita et al., 2021). In critical times, career commitment is remain necessary to remaining in an agriculture pathway. A solid occupational commitment helps develop specialized skills to maintain the job over time, provides the power to persist, self-sacrifice for the job, and accommodate to hard times rather than withdraw from (Mrayyan & Al-Faouri, 2008). Amidst the pandemic, the agricultural sector worldwide has displayed a solid social and professional commitment to keep the business and people supplied. However, these tremendous efforts have added additional stress to farmers' lives (Chitra & Gopinath, 2021). Due to the evidence that farmers experience a higher rate of psychological distress, depression, and anxiety (Rudolphi et al., 2020; Yazd et al., 2019); this additional stress may impact the person itself and agriculture by increasing the rate of occupational accidents, in farming withdrawal, and in more extreme cases, farmer's suicide. Thus, this study aims to explore farmers' perceived stress and their career commitment to agriculture; we hypothesized that a higher rate of perceived stress could negatively affect farmers' occupational commitment. Previous studies showed that higher stress relates to lower career commitment, higher turnover intention, and poor performance (Asegid et al., 2014; Eskandari & Gorji, 2018).

## **Purpose and objectives**

The purpose of this pilot study is to explore perceived farmers' stress and their career commitment amidst the COVID-19 pandemic. Two research objectives guided this pilot study,

- (1) Describe farmers' perceived occupational (OS) stress and their career commitment (CC), and
- (2) Determine the relationship between farmers' career commitment and occupational stress.

## **Methodology**

This quantitative study utilized an online survey. We collected data using the Qualtrics software during Spring 2021 from Pennsylvania farmers. We sent an online survey to approximately 3000 Pennsylvania farm operators registered on the Penn State Extension database, mainly goat and sheep producers. The response rate was 10% ( $n=332$ ). The final data set comprised 186 responses after cleaning the data. We used the *Career Commitment Scale* (CC) and the *Occupational Stress Questionnaire* (OS). *Career Commitment Scale* is a 10-items scale adapted from OCQ Scale (Colarelli & Bishop, 1990) and was measured by a 5-point Likert scale from strongly disagree to strongly agree. Higher scores indicated high commitment. Perceived *Occupational Stress* was measured by using two scales developed by researchers, namely off-farm stress (5-items) (item examples: weather condition, market price) and on-farm stress (9-items) (item examples: machinery breakdown, managing farm employees). The occupational stress scale was measured using a 5-point Likert scale from never to always. Higher scores indicated high stress. The survey responses were analyzed using SPSS 26. We used descriptive statistics to describe farmers' occupational stress level and career commitment, followed by correlation analysis to determine the relationship between farmers' stress and career commitment.

## **Results**

For objective one, the overall mean score for occupational stress was 3.11 ( $SD = .65, n=186$ ). Mean score of on-farm stress was 3.07 ( $SD = .67, n=186$ ); off-farm stress was 3.18 ( $SD = .81, n=186$ ). The overall mean score for the career commitment scale was 4.05 ( $SD = .59, n = 186$ ).

Farmers' career commitment to agriculture was relatively high during the COVID-19. Research objective two described the relationship between farmers' career commitment and perceived occupational (on-farm and off-farm factors) stress. We found a significantly low positive correlation between career and on-farm stress ( $p = .151^*$ ). There is no significant correlation found between career commitment and off-farm stress.

### **Implications and Applications**

This pilot study contributed to the scientific literature related to occupational stress and career commitment. Our study does not support previous research on the relationship between stress and career commitment. Asegid et al. (2014), and Eskandari & Gorji (2018) found negative correlations between occupational stress and career commitment. Our study reported a low positive correlation between on-farm stress and career commitment. No significant relationship between off-farm stress and career commitment found. We assume that agriculture or farming differs from any other occupation in terms of the relationship between career commitment and stress. Future research should explore what other factors affect the relationship between farmers' stress and career commitment. The results of this study cannot be generalized to a larger population due to the nature of this pilot study and the utilization of a convenience sample approach. Penn State Extension professionals should use the results of this study and develop extension programs for farmers that help them manage stress on the farm.

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# **Students' Sentiments and Perception of Roundtable Classrooms in a Course of Agricultural Ethics**

## **Authors**

Dr. Carla Millares Forno, Dr. Sofia Brizuela Obando, Dr. Esteban Montenegro Montenegro

## **Introduction**

Instructors have the challenge of transferring knowledge in an engaging manner. Keeping students motivated, engaged, and most importantly, participating in class has become imperative in a world of instant gratification with increasing student attrition rates (Craig, 2018). Saunders and Kardia (2011) suggested that effective ongoing interaction or communication encourages students and instructors to feel safe and promotes participation among students (Abu et al., 2012). Lom (2012) suggested that the roundtable technique can be applied in several disciplines to achieve pedagogical goals. Parsons (2017) determined that students and instructors perceive that built learning spaces such as "roundtable classrooms" increase dialogue and student interaction. Using this method, instructors provide opportunities for the students to have a thoughtful and rich discussion instead of utilizing the typical teacher-centered approach of questioning students individually. Round table classrooms are described as "student-centered, interactive, engaging, egalitarian, Socratic, conducive to learning, comfortable, open, and relaxing, creating a useful small-group discussion (Parsons, 2016). Parsons (2016) also reported seeing students talking in groups after the class, affirming that these "informal" learning spaces helped enhance the students' dialogue outside the classroom.

## **Theoretical Framework**

The McClelland's Need for Achievement Theory was used as a theoretical framework for this study (McClelland, 1961). The theory proposes that every person has three primary needs:



achievement, affiliation, and power, and sustains that one of these needs is going to be the predominant (McClelland et al., 1984). Thus, students who enjoy a roundtable classroom setup will have one of the three main needs met, and consequently, their motivation levels and engagement in the class could increase.

## **Purpose**

This study aims to determine agricultural ethics students' perception and sentiments toward participating in a roundtable classroom setup compared to a traditional classroom setting.

## **Methodology**

Participants of this study consisted of 14 undergraduate students who took an Agricultural Ethics course. Participants received seven weeks of classes in a roundtable setting and seven weeks using a traditional format setting. In the roundtable setting, the instructor moved chairs to form a circle where all could see each other, and the instructor was set among the students. In the traditional classroom setting, students faced the front of the classroom, making the instructor the primary point of attention in the traditional class setting. After the fourteen weeks of classes, students were provided with a five-question assessment to determine their feelings and perceptions toward these two classrooms settings. Data was evaluated following data collection for this study using the package `tm` (Feinerer et al., 2008) written in R programming language version 4.1.0 (R Core Team, 2021). Sentiment analysis and descriptive statistics were used to draw conclusions and recommendations.

## **Results**

Results showed that students enjoyed the course more when using a roundtable setting than a traditional setting. In addition, students commented more on the positive characteristics of

a roundtable setting than in a traditional setting. In general, the negative comments were 50% less than the positive comments in both classroom settings.

Ninety percent of participants mentioned that they extremely enjoyed roundtable settings for the ethics course. However, they mentioned that they would prefer a traditional classroom setting for more theory-based classes and not as heavily focused on discussions, such as the ethics course that was used to compare the roundtable setting versus the traditional setting.

Some of the words that were mostly mentioned on a roundtable setup were: talk, discussion, easier, anyone, opinion, and everyone. Whereas in traditional classroom settings, – they mentioned traditional, normal, familiar, and formal.

## **Conclusions**

Undergraduate students prefer a roundtable classroom setting in classes that are heavily focused on discussion and conversation. In roundtable settings, participants feel equal and can all discuss important topics and feel comfortable with others. Participants described that the feeling of safety was imperative in a Socratic scenario among the students and the instructor. At the same time, they mentioned that they wanted to point their opinion, and it was easier to give it with that type of classroom setting. However, they also enjoyed a traditional classroom setting because it is the setting they are familiar with and the one they see in most of the classes. In addition, in a traditional classroom setting, the instructor can collaborate with the students, and the urge to being the main source of information is reduced. Participants also mentioned that when showing videos during the class, a traditional classroom setting was preferred.

McClelland and his collaborators mentioned that people feel motivated when their predominant needs: achievement, affiliation, and power, are fulfilled (McClelland et al., 1984). A roundtable setting provides students with the opportunity to achieve through their comments,

affiliate with their peers based on similar opinions, and show their power through sharing their point of view and feeling that their opinions matter. Therefore, this can be an effective way to motivate and engage students in the course and the topic.

## **Recommendations**

Courses that are heavily focused on discussion and personal opinion should explore the use of a roundtable setting in at least a couple of sessions to increase students' participation and motivation in the class.

It is recommended to develop more studies in different settings such as other courses and colleges to understand participants' preferences toward a roundtable setting.

Future studies should focus on evaluating students' perceptions of different classroom settings and correlate them with their personalities to understand the types of personalities that will enjoy a classroom setting.

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Aligning with African Agricultural Development Needs:  
The Case for School-Based Agricultural Education (SBAE)

Jack Elliot, Ph.D.

Borlaug Institute for International Agriculture and Development  
Texas A&M University  
578 John Kimbrough Blvd. Suite 201, Office 216  
College Station, TX 77804  
jelliot@tamu.edu

Haley Traini, Ph.D.

Oregon State University

Trent McKnight

AgriCorps

Jessica R. Spence

Borlaug Institute for International Agriculture and Development  
Texas A&M University

Meikah Dado

Borlaug Institute for International Agriculture and Development  
Texas A&M University

Key Words: Youth Education; Workforce; School-Based Agricultural Education,  
Transformation Model, International Development, Amplification, and Scaling Up

## Introduction

According to the United Nations Food and Agriculture Organization (2018), Africa's population stands at 1.2 billion and over half of its population is under the age of thirty, signifying that youth constitute most of the continent's population. The term "youth" is traditionally defined as a period of transition from childhood to adulthood. The African Youth Report (2009) categorized youth as people between 15 and 39 years of age. An obstacle facing the youth population is the inability of governments and policymakers to provide opportunities that help youth to have decent lives and contribute to the economic development of their countries. The World Bank (2017) estimates that Africa's population is growing faster than the jobs being created, and by 2035, about 350 million new jobs will be needed to meet the needs of its youth population. With the increasing population rate, there is a potential for agriculture to create employment, however, African youth in Sub-Saharan Africa, oftentimes, do not realize agriculture as a profitable opportunity for livelihood.

The involvement of youth in Africa's development cannot be overemphasized, and international development organizations are consciously choosing to include the young population in various development objectives. Investment in education and training is essential in building an educated and skilled workforce and to encourage innovation (McKnight, 2021). The United Nations Sustainable Development Goals (2021) have pledged to "Leave No One Behind" in the balance of economic, social, and environmental sustainability, where everyone is needed to achieve the 17 ambitious goals, particularly youths.

Agriculture, as a career option, is becoming viable to young people again in many places around the world as the reality of finding solutions to feeding our fast-growing planet is evident in many disciplines. Nonetheless, the concept of solving complex world problems requires the collaboration of governments and policymakers. Yet, in many parts of Africa, agriculture is still perceived only as backbreaking toil of the soil. As result of this poor perception, and historically driven education systems, agricultural initiatives receive little policy and government attention.

Sub-Saharan Africa is home to almost one billion people. By 2050, the population of the region is expected to double, and half will be under the age of 18. Known as the "youth bulge," this sudden population explosion will exacerbate challenges around youth employment and food security unless policymakers take decisive action, today. Agriculture is central to both the economic progress of the African region, and achievement of the Sustainable Development Goals (UN, 2021). Youth, as change agents, can be the catalysts within their communities to drive the uptake of improved agricultural innovations, leading to agricultural transformation. Youth, often viewed as only a source of labor inputs, are key change agents in the transfer of technology and science in school-based agricultural education (SBAE). Community members often improve their agricultural practices as they observe SBAE demonstrations and outcomes. Reaching youth where they live and learn, SBAE equips young people with the vocational and

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life skills necessary for agricultural progress (McKnight, 2021). SBAE is supported by evidence-based programmatic and advocacy efforts underway to advance SBAE in Africa. SBAE innovatively overlays the logic model framework (McNamara, 2019) within the diffusion of innovation model (Rogers, 2003).

### **Purpose and Objectives**

The purpose is to share the SBAE model in poster format.

The objectives are to highlight:

1. The layering of the logic model within the diffusion of innovation model,
2. The evidence-based support for the model,
3. SBAE as a viable solution to address food insecurity,
4. Illustrate the impact of increased trade opportunities in SBAE communities,
5. Highlight policy alignment and advocacy efforts to scale-up SBAE,
6. Feature the unique transfer of technology and science process.

### **Theoretical Framework**

Does deliberate learning with youth achieve concrete agricultural development outcomes and outputs that are sustainable within their communities? SBAE programs are increasingly adopted by international development organizations to create an enabling and experiential learning environment for youth to become community change agents. SBAE is a comprehensive youth education initiative centered on enhancing leadership skills; and improving agricultural knowledge, techniques, application, and production agriculture for junior and high school-aged youth with the goal of improving sustainable agricultural production, economic impact, and community livelihoods (Croom, 2008, Elliot, 2007, Elliot & Redwine, 2020, & McKnight, 2021). SBAE is guided by adopting the diffusion of innovation model (Rogers, 2003) and adapting it within a logic model framework (McNamara, 2019) to guide their evidence-based results. The poster will illustrate the relationships among these various components.

### **Conclusions**

The multidisciplinary SBAE approach is supported by over one-hundred years of proof-of-concept scholarship and a rigorous programmatic research team representing seven global universities and several NGOs (Croom, 2008, Elliot, 2007 & McKnight, 2021). The evidence generated uniquely allows for successful deliverables that are sustainable, scalable, and contemporary. Securing government support and commitment is critical to ensure successful implementation of the SBAE. The advocacy portion of this model, the Movement for SBAE, engages governments, policy makers, agriculture community leaders, and local authorities. These innovative activities are essential for sustained engagement and adoption of SBAE efforts. Scaling up efforts are proposed to be integrated and strategically timed to secure early and continued support of SBAE by local, national, and regional influencers, experts, and policymakers.

### **Implications**

The uniqueness of this model is its comprehensive understanding of the scaling-up process. The model is guided by adopting the diffusion of innovation model and adapting it within a logic model framework to guide their work which provides evidence-based results. This step is crucial as amplification occurs across the African continent. Results that are reliable, valid, and useable can change perceptions among decision-makers and increase levels of support for SBAE.



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**Taking You There Without Traveling: Virtual Exchange and Study Abroad**

Helen Yarenis, Study Abroad Coordinator of Marketing and Communications  
Perrotis College  
54 Marinou Antipa Street  
PO Box 600097, 57001 Thermi, Greece  
+03 2310-492892  
[hyaren@afs.edu.gr](mailto:hyaren@afs.edu.gr)

Eleni Kantyltzoglou, Administrative Coordinator, Perrotis College

Kim Dooley, Professor, Texas A&M University

**Keywords:** Virtual Exchange, Study Abroad, Innovation, Outreach

Consideration for a Poster Presentation: Innovative Models of Educational Programming

# **Taking You There Without Traveling: Virtual Exchange and Study Abroad**

## **Introduction and Review of the Literature**

Intercultural competence is considered an essential skill for an undergraduate education. Because international exchange and study abroad can present a challenge to many students, there is a need to develop and implement alternative means for incorporating international and cross-cultural experiences into the undergraduate classroom (Abrahamse et al., 2015). COVID had many impacts on educational delivery, with providers needing to develop alternative delivery approaches.

...[I]t was the onset of the COVID 19 in 2020 that drew the attention of university faculty and management to virtual exchange on a much larger scale. The lack of possibilities for study abroad during the pandemic led many to seriously consider how telecollaborative learning initiatives could be effectively integrated into curricula and internationalization strategies in order to give students an international learning experience without physical mobility. (O'Dowd, 2021, p. 7)

Virtual exchange is defined as “technology-enabled, sustained, people-to-people educational programs” (Helm, 2018, p. 4). The work across the Erasmus +virtual exchange impact report (European Commission, 2020) expanded the viewpoint:

By incorporating a combination of physical, blended and virtual forms of mobility into a curriculum, students have greater opportunities to integrate an international learning experience into their portfolio and have more opportunities to develop competences such as intercultural and linguistic skills, online collaboration, media and digital skills, online teamwork and networking, open mindedness, and critical thinking. (p. 6)

Perrotis College, located in Thessaloniki, Greece focuses on the latest developments and innovations in the agricultural technology sector. Perrotis offers undergraduate programs in International Business, Sustainable Agriculture and Management, Food Science and Technology, Environmental Science, and Digital Marketing. Perrotis College has cultivated international partnerships by providing educational services to students from US and EU universities.

## **Purpose and Objectives**

The purpose of this poster is to highlight innovative delivery approaches for virtual exchange and study abroad to provide broader student access to international agricultural enterprises. The objective was to demonstrate the impact of virtual study abroad programs as a viable option in higher education and extension training programs.

## **Methods**

Perrotis normally hosts students from the US on campus for semester-long coursework, faculty-led study abroad and work internships. Due to COVID regulations, this suddenly came to a halt. However, Perrotis responded with virtual experiences both for faculty-led study abroad and work internships. Four US universities participated last year with a total of 34 students from the US studying at Perrotis College.

Perrotis virtual programs mirrored the activities and excursions that would have happened on campus. This involved creating videos to be watched asynchronously, having tour guides give virtual tours synchronously, and professors providing engaging lectures over Zoom. Olive oil was shipped to the universities with a facilitated tasting experience and online cooking classes were held with students in their residence hall or homes. There were also online exchanges between Greek and American students.

Assignments included a cultural exchange project designed for students to think about their current culture and how to explain it to someone else. Students created infographics judged on content accuracy, relevancy of graphics, visual design, as well as how the overall design complements content, data visualization and main ideas with details. Other assignments included a structured worldview questionnaire and social identity mapping.

## **Results/Products**

Evidence of virtual program effectiveness was collected via feedback and program evaluations. One student from the faculty-led study abroad shared:

My favorite part of the virtual Greek study abroad course was the olive oil taste testing. Despite not being able to go to Greece, this was one of the ways that we were able to have an authentic Greek experience and it was something unique that I don't think I would ever have had the opportunity to have otherwise.

A study abroad coordinator from one of the universities also commented about the program.

An engaging, successful, educational, cultural, interactive, and enjoyable virtual course included topics on water buffalo production, beekeeping, agriculture cooperatives, climate change, livestock, olive oil tasting, Greek cooking and touring Thessaloniki and Athens was hosted by the remarkable partners at [College].

Intercultural learning was an important objective. Students took the Intercultural Development Inventory (IDI) before and after the course to see how their cultural understanding changed. Students also completed the course with daily reflections, intercultural activities and developed an interactive video that summarized their learning experiences.

The virtual work internship was also evaluated for effectiveness. Respondents valued their introduction to Greek culture and enjoyed learning about leadership, group dynamics, and workplace effectiveness. One intern indicated that they “really enjoyed the cooking and cultural

aspects” of the program. Another mentioned that “the workshops were fun and engaging and the game that we played was a great way to see how different departments in a company work.”

Students indicated that they received timely information from their supervisor and companies on the work-related projects. Students felt that the internship was relevant and meaningful for their career interests. It increased their skills and knowledge in performing activities and gave the opportunity to apply theoretical concepts to the actual work environment. One student expressed: “[It] was a great experience that many can learn from and be able to experience a different culture even without going to Greece.”

### **Recommendations and Educational Importance/Application**

Although we might prefer face-to-face interactions and cultural experiences, logistics, time, and money can limit participation. While the use of virtual study abroad and internships developed due to COVID, students indicated that they increased their intercultural skills, online collaboration/online teamwork, media and digital skills, and networking skills as a result (European Commission, 2020). The educational importance and application of using virtual teaching and learning could be expanded to include industry training and Extension workshops for authentic engagement to increase impact and reach without travel.

It is recommended that international educators coordinate efforts and resources to provide high quality virtual programming. Future studies could include using instruments and class assignments to determine specific knowledge and skills learned through virtual experiences and incorporate these as an enrichment to on campus instruction.

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**Exploring the Effectiveness of Online Webinars as a Tool for Increasing Extension Professionals' Confidence**

Olivia Caillouet  
University of Florida  
305 Rolfs Hall  
PO Box 110540  
Gainesville, FL 32611-0540  
olivia.caillouet@ufl.edu

Amy Harder  
University of Florida

Matt Bengé  
University of Florida

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# Exploring the Effectiveness of Online Webinars as a Tool for Increasing Extension Professionals' Confidence

## Introduction, Theoretical Framework, & Review of Literature

Cooperative Extension's mission is to help local communities solve problems by translating research into educational programs and learning activities for farmers, ranchers, communities, youth, and families throughout the nation (USDA NIFA, 2021). Identifying and understanding a community's needs is an important tenant for Extension professionals who provide educational programs and seek change within their communities (Harder et al., 2010). Extension professionals carry out this mission and are responsible for meeting the needs within their local communities (Rasmussen, 1989). Regardless of the Extension system, delivering the appropriate curriculum and training to clientele must be grounded on what their target audience lacks (Seever et al., 1997; Witkin & Altschuld, 1995); therefore, being able to conduct a needs assessment should be a priority in the program development process (Etling & Maloney, 1995).

Bandura's (1977) theory of self-efficacy guided the study. Bandura (1977) originally conceptualized the theory to explain how an individuals' efficacy expectations and outcome expectations influence "fearful and avoidant behavior" (p. 193). Our study was focused on efficacy expectations, defined as "the conviction that one can successfully execute the behavior required to produce the outcomes" (Bandura, 1977, p. 193). In our context, extension professionals who lack confidence or a sufficient perception of their own efficacy may avoid conducting methodologically sound needs assessments, much to the detriment of their stakeholders. Bandura (1977) theorized an individual could be treated to improve efficacy expectations and reduce avoidant behaviors. Previous studies found Extension professionals reported high levels of importance for needs assessment competencies (Umar et al., 2017) but low levels of current ability towards conducting needs assessment (Radhakrishna, 2000). Young et al. (2014) found that webinars were as effective as in-person trainings; however, it is unclear how much a webinar can impact extension professionals' confidence despite the increasing popularity of the format, particularly since the onset of the pandemic.

## Purpose and Objectives

The purpose of this exploratory study was to assess any changes in extension professionals' confidence in their ability to perform various needs assessment competencies resulting from attending at least one educational webinar. The objectives were to describe the professionals' self-confidence before the webinar(s), after the webinar(s), and the difference between the two conditions.

## Methods

A non-experimental design was used to address the study objectives. A survey instrument was distributed through Qualtrics in June 2021 to individuals ( $N = 126$ ) who had participated in at least one webinar of a three-part series focused on planning and conducting needs assessments. Participants represented two extension organizations in the southeast United States. The webinars can be described as Pre-Assessments, Working with Advisory Councils, and Tools and Techniques. The instrument asked respondents to report which webinar(s) they had attended. Based on that response, respondents were asked to rate their confidence for competency statements drawn from the organization's competency framework (Harder, 2015) and related to

the webinar(s) they attended. Respondents were asked to rate their confidence using the following options: 1 = *no confidence*, 2 = *low confidence*, 3 = *medium confidence*, and 4 = *high confidence*. The survey included three constructs used in this study: (a) pre-assessment skills, (b) advisory councils, and (c) tools and techniques. *Post hoc* reliability analyses were conducted on the six internal scales resulting in acceptable reliabilities ranging from .93 to .97. Despite using an initial invitation and two reminders, 39 responses were received and 23 responses (18.25%) were considered usable, as defined by responding to the items related to the variables of interest. The low response rate is a limitation of the study and was likely influenced by the timing of the evaluation during the Covid-19 pandemic.

### **Results and Conclusions**

Respondents tended to report greater levels of confidence across all three survey constructs after the webinars. For the pre-assessment skills construct, respondents ( $n = 23$ ) stated higher levels of confidence from before to after the webinar ( $M = 2.81, SD = .70$ ;  $M = 3.09, SD = .75$ ), although both were still considered medium confidence. Similarly, survey respondents ( $n = 11$ ) reported they felt medium confidence towards the advisory council construct before the webinar ( $M = 2.57, SD = .63$ ) and medium confidence after the webinar ( $M = 3.08, SD = .74$ ) but a mean increase occurred. The tools and techniques construct had the fewest number of survey respondents ( $n = 9$ ) who reported the smallest mean increase of all three constructs from before to after the webinar ( $M = 2.69, SD = .81$ ;  $M = 2.85, SD = .77$ ). Respondents had the greatest mean increase for the pre-assessment skill statement “I can identify major need areas and/or issues on which to focus the needs assessment.” Regarding the advisory councils construct items, respondents reported the greatest mean increase with the statement, “I can use the Hexagon tool.” Overall, participants’ self-confidence increased after attending one or more segments of the webinar series, which was interpreted as a positive impact on their efficacy expectations (Bandura, 1977).

### **Recommendations, Educational Importance, & Implications**

Effective program planning requires extension professionals to conduct needs assessments (Bayer et al., 2020; Benge & Warner, 2019). Using webinars to increase extension professionals’ confidence towards needs assessments may be an effective, low-cost approach for training. More research is needed to determine the specific strengths and weaknesses of webinars, specifically aimed at understanding extension professionals’ avoidant behaviors of critical job-related skills and ways to increase their efficacy expectations in those areas (Bandura, 1977). Researchers looking to replicate our exploratory work should consider using larger sample sizes and experimental designs to expand the generalizability and rigor of the research; we plan to do the same. The Covid-19 pandemic resulted in a greater need for online trainings and, as technology becomes more prevalent and globalization spreads, there is an increased need for documenting the professional development impacts of webinars (Paine, 2020).

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## **The Use of Data Visualization Dashboards to Communicate Program Outcomes and Impact**

**Ali, Amanda D.**

Data Scientist  
Rural Online Initiative  
Utah State University Extension  
4700 Old Main Hill  
Logan, Utah 84322  
[amanda.ali@usu.edu](mailto:amanda.ali@usu.edu)

**Hill, Paul A.**

Extension Professor and Program Director  
Rural Online Initiative  
Utah State University Extension

**Bria, Dominic C.**

Program Manager  
Rural Online Initiative  
Utah State University Extension

**Narine, Lendel K.**

Extension Assistant Professor and Evaluation Specialist  
Utah State University

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## **Introduction**

Evaluation is necessary to measure a program's worth or value (Rossi, 2004; Silliman et al., 2016). Many extension programs obtain funding from county, state, and/or federal/ministry agencies which require frequent reports on program performance and effectiveness (Lamm & Israel, 2013). For example, funding agencies such as the United States Economic Development Administration (EDA) reports on performance measures consistent with the Government Performance and Results Act (GPRA) of 1993 and its GPRA Modernization Act of 2010 amendment (EDA, n.d.). The GPRA mandates all agencies to collect, analyze, and report on their performance (EDA, n.d). Part of this procedure focuses on performance-budgeting measures as it relates to accountability (Ladewig, 1999). As such, funding agencies require all grantees to evaluate their programs. Often, reporting on program outcomes and impacts determine future funding requests. These reporting measures are critical to accountability and transparency within federally funded Cooperative Extension programs in the U.S., as well as agencies' distribution of funds (Ladewig, 1999). With increased competition for program funding, it is vital extension professionals effectively communicate their programs' outcomes and impact.

The GPRA's benchmarks of performance within the Cooperative Extension System relate to (a) relevance, (b) quality, and (c) accomplishments (Narine & Meier, 2019). Commonly, these metrics are obtained from logic models and robust evaluation plans; presented as tables, figures, and charts in annual reports. As more emphasis is placed on reporting and accountability related to federal budgets and use of public funds, communicating real-time data on program results can inform funders on program performance and outcomes in a timely manner. Real-time access to evaluation results by funders can improve program accountability and transparency.

## **Purpose and Objectives**

This study sought to create data dashboards for Utah State University Extension's Rural Online Initiative (ROI) program, adhering to GRPA's benchmarks of performance. Data dashboards were created for the ROI's Master Remote Work Professional (MRWP) certificate course. The objectives were to (a) create visually appealing dashboards that easily communicate statistical data, (b) use these dashboards to report on GPRA's benchmarks of performance for Extension, and (c) provide shareable real-time data on program outcomes to funding agencies.

## **Methods and Data Sources**

Data dashboards for the MRWP course were created in Zoho Analytics, a self-service business intelligence and data analytics software program that creates data visualizations. Evaluation data and course information is collected and recorded in Zoho's customer relationship management (CRM) system. Data collected from evaluation instruments, along with other manual entries, are stored in the CRM which automatically updates when new entries are added. Data collected from surveys pertaining to course demographics, enrollments, completion rates, and outcomes were all linked from Zoho CRM to Zoho Analytics. Once relevant information was visible in Zoho Analytics, widgets and interactive graphs and charts were created with dashboards; set to

automatically update with new course enrollments. With user interactions, data can be layered onto graphs and charts without complicating visual appeal or comprehension of large datasets. Survey data reflected all enrollments since the course's inception in October 2018 to present ( $N=1,634$ ). Basic demographic data included gender distribution, race distribution, gender distribution by ethnicity, age distribution by gender, and course completion by county. Outcome indicators were tailored to the program, and short, medium, and long-term outcomes focused on participants' intent to seek remote employment after completing the course, total number of job placements (broken down by each Utah region, year, month, and county; reductions in carbon emissions, increases in median income, and the county similarity of one job in rural to urban counties after adjusting for population size). These metrics were requested by the state funding agency as well as other stakeholders. Collectively, this information solidifies (a) the relevance and quality of the course as it presents meaningful data, and (b) accomplishments based on outcome data.

## **Results**

Two dashboards were developed upon collecting relevant data (guided by the course's evaluation plan). One was focused on demographic and enrollment data, while the other concentrated on course outcomes. Both dashboards are used internally by the ROI team and are published on the ROI's website (<https://extension.usu.edu/remoteworkcertificate/dashboards>) for public access. Each board is automatically updated, therefore real-time data is always available on the course's performance. This ensures updated information is shared with stakeholders on demand as they can check-in for accountability and transparency measures. Additionally, the dashboards allow for easy reporting for mid-year and year-end assessments.

## **Conclusions, Recommendations, and Implications**

Presenting results in an interactive and accessible format is highly useful as it captures ongoing data important for reporting purposes. While real-time dashboards require specialized skills and resources to execute, it effectively conveys the value of extension to stakeholders by demonstrating program relevance, quality, and accomplishments. It could also help extension professionals communicate the status of their programs with team members, helping to motivate and direct daily efforts. As with many program-evaluation processes in extension, the frequency of reporting outcomes and impact can become tedious. Thus, data dashboards are recommended as a long-term solution to evaluation reporting. While this study used a U.S.-based example, the concept can be applied to any extension program seeking to communicate program value to stakeholders. Each funding agency may have their own reporting requirements, similar to the GPRA. This means the frequency and type of information they require will vary. While this study used Zoho Analytics to create the dashboards, other visualization software such as Tableau Desktop, Microsoft Power BI Pro, Domo, Oracle Business Intelligence, or Amazon QuickSight can help provide meaningful results. As such, extension professionals should consider the use of data visualizations for program evaluation and reporting. The use of impactful visualizations could be an effective way to communicate real-time program outcomes and impact to funding agencies and stakeholders.

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## **Climate-based convergence strategies to facilitate sustainable learning among row crop producers and agricultural stakeholders**

Stewart, Hannah,<sup>1</sup> Michelle R. Worosz,<sup>1,3</sup> McKayla Robinette,<sup>1</sup> Brenda Ortiz,<sup>2,3,4</sup> Audrey Gamble,<sup>2,3,4</sup> Leah Duzy,<sup>5</sup> and Rishi Prasad,<sup>2,3,4</sup>

<sup>1</sup>Auburn University, Department of Agricultural Economics & Rural Sociology, 308A Comer Hall, Auburn, AL, USA, Has0053@auburn.edu

<sup>2</sup> Auburn University

<sup>3</sup> Alabama Agricultural Experiment Station

<sup>4</sup> Alabama Cooperative Extension Service

<sup>5</sup> Compliance Services International

Keywords: Convergence, Co-development, Engagement, Transdisciplinarity



## **Introduction and literature**

Natural Resources Conservation Services has identified soil, and water quality and supply, as priority conservation concerns as they are increasingly vulnerable to climate change (USDA NRCS, 2021). Despite the severity of soil and water degradation in the Southeast region of the US and internationally, producers are known to have political, social, and financial aversions to adopting sustainable practices designed to reduce on-farm climate hazards, creating knowledge-action gaps about technology transfer (Arshad, Kachele, Krupnik, et al., 2016; Crane, Roncoli, Hoogenboom, et al., 2011; Lacy, 2011). The Future of Farming project (FFP) is a 5-year transdisciplinary study designed to demonstrate the benefits and facilitate knowledge about climate smart technologies- implementing cover crops, variable rate irrigation, soil sensors, nutrient management practices- to bolster soil health and improve water and nutrient use efficiency in the face of climate change.

In the past five years the US National Science Foundation has emphasized convergence science to synergistically solve complicated, persistent issues that require the deep integration of multiple disciplines (Cannon, 2020; National Research Council, 2014; National Science Foundation, 2020). Convergence science is a diverse, and innovative research process used to solve “vexing” problems and inspire new scientific inquiry, innovation, and application. The interrelated concept of co-development of knowledge, a goal-oriented, dynamic learning strategy to transdisciplinary research, allows technical experts, who may greatly influence financial and agronomic decision making, to jointly develop interactive, pluralistic solutions to complex problems with producers as co-researchers (Hod & Ben-Zvi, 2018).

Co-development strategies encourage the reinterpretation of previously accumulated knowledge and experience which can build producer’s adaptive capacity and holistically address climate change. The implementation of engaging and collaborative structure into the FFP deepens the investment between Alabama extension and participants. This co-inquiry provides an essential link to producer-stakeholder partnership and informs the design, implementation, and critical reflection of productive, engaging learning strategies to climate-smart adoption which can be applied in international settings. Using a qualitative analysis, the governing concepts that influence agricultural education within the FFP can be identified and recommendations for the future of collaborative agricultural outreach strategies can be made.

## **Purpose and Objectives**

Identify strategies to maximize the effectiveness of FFP events and learning sites which promote discussion and engagement. Investigate ways to promote and improve collaborative international learning environments.

## **Methods and Data**

A total of 9 collaborative FFP planning meetings and 9 field days with stakeholders and producers have taken place between fall 2020 and spring 2021 (n=9.5 per event). FFP meetings have facilitated knowledge through engaging learning opportunities, on-farm visits, and peer-to-peer discussion about the project’s objectives, cover crop implementation, and variable rate irrigation. Individual interviews regarding project roles, team dynamics, and co-development of knowledge were conducted for all core FFP members to gauge collective project objectives and positionality (n= 7). All team meetings and interviews were video recorded, transcribed, and

thematically coded to identify influential concepts within the data about those project objectives, suggestions from the literature, and emergent ideas from the data using the QSR qualitative coding software NVivo (1.5.1). The data were analyzed using 3 word frequency queries and word clouds which visualize the top 100 repeating word generalizations in meeting and interview transcripts in the NVivo software.

## **Results and Conclusion**

The targeted transcripts for this analysis were intended to identify those vexing concepts with transdisciplinary research including challenges associated with establishing collective goals of the FFP and addressing potential challenges within innovative educational approaches. The first word cloud (A) included data from all meeting and interview transcripts mentioned by research extension professors and other FFP researchers coded as *challenges* AND *collaboration*. Of the 100 most frequently mentioned words, the top 5% were “farmers,” “change,” “crop,” “act,” and “activities.” The second word cloud (B) retrieved data from internal FFP interview transcripts coded as *challenges* AND *collaboration*. The top 5% of words encompassed were “farmers,” “change,” “crop,” “period,” and “activities.” The third word cloud (C) drew on the most frequently occurring words from all FFP field day planning meeting transcripts coded as *target goals*. The top 5% of words entailed “farmers,” “activities,” “act,” “crop,” and “changes.”

Word cloud (A) suggests that FFP members situate “farmers” as a forefront challenge. The high frequency of action-oriented words such as “change,” “act,” and “activity” in team transcripts explains the importance of implementing engaging processes with producers. Word cloud (B) specifically emphasized that team goals should actively serve farmers. In the second query, the concept of opportunity costs in association with time constraints was evident through the repetition of the awareness of time “period(s).” The literature and interview data suggested time constraints as a large barrier to active learning. The third word cloud (C) emphasized the need for dynamic planning and design for FFP field days and meetings.

The two major themes that have been generated by project data include the necessity for farmer-oriented learning opportunities and the facilitation of active learning and demonstration. In each word frequency query “farmers” was mentioned most. This word repetition directs the demand and desire of the FFP team to assist producers in combating agro-climate complications. The second reoccurring concept, active and engaging learning, was emphasized by the repetition of “activities” and “change[s].” Both concepts were present in the top 5% of repeating words for each word frequency query. This directly emphasizes the importance of planning and utilizing active, collaborative learning strategies which deviate from traditional top-down learning approaches.

## **Recommendations and Application**

The three separate word frequency queries suggest that action-oriented, engaging meetings which are directed toward and for farmers are necessary for successful collaboration and learning. Word frequency queries can inform transdisciplinary teams about those potential challenges associated with project direction and organization (NVivo, 2021). Though few studies have applied the use of word frequency queries for agricultural projects, it has high potential to

address those vexing complications with climate smart education. Thematic transcript analysis can prepare agricultural educators to build comprehensive planning for climate adaptive instruction both regionally and internationally.

## Title and References

### **Climate-based convergence strategies to facilitate sustainable learning among row crop producers and agricultural stakeholders**

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**Strategies to Advance Diversity, Equity, and Inclusion in International Agricultural and Extension Education Programs**

Scott D. Scheer, Ph.D.

Department of Agricultural Communication, Education, and Leadership

The Ohio State University

2120 Fyffe Road

Columbus, Ohio, USA 43210

[Scheer.9@osu.edu](mailto:Scheer.9@osu.edu)

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# **Strategies to Advance Diversity, Equity, and Inclusion in International Agricultural and Extension Education Programs**

## **Introduction**

Diversity, equity, and inclusion (DEI) are essential for international agricultural and extension education (AEE) programs throughout the world regardless of country, culture, or community. Awareness of clientele demographics help to make programs welcoming and enhance diversity and inclusion. To realize DEI in international AEE programs, not only must we focus on the target audience of the program, but also the planners of AEE programs. Program planners need to recognize their own potential biases and lack of awareness related to DEI. Hence, program efforts for international AEE must focus on both program participants and planners to advance DEI.

Throughout the world it is the exception to find homogenous communities void of diverse thought, culture, ethnicities, and identities. Most villages and locations have a unique blend of people and their own challenges and issues that are complex and influenced by historical forces which shape the present and future realities of those communities. The United States is an example of a nation rooted in colonialism and white supremacy that has resulted in ongoing struggles for racial equity and to make DEI an essential value of the U.S. Extension system. Every country and community across the globe have their own contextual systems and challenges to recognize and acknowledge as part of the process to achieve successful international AEE programs. For example, in Tanzania there are gender equality issues which have led to the adoption of policies such as the Women and Gender Development Policy in 2000. Although there are ongoing challenges to address Tanzanian gender inequality for bias in the workplace, dominant masculine culture, and fair compensation (Mutarubukwa & Mazana, 2017).

## **Purpose**

The purpose of this poster presentation is to provide strategies to advance DEI in international agricultural and extension education programs. A specific approach is shared that focuses on program planners and participants based on DEI research and theory.

## **Theoretical/Philosophical Themes**

The human development-ecoLogic model HD-ELM (Scheer, 2020) served as the theoretical framework for fostering DEI in international AEE programs. The HD-ELM features the components of a revised logic model, ecoLogic systems theory (i.e., inner, interaction, and outers systems), and human development. Program participants are part of the human development component and program planners are connected to all three components. The HD-ELM highlights the challenges to achieve effective international AEE programs due to community, contextual systems, and human development characteristics unique to program participants and those planning AEE programs.

Keep in mind that not only do past struggles frame the context for planning and implementing agricultural and extension education (AEE) programs, but the unique identities of program participants. Program participants might be Costa Rican smallholder maize farmers, youth in sub-Saharan Africa, Kenyan women village chicken producers, or U.S. urban roof-top gardeners. The demographics and individual identities of program clientele should be recognized and valued to connect and engage effectively. These demographics and identities may include socioeconomic status, sexual orientation, ethnicity, gender identity, location (rural, farm, urban, etc.), household size, age, disability status, and other areas. Remember the people who are served by AEE programs are why we exist and are the external focus of AEE efforts.

As Extension professionals, we plan, deliver, and evaluate our international AEE programs and bring our own views, perspectives, and biases in all that we do. Extension professionals or program planners are internal to AEE organizations. Without program planners being aware of how they may influence all

aspects of their programs, there will be intentional and unintentional consequences. For example, if a program planner has the assumption that the only men are target audience a program to improve water quality in rural Nicaragua, without including women and other village community members the program will not succeed. All village members play a role in preventing contamination of water wells from human waste, agricultural chemicals, and other contaminants. This is just one example, but as program planners we bring our unique selves, internal to our organizations, that can both hinder and advance international AEE programs.

## **Conclusions**

The main emphasis for making sure DEI is incorporated in all areas of international AEE is to focus on both realms of program planners and program participants. Program planners are internal to AEE systems and program participants are external. It is posited that attention to both realms must be consistently considered in all facets of AEE programs. It is the intersectional space between program planner and program participant domains required to achieve international AEE programs objectives.

## **Implications and Application**

Using this intersectional space (i.e., overlap of both program planners and participants) as a guide, international AEE organizations address DEI components and actions items simultaneously. These components may include the following:

- Recruit, reach minority groups for participation (program participant domain)
- Value clientele's identities and culture (program participant domain)
- Validate target audience's life experiences for a caring climate (program participant domain).
- Cultural competency training for AEE professionals (program planner domain)
- Use long-term strategies such as implicit bias education (program planner domain)
- Dialogue and discussion within AEE organizations to foster equity and inclusion (program planner domain)

By viewing the overlap domains of program planners (internal) and participants (external) together, rather than separate, program outcomes can be obtained.

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## **Benefits of International Extension Experiences: A Systematic Review of the Literature**

Benjamin B. Grove, Virginia Tech  
250 Drillfield Drive  
Hutcheson Hall, Room 106-2  
Blacksburg, VA 24061  
ben.grove@vt.edu

Sarah A. Bush, University of Idaho

Jeremy Elliott-Engel, University of Arizona

Keywords: internationalization, globalization, international, benefits, engagement



## **Introduction**

Internationalization of the U.S. Cooperative Extension System (CES) has been a topic of discussion for decades. Scholars have focused on topics such as influences of global trade on domestic agricultural economies, understanding the changing demographics of communities, and equipping extension professionals (EPs) with the skills needed to support their clientele in the face of increasing globalization. Ludwig and Barrick (1996) articulated an internationalized CES as: (1) clientele develop an understanding of global and national interdependence; (2) U.S. extension programs emphasize the impact of international economic forces on agricultural markets; (3) EPs incorporate global perspectives into current activities; (4) EPs acknowledge the connection between international issues and their mission; and (5) EP evaluation rewards international efforts.

Several initiatives have focused on CES internationalization. The National Association of State Universities and Land-Grant Colleges (NASULGC, 1997), through their Globalizing Agricultural Science and Education for Programs for America (GASEPA) agenda, called for increased competency for global awareness and competitiveness and access to ideas and technology, through understanding and promoting international trade and market growth, creating partnerships, and addressing global environmental concerns. Specifically, GASEPA promoted mutually beneficial relationships with international extension counterparts. NASULGC (2002) has argued, “the challenge for Extension is to provide leadership to demonstrate local implications and potential consequences of an interdependent world.” (p. 2). The United States Department of Agriculture (2003) created the National Initiative to International Extension including a series of conferences, grants, and communications aimed at mobilizing a network to enhance international and global engagement and programming. In 2007, the Joint Council of Extension Professionals held a series of workshops focused on internationalization. In 2019, the Extension Committee on Organization and Policy created a workgroup aimed at assisting international universities with outreach (Association of Public and Land-grant Universities, 2019).

One of the means for internationalizing CES is through international engagement of EPs. Several benefits to these engagements have been documented, including increased learning (Harder et al., 2011); skill development, reinvigoration, and increased global awareness and self-esteem (Place et al., 2000); belief in the value of international experiences (Crago, 1998; Place, 1998; Place et al., 2008); appreciation for diversity (Smith, 2008); changes in behavior and attitudes and added value of extension and international perspectives (Place et al., 2008). These benefits have been documented through individual studies, but little research has assessed how these benefits relate to other studies and experiences.

## **Purpose and Objectives**

The purpose of this study is to understand the rationale for internationalization of CES by exploring the perceived benefits of international extension experiences (IEE) by EPs as documented in the literature. In particular, we explored changes, if any, in reported benefits of international engagement over time as communicated in the literature.

## **Methods**

We conducted a systematic review of content published from 1980-2020 in five extension refereed journals: Journal of Agricultural Education, Journal of Agriculture Education and Extension, Journal of Extension (JOE), Journal of Human Sciences and Extension, and Journal of International Agricultural and Extension Education (JIAEE). To be included, articles had to include U.S. EPs who participated in an IEE and traveled abroad. Nineteen articles (JOE= 10; JIAEE=9) met the inclusion criteria and were coded. All articles were coded by three researchers using open coding and a predetermined codebook for previously identified benefits including: global perspective, personal belief in the value of international experiences, value of extension, learning and skill building, appreciation for diversity, benefits to domestic clientele, and self-esteem/reinvigoration. The three researchers then engaged in a collaborative meaning making discussion and analyzed intercoder reliability to be 91.98%.

## **Results**

From the journals, 138 articles had international perspectives, but only 19 included EPs with IEE who traveled abroad. Eight articles did not relay benefits from the IEE experience and primarily focused on international experiences and CES internationalization. Eleven articles talked about the benefits of IEE. Of the 19, only six explicitly evaluated the benefits of IEE by participants who had completed an IEE. Five articles included reflection by EPs, but not rigorous research. Based on the code book the benefits included: global perspective ( $n = 10$ ), learning and skill building ( $n = 10$ ), benefits to domestic clientele ( $n = 9$ ), appreciation for diversity ( $n = 6$ ), personal belief in value of international experiences ( $n = 6$ ), self-esteem/reinvigoration ( $n = 6$ ), and value of extension ( $n = 5$ ). Additional emerging codes included: networking, markets and trade, and problem solving. The benefits derived from IEE for EPs are not universal across the articles.

Empirical accounts of the benefits have come in waves, with a smattering of articles in the 1990's, a few more in the 2000s and 2010s. Consistency of benefits have not been reported across the small collection of literature. From 1991 to 2001 there was an emphasis on technical skills for markets, trade, policy, and technology. Around 2000, the focus shifted to interpersonal competency development (e.g. networking, diversity), problem solving for global issues, and increasing credibility with diverse U.S. audiences. The benefit consistent across decades was the benefit to U.S. domestic clientele.

## **Conclusions & Recommendations**

Our review confirms there has been sustained interest in IEE over the last several decades. The benefits of internationalization of CES are well documented, but evidence of IEE benefits is not in published literature. While anecdotal evidence from personal experiences may be useful in encouraging other EPs to consider IEE, the need for additional research exists. To bolster evidence for IEE as a component of internationalization, we recommend more rigorous evaluation of IEE by EPs who have undertaken IEEs. It will be important to have an updated taxonomy of the values of IEE as the benefits were not reported in consistent terms in the articles included in the review. Over the last four decades as global travel and communications have increased the frequency with which people interact internationally, there is an opportunity to update our shared understanding of the value of firsthand IEE as a component of

internationalization. We suggest a large-scale study of the perceived benefits of IEE by EPs to provide current information on this critical aspect of internationalization.

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**Climate Change: Relationship between Knowledge and Awareness in Students of an  
Agricultural University in Ecuador**

**Authors**

Pablo Lamiño Jaramillo

Gloria Cornejo Calvachi

Amy E. Boren Alpízar

Bernardo Trejos

**Keywords:** Education, Climate Change, College students, Ecuador.

## **Introduction**

Climate change is a well-recognized problem that has been investigated during the last century (Capstick et al.,2015) and uncontrolled anthropocentric activities are considered one of its principal causes (Harrington, 2021). This problem affects entire ecosystems, including humans, by reducing access to natural resources necessary for a decent life (Corvalán et al., 2005). As these problems have intensified, the need for a more comprehensive and explicit education on this topic has become stronger (Darling-Hammond, 2020).

It has been found that a climate literate person, understand the climate change principals, knows how to assess scientifically credible information, communicate, and make responsible decisions regarding actions that may affect climate change (Agboola & Emmanuel, 2016). According to Nath (2009), college education plays a special responsibility for instilling environmental awareness in university students . Based on the direct role that education plays in climate change awareness it is important to highlight and enhance universities' actions regarding climate change. Salehi, et al. (2016) found that by increasing the knowledge of university students on climate change issues, students would go from environmentally passive citizens to more environmentally responsible citizens.

In Ecuador, studies concerning climate change that encompass both awareness and knowledge are limited (Hernandez Escobar et al.,2018; Toulkeridis et al., 2020). Toulkeridis et al., (2020) found that 50% of Ecuadorian youth have no knowledge of what climate change is, highlighting the paucity of understanding regarding this topic. The purpose of this study is to examine the knowledge and awareness of students at an agricultural university towards climate change.

## **Purpose and Objectives**

This research seeks to understand the knowledge and awareness of university students from an agricultural university in Ecuador regarding climate change. The following objectives guided this research:

1. 1. Determine students' climate change awareness.
2. 2. Measure student's knowledge on climate change.
3. 3. Predict students' levels of assessed climate change knowledge from their levels of perceived knowledge.

### **Methodology**

For this non-probabilistic quantitative study, a convenience sample of 341 undergraduate students were recruited and asked to complete an online survey. The survey was divided into three sections: demographic information, climate change perceptions, and climate change knowledge. For climate change perceptions section, a Likert scale was used, incorporating six components: skepticism, perceived benefit, economics, environmentalism, perceived risk, and negative effects. Reliabilities for the construct ranged from .70 - .89. For the climate change knowledge section, true-false and multiple-choice questions were included for four dimensions: causes, effects, concepts, and relation to human beings.

Descriptive statistics were performed to detail the demographic characteristics of the groups. A simple linear regression was used to predict the assessed climate change knowledge (climate change true-false and multiple-choice statements) from perceptions of climate change (select how much you know about climate change).

### **Results**

In total, 341 students from agricultural majors participated in the study. Most participants in this study were female ( $n = 185$ ; 54.0%), and most of the students lived in urban areas ( $n =$

195; 57.18 %). For objective one, evaluate students' climate change perceptions level, on seven of the fifteen statements students marked of being aware of climate change issues in an 80%. The statement with the most agreement was that changes in the earth's surface, because of global warming, would increase the risk of extinction in animals (83.3%).

For objective 2, to measure students' knowledge, the students were evaluated on 15 items, each one consisting of "correct," "incorrect," and "I don't know" options. To determine frequency, responses were grouped into two categories: correct and incorrect; the answers "I don't know" were added to the incorrect group. The findings showed that the highest proportion of students have an average knowledge about climate change (n = 185; 54.25%), followed by low (n = 136; 39.88%) and high (n = 20; 5.86%). A simple linear regression was then performed to determine whether perceived knowledge can be predicted from the assessed knowledge. The results indicated that perceived knowledge is a statistically significant predictor of actual knowledge ( $\beta = 0.246$ ,  $P < 0.000$ ;  $F = 21.928$ ,  $P < 0.001$ , with  $R^2$  of 0.061).

### **Conclusions and Recommendations**

Even though perceived knowledge could predict 6 % of evaluated knowledge, there may be other variables such as educational background and level of awareness that could more readily predict evaluated knowledge. Future studies should consider adding these variables to better predict climate change knowledge.

In this study, 94.13% of the students had moderate to low climate change knowledge. Because college education plays a special responsibility for instilling environmental awareness in university students (Nath, 2009). It is important to invest in educational programs about climate change to increase awareness of the climate change and promote a more sustainable environmental attitude in students.

It is recommended to design a qualitative study of students' perception toward climate change to gain deeper insight into the issue. This study could also be replicated in different universities and countries to provide additional data on this topic.

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**The importance of organizational strengthening in a cocoa-based association in  
Guayas, Ecuador**

**Authors**

Pablo Lamiño Jaramillo

Renzo Ceme Vinces

Amy E. Boren Alpízar

Gabriela Suchiapa

**Keywords:** farmers' associations, agriculture, organizational strengthening

## **Introduction**

In Latin America, there are two common types of farmers' associations: the first model consists of farmers who organize and work together over the long term; the second model consists of farmers who work together for over the short term to achieve a specific objective and then return to their independent work (Mamani, 2017). The second model is more common in developing countries (Mamani, 2017).

Some factors that limit small farmers from working collaboratively over the long term are distrust and lack of knowledge concerning the process (Ferrando, 2014). Despite these limitations, many agricultural extension workers in Latin America promote the development of farmers' associations that work together over the long term (Enriquez, 2020; Mamani, 2017)

In the case of Ecuador, farmers' associations have shown weaknesses that inhibit their effectiveness (Espinoza et al., 2019). Organizational strengthening is a process that helps members evaluate organizational strengths and weaknesses to diagnose the causes and solutions of problems (Rudin, 2015). This research seeks to examine Ecuadorian farmers' thoughts about what characterizes a farmers' association before and after an organizational strengthening intervention.

## **Purpose and Objectives**

The purpose of this study was to understand cacao producers' perceptions of farmers' associations before and after an organizational strengthening intervention. To accomplish this goal, two research questions were examined:

1. 1. What is the perspective of farmers regarding a farmers' association?
1. 1. How do farmers perceive the association before and after organizational strengthening?

## **Methodology**

In this qualitative case study, members and non-members of a farmers' association in Ecuador received training organizational strengthening, strategic planning, and leadership skills. After building trust with the farmers, the lead researcher began to recruit informants for the research.

In total, 15 people participated in a one-on-one interview, nine men and six women. Twelve participants were association members and three were non-members. To build a baseline, the researchers divided the participants who were members of the association into three focus groups according to gender, women (n = 4), men 1 (n =4), men 2 (n = 4). Using data from the focus groups, researchers implemented a one-on-one interview with participants. To enhance the credibility of this study, multiple sources of data were used, such as researcher memos, photos, field notes, and a retrospective pre/post survey (Creswell & Creswell, 2018).

### **Results and Conclusions:**

Farmers were asked to describe what being associated means to them. Three themes emerged from the multiple sources of information: common goals, sharing core values, and advantages and disadvantages.

**Common goals:** Participants indicated that being associated with the association enhances production and trading of products at a fair price. During the one-on-one interviews, the participants defined association as a group of people who work for a common goal. The most recurrent answer to this question is that an association is made up of members who work collectively and want to improve their production and livelihoods. One member stated, "An association is a group of people that want to fight together as partners, to move forward, be heard and trained. To be associated means that you have a focus on where you want to go, to sell your product, and to be recognized by consumers."

At the end of the training, participants were asked to complete a retrospective pre/post assessment. Pre-training results indicated that 50% of participants knew very little about the definition of association, 40% had no knowledge, and 10% had knowledge but needed to learn more. Post-training, 67% of participants considered themselves knowledgeable and 33% indicated that they had the knowledge but needed to learn more.

**Sharing Core Values:** Members characterized the association as having values of loyalty, unity, sincerity, leadership, and integrity. Participants indicated that members must be firm in their objectives, participate in activities, seek improvements, and constantly train. One participant spoke of the association as, "Joint effort, inclusion, sincerity, participatory and seeking improvements for all."

Results of the retrospective pre/post instruments showed that before the training, 50% of the participants knew very little about the association's core values, 25% did not have the knowledge, 17% had knowledge, but they needed to learn more, and 8% were knowledgeable on the subject. After the training, 58% of the participants considered themselves knowledgeable, and 42% had knowledge, but still needed to learn more.

**Advantages and disadvantages:** This theme emerged from comparing the perspectives that associated and non-associated farmers have about what it means to be a member of the farmers' association. Associated farmers expressed more advantages of being associated than the non-associated farmers. One associated group member explained, "For me, the advantages of being associated are the experiences of acquiring knowledge, gaining entry to new places, and sharing the experience with other colleagues as well." A non-associated farmer was less enthusiastic, "I can't find an advantage to being associated. We have never belonged to an organization."

When asked to think of disadvantages to being part of the association,

participants who were not members listed several. One explained, "It's inconvenient when deciding, everyone has their own opinion on a different side, and no agreement is generated." In contrast, member explained the only disadvantage is when others don't participate. He mentioned, "When not all members come to meetings and trainings."

### **Conclusions and Recommendations**

Understanding the perspectives of both associated and non-associated farmers regarding farmers' associations can help those providing technical assistance to these farmers to address their concerns about joining an association more effectively. In Ecuador, farmers who are members of associations have been more successful in effecting positive change in their production and livelihoods. Conducting research into the views of farmers in communities with little or no participation of farmers could help associations to grow their membership and enhance their effectiveness.

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# Farmers' Motivation for Learning and Developing New Skills

## Authors

Suzanna Windon, Ph.D.

The Pennsylvania State University

209B Ferguson Building

University Park, PA 16802

[sxk75@psu.edu](mailto:sxk75@psu.edu)

Carolyn Henzi, Ph.D. Candidate

The Pennsylvania State University

**Keywords:** Motivation to learning and developing new skills, job motivation, self-leadership competencies, farmers.



## **Introduction**

The COVID-19 pandemic is a global health crisis that impacted the world economy. This impact is also being felt by the food and agriculture sector (OECD, 2020). Previous studies found that desire to be successful, increase profit, solve work-related problems, remain competitive, and have a better life relates to motivation to lifelong learning and development (Ma et al., 2020; Franz et al., 2009; Bhatta et al., 2019). Self-leadership is a process by which individuals manage their behaviors, influence their actions, and lead themselves to apply specific behavioral and cognitive strategies (Manz, 1986; Manz & Sims, 2001; Neck & Manz, 2010). Motives are why a person has to engage in certain activities or experiences and move in specific directions (He et al., 2006). A motivated person is considered a lifelong learner, and a lifelong learner is a motivated person (McCombs, 1991). Farmers' motivation has been one of the main influences to adopt a change such as technology, innovation, or attending an educational program to learn new production techniques (Bagozzi & Dholakia, 1999). Previous studies reported that farmers are highly motivated to learn new skills and desire to apply them in real-world situations (Franz et al., 2009; Bhatta et al., 2019). Despite prior studies reporting positive relationships between job motivation and participation in lifelong learning activities or training (Franz et al., 2009; Bhatta et al., 2019), there is a lack of research exploring the relationship between motivation for learning developing new skills and self-leadership and job motivation.

This study explored to what extent self-leadership competencies and job motivation can explain Pennsylvania farmers' motivation for learning and developing new skills. . This study hypothesized that self-leadership competencies and job motivation explain farmers' motivation for learning and developing new skills.

## **Purpose and objectives**

The purpose of this study is to investigate to what extent farmers' motivation for learning and developing new skills can be explained by farmers' self-leadership competencies and their job motivation. Two research objectives guided this study:

1. Describe the [state] farmers' motivation for learning and developing new skills, self-leadership competencies, and job motivation.
2. Describe to what extent self-leadership competencies and job motivation can explain farmers' motivation for learning and developing new skills.

### **Methodology**

A quantitative method was used for this study based on a descriptive-correlational research design. We used unrestricted, self-selected, and chain-referral sampling approaches (Fricker, 2008). Online data were collected during Fall 2019. We recruited farmers via the Penn State Extension website. A one-page press release was posted in a state-wide online newsletter webpage of counties Farm Bureau and the Penn State Extension social media page. After removing responses with missing data, the final data set included 59 out of 91 surveys. The instrumentation consisted of three scales ranked 1 (strongly disagree) to 5 (strongly agree). *Self-Leadership Competencies Scale* (11-items), *Job Motivation Scale* (3-items), and *Motivation for Learning and Developing New Skills Scale* (2-items). This study's dependent variable and two independent variables were treated as interval data. We used descriptive analysis to describe farmers' motivation for learning and developing new skills, self-leadership competencies, and job motivation, and regression analysis to describe to what extent self-leadership competencies and job motivation can explain farmers' motivation for learning and developing new skills. We utilized Davis's (1971) conventions to report the magnitude of the relationship between independent and dependent variables.

## Results

The overall mean score for self-leadership competencies was 3.93 ( $SD = .48$ ). Participants reported greater needs in the following: balancing personal and professional life, handling stress, quickly making decisions, and prioritizing tasks during the busy season. High proficiency was reported in applying their set values in the workplace, working independently, feeling self-confident, and achieving business goals. The overall mean score for job motivation was 4.72 ( $SD = .42$ ). Farmers reported being highly motivated by their jobs, feeling a sense of personal satisfaction when they do their job well; likewise, feeling proud by doing what they do and thinking in ways to do their job effectively. The overall mean score for farmers' motivation for learning and developing new skills was 4.33 ( $SD = .538$ ). Participants reported a high enjoyment of learning new things, no matter how relevant those are; likewise, they considered the challenges an opportunity to grow and learn rather than a barrier.

We found a significant positive association between farmers' motivation for learning and developing new skills and self-leadership skills ( $r = .39, p = .001$ ) and job motivation ( $r = .59, p < .001$ ). Multiple linear regression analysis showed that a significant proportion (40%) of the total variance in farmers' motivation for learning and developing new skills can be explained by the farmers' self-leadership and job motivation ( $R^2 = .40, F(2,56) = 18.7, p < .001, .$ ). It was found that self-leadership competencies significantly predicted farmers' motivation for learning and developing new skills ( $\beta = .26, p = .038$ ), as did job motivation ( $\beta = .67, p < .001$ ).

## Recommendations and Implications

This study makes a unique contribution to the leadership literature because limited research on the relationships between motivation for learning and developing new skills, self-leadership competencies, and job motivation was reported. We found that Pennsylvania farmers have high

motivation and enjoyment for learning and developing new skills and a positive attitude toward changes considering them as an opportunity to grow and learn rather than a difficulty. This study found that self-leadership competencies and job motivation are significant predictors of farmers' motivation for learning and developing new skills. Our findings support previous research that an individual's motivation for learning and development relates to self-leadership skills and job motivation (DiLiello & Houghton, 2006; Manz, 1986). Thus, this study provides evidence for Extension leadership educators to include self-leadership competencies and job motivation components into leadership training for farmers because it positively affects farmers' motivation for learning and developing new skills. Further research should explore the effect of demographic variables on farmers' motivation for learning and developing new skills.

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**Extension Internships Build Competencies for Career Readiness and Interest in Extension Careers: Implications for International Extension Education**

Joseph L. Donaldson, Ph.D.  
North Carolina State University

K.S.U. Jayaratne, Ph.D.  
North Carolina State University

Department of Agricultural and Human Sciences  
1 Lampe Drive, 202 Ricks Hall  
Campus Box 7607  
Raleigh, NC 27695-7607  
joseph\_donaldson@ncsu.edu

Keywords: Extension education, internships, career development

# Extension Internships Build Competencies for Career Readiness and Interest in Extension Careers

## Introduction

The United States is currently experiencing incongruity among workforce skills needed by college graduates, formal education curricula, and number of college graduates needed for certain jobs. In fact, 60,000 highly technical job openings in agriculture and related fields are expected annually, yet only 35,000 graduates are available (USDA, 2015). Furthermore, the *AGree Report on Food and Agricultural Education* stressed the need for workforce preparation to address impending challenges to food and agriculture (Mercier, 2015).

Research has shown that college graduates in food and agriculture need greater soft skills (often referred to as 21<sup>st</sup> century skills): critical thinking, strategic planning, teamwork, communication, leadership, problem solving, self-management, and professionalism (Crawford et al., 2011; Easterly, et al., 2017; National Research Council, 2012). Similarly, the National Association of Colleges and Employers (2019) have identified eight career readiness competencies: critical thinking/problem solving; oral/written communications; teamwork/collaboration; digital technology; leadership; professionalism/work ethic; career management; global/intercultural fluency; and adaptability. Unfortunately, college students often lack career development opportunities to develop or refine these competencies. Internships can be particularly helpful at supporting career self-management, or understanding career pathways, gathering information, and making career decisions (Jackson & Wilton, 2015). Internships, and research that expands our understanding of internships, are important for supporting students and professionals at all career levels (Stripling & Ricketts, 2016).

Extension internships are particularly useful in promoting Extension as a career and promoting a positive perception of Extension community engagement (Angima & Gaebel, 2018; Grotta & McGrath, 2013; Johnson, et al., 2019; Wilken, et al., 2008). In a survey of nine Extension interns, Muscio (2011) found that interns reported gaining considerable presentation/teaching skills as well technical skills.

## Purpose and Objectives

The NC State Extension Summer Internship Program seeks to engage college students to serve as Extension interns with these overall program goals: to gain knowledge of extension careers, to develop rich job experiences, and to help deliver extension programs. From 2019-2020, 85 interns were selected through an application process. The college majors represented included agricultural education, animal science, extension education, crop and soil science, and public health. Following a one-day orientation to Extension, interns worked in county Extension offices for 10 weeks. The purpose of this study was to evaluate the NC State Extension Summer Internship Program, and specific objectives were to:

1. Understand interns' perceptions of competencies for career readiness.
2. Understand interns' interest in an Extension career.

## Methods

A link to an online questionnaire was provided to Extension interns who were asked to complete the questionnaire during the last week of their 10-week internship. The questionnaire used an

open-ended question for respondents to provide examples of the one major competency they developed during their internship that would be useful to their future coursework and/or career. In addition, the questionnaire had retrospective post-then-pre questions for evaluating the interns' interest in an Extension career. A sample question was: "To what extent were you interested in pursuing a graduate degree in extension education?" and the scale was 1 (*not at all interested*), 2 (*slightly interested*), 3 (*moderately interested*), 4 (*very interested*), and 5 (*extremely interested*). Of the 85 interns, 63 interns completed the survey for a 74% response rate.

### Results

Regarding competencies for career readiness, interns were asked to select one of the eight competencies (critical thinking/problem solving, oral/written communications, teamwork/collaboration, digital technology, leadership, professionalism/work ethic, career management, global/intercultural fluency, or adaptability) and provide specific examples of how they developed that competency through their internship experience. Slightly more than one-third (36%) of interns selected oral/written communications followed by leadership (18%), teamwork/collaboration (14%), professionalism/work ethic (9%), adaptability (9%), and career management (5%). No interns selected critical thinking/problem solving, digital technology, and global/intercultural fluency. Interns reported a broad set of activities that help them develop their oral/written communications competency including: preparing newsletters; interacting with Extension colleagues, clients, and stakeholders outside of the office; addressing questions received via phone; building relationships and working with the general public; creating educational presentations for various programs.

The percentage of interns who were very or extremely interested in pursuing a career in Extension increased from 36% before the internship to 66% after the internship. The percentage of interns who were very or extremely interested in working in a rural North Carolina county increased from 49% before the internship to 67% after the internship. The percentage of interns who were very or extremely interested in pursuing a graduate degree in extension education increased from 30% before the internship to 40% after the internship (N=63).

### Recommendations and implications

The summer internship program produced a 30% increase in the percentage of interns very or extremely interested in pursuing an extension career. The program may be a viable career pathway for students, and future research should ascertain what proportion become Extension professionals. The acquired major competency reported by interns was oral/written communications, consistent with Muscio (2011). This finding is reflective of documented Extension job competencies (Laki, et al., 2014; Ohio State University Extension Competencies, 2015). Future interns should keep journals of their experiences. Perhaps the journals could use prompts such as "In what ways, if any, did you develop skills in digital technology this week during your internship?" The journals would be analyzed to determine the extent to which competencies were developed, if at all. The major implication of this study for international extension education is the proven success of using internships to create the extension career interests among the college students and develop needed soft skills essential for being successful in extension work.



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**Finding Disciplinary Literacy Capacities Between Cultures: An Inquiry in United States Secondary School Agriscience Education Classrooms Between English Language Learners and Native English Speakers**

Christopher A. Clemons, <https://orcid.org/0000-0001-9879-0888>

Assistant Professor of Agriscience Education in the Department of Curriculum and Teaching at Auburn University, Haley Center, Auburn, AL 36849, [cac0132@auburn.edu](mailto:cac0132@auburn.edu)

Thorsten Knappenberger, <https://orcid.org/0000-0002-0573-4586>

Associate Professor of Soil Physics in the Department of Crop, Soil, and Environmental Sciences at Auburn University

Jason McKibben, <https://orcid.org/0000-0003-2080-202X>

Assistant Professor of Agriscience Education in the Department of Curriculum and Teaching at Auburn University

James R. Lindner, <https://orcid.org/0000-0002-1448-3846>

Professor of Agriscience Education in the Department of Curriculum and Teaching at Auburn University

Keywords: Agriculture Education, English Language Learners, Instructional Delivery

## **Introduction**

The development of pedagogical instruction in Alabama Secondary School Based Agriculture Education (SBAE) classrooms have traditionally endeavored to establish disciplinary literacy with native English speakers through classroom instruction, modeled behavioral approach, and assessing student learning. This approach, while instructionally sound has often neglected the role of ELL students enrolled in SBAE course pathways. ELL students have not been widely studied in agriculture (Barajas et al., 2020) education programs. Aud et al. (2011) reported 21% of school age children speak a language other than English. This finding is staggering when considering less than “30% of mainstream teachers are prepared to serve [ELL] those students in their classes (Barajas et al., 2020, p. 143). The purpose of this study was to investigate practices SBAE teachers incorporate for developing agriculture literacy for ELL students.

The theoretical basis for this study was structured in Bandura’s (1997) model of triadic reciprocity. Bandura (1997) theorized the interconnectivity between the person (P), environment (E), and behavior (B) affecting the desired change. Vygotsky (1978) reported that learning occurs when the “student is interacting with people in their environment and in cooperation with their peers” (p. 90). Bandura’s model was used to frame this study because of the interconnectivity between the teacher modeling agricultural education concepts, the contextualization of curriculum in the classroom, and desired behavior (assessing learning) of the student. This assumption provided the basis for examining teacher-initiated instruction in SBAE teacher classrooms.

## **Purpose and Objectives**

The purpose of this qualitative study was to investigate pedagogical practices secondary SBAE teachers in Alabama incorporate within their lessons for developing agriculture literacy for ELL students. Three research questions guided this investigation: what pedagogical approaches are used for the development of agricultural literacy in ELL agriscience students, what types of instructional modeling do secondary school SBAE teachers implement for ELL student learning, and how do secondary school agriscience education teachers assess learning with ELL students?

## **Methods**

Participants for this pilot study were identified during instructional design professional development from Alabama SBAE teachers in July 2021. The population of potential participants consisted of 10 ( $N = 10$ ) SBAE teachers from Alabama. Participants were selected through a non-probability approach (Saunders, 2012), using criterion-based selection process. Participants taught in a SBAE program for at least three years, advisor of a local FFA, and had indicated their interest in learning varied pedagogical approaches for SBAE instruction. This type of purposive sampling technique is supported by Patton (2002) as a means for obtaining information-rich participants who possess a high degree of understanding and insight towards the research questions being asked. The research frame for this pilot study consisted of six participants ( $n = 6$ ) from Alabama. To address the three research questions Qualtrics was used to acquire participant responses. Grounded theory was used from the collected data to explain the significant findings. To support the trustworthiness of the data, participants represented a variety of educational backgrounds, professional experiences, relationship status’, years of employment, and age. Six structured interview questions were presented to the participants. The analysis of the

data was conducted by faculty members with previous SBAE experience. Grounded theory (Strauss & Corbin, 1998) served as the basis for this study. Researcher memos, discussions, and participant responses were transcribed and analyzed. To ensure credibility and trustworthiness member check was used with participants. Constant comparative method (Corbin & Strauss, 2008) was used to compare data against participants responses. Researchers' analysis of participant responses was evaluated and organized using each of the three research questions to produce 173 coded objects into four emerging themes.

### **Results**

Several characteristics emerged which helped define the means in which SBAE teachers instruct ELL students. Four emergent themes were developed. (1) *Contributions to the ELL learning environment*: SBAE teachers established early communication with ELL students to ascertain their background, experiences, and mutual agricultural interests. Technology use in the classroom was overwhelmingly positive regarding translation services, multi-language audio tracks, and the value ELL student families see in their children receiving SBAE education. (2) *SBAE pedagogical delivery methods*: As a result of early communications SBAE teachers developed individual accommodation plans for ELL students. These plans ranged from visual modeling of the concept(s) being taught, sharing unique aspects of teacher/student cultures, locating materials in the student's native language, strategic peer partnering, and utilizing graphs, pictures, digital media, and project-based instruction. (3) *Assessment practices for ELL students learning*: language barriers were not mentioned as a means of assessing student learning. Instead, teachers often found novel ways to assess ELL student learning. the use of multilingual rubrics was often used as an instructional scaffolding device. SBAE teachers assessed ELL student learning through demonstration, presentation, and completion of projects. (4) *Peer coaching for novice SBAE teachers*: veteran teachers often reported the complexity of the process and the importance of deconstructing the language barrier by discovering student learning styles, cultural representations, and shared agricultural experiences. SBAE teachers overwhelmingly indicated their desire to learn basic language skills in the ELL student native language, practice patience during instruction, but more importantly in the instruction development phase, and most importantly to show care and compassion for students.

### **Conclusions, Implications, and Recommendations**

Consistent with Bandura's (1997) model of triadic reciprocity, this pilot study reinforced the interconnectedness of ELL students learning environment, behavior, and change as conditions of the SBAE teacher and their approach for instruction ELL students. Our conclusions shared similarity with Vygotsky's (1978) premise that learning occurs when the "student is interacting with people in their environment and in cooperation with their peers" (p. 90). SBAE teachers' belief in the learning process and seeing students as "students" without a border to define them. Further analysis of the ELL agriculture student is needed to ascertain the unique dynamic between the teacher, student, and familiar value of education. The implications of this study illuminate the value of shared experiences and mutual educational importance defined the role of the teacher and the student in relationship to learning. Both teachers and ELL students were driven by a shared interest in agriculture and familiar support of agricultural education.

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**The Study Abroad Experiences of Secondary Agriculture, Food and Natural Resources  
Students**

Samantha J. Ludlam, Coopersville High School  
[sludam@capsk12.org](mailto:sludam@capsk12.org)  
10505 88th Avenue, Allendale, MI 49401

R. Bud McKendree, Michigan State University  
Aaron J. McKim, Michigan State University

*Keywords:* study abroad, international agriculture, secondary students, agricultural education

## **Introduction, Literature Review, and Theoretical Framework**

We explored the study abroad experiences of secondary school AFNR students in Michigan. Study abroad experiences are defined as “any number of arrangements by which students complete part of their degree program through educational activities outside the United States” (Purdue University, 2021, lines 2-3). During the 2018-19 academic year, 347,099 U.S. post-secondary students studied abroad, representing almost 250,000 more students than in 1994 (Martel et al., 2020). Although study abroad experiences and their benefits have been researched at the post-secondary level, there is a dearth of scholarship at the secondary school level. Within the context of Agriculture, Food and Natural Resources (AFNR) Education, there are even fewer studies examining this topic.

Existing scholarship on post-secondary study abroad programs have explored myriad outcomes, including *cross cultural awareness* (Lokkesmore et al., 2016), *cultural competency* (Bunch et al., 2018), *global competencies* (Sankey et al., 2014), and *global citizenship* (Berg & Schwander, 2019). Additional research illuminates employers view these experiences favorably when considering a resume (Harder et al., 2015). Other studies have examined the effect of study abroad on academic performance, with Xu et al. (2013) reporting positive correlations between study abroad and academic performance indicators (i.e., GPA, graduation rate, and graduation timeline). Existing scholarship illuminates the impact of study abroad experiences on post-secondary students; however, it is unclear if those positive impacts translate to experiences at the secondary school level. To investigate this important topic, we operationalized Astin’s (1991) input-environment-output (I-E-O) model as the theoretical framework. Students engaged in secondary school AFNR education study abroad experiences were viewed as the inputs and their study abroad experience was conceptualized as the environment.

### **Purpose and Objectives**

The purpose of this research was to explore the study abroad experiences of secondary school AFNR students as they relate to career determination, empathy, cultural awareness, and global competence. This was achieved via three distinct objectives: (a) describe the international travel experiences of former participants in a secondary school AFNR study abroad experience as well as a comparison group; (b) evaluate the outputs of former secondary school AFNR study abroad participants as well as a comparison group; and (c) describe the relationship between international travel experiences and educational outcomes.

### **Methods**

#### **Population, Sample, and Data Collection**



There were two samples from which data were collected for this research. The first was titled “AFNR Traveler Group” which included 37 past participants in an international study abroad experience, collected from agricultural educators in Michigan. In addition, a student comparison group consisting of 33 undergraduate students at Michigan State University without secondary school AFNR study abroad experiences was identified. To collect data, a Qualtrics survey was sent to the 70 potential respondents in February of 2021. After five weeks, 32 complete responses were received, for a 47.76% response rate; 16 respondents were in the AFNR traveler group (i.e., 42.34% group response rate) and 16 were in the student comparison group (48.48% group response rate).

### **Instrumentation and Data Analysis**

The survey included four outcome constructs: global competence, cultural awareness, empathy, and career determination. Items within the constructs were measured on a five-point scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). In addition, the survey included measures of international travel experiences and demographic information.

Face and content validity were evaluated by a panel of three professionals in agricultural education with expertise in social science research methods. To measure the reliability of the constructs, a *post-hoc* Chronbach’s Alpha was calculated for each construct. Data were retrieved from Qualtrics and analyzed using SPSS.

### **Results**

To address the first objective, we identified the number of countries each group had traveled to outside the United States. Although the means between the two groups were similar, the student comparison group ( $M = 3.50$ ;  $SD = 3.33$ ) had a slightly higher average than the AFNR Travelers group ( $M = 3.38$ ;  $SD = 1.59$ ).

For the second objective, we identified an average score for each outcome construct for the two groups. The average scores for global competence ( $M = 3.96$ ;  $SD = 0.39$ ) and cultural awareness ( $M = 4.52$ ;  $SD = 0.45$ ) were slightly higher for those students who studied abroad. Alternatively, the scores for empathy ( $M = 4.14$ ;  $SD = 0.39$ ) and career determination ( $M = 2.99$ ;  $SD = 0.81$ ) were higher in the student comparison group.

To accomplish objective three, a correlation between the number of countries visited and each outcome construct was calculated. No statistically significant correlations were identified; however, the highest correlation was identified between cultural awareness and the number of countries visited ( $r = .152$ ;  $p\text{-value} = .40$ ).

## **Recommendations**

There were several trends in the results worthy of further consideration. First, the group of AFNR travelers had traveled to fewer countries than the student comparison group. This result was not expected; however, we believe this was influenced by two individuals in the student comparison group who reported travelling to 11 countries.

When considering the utility of secondary AFNR study abroad experiences, the most promising findings were AFNR travelers reporting higher levels of global competency and cultural awareness. In total, these data suggest structured academic experiences offered for secondary AFNR students can result in increased educational outcomes like global competency and cultural awareness.

Examining the correlations identified in objective three, cultural awareness and number of countries visited yielded the strongest relationship. On the other hand, global competence and number of countries visited resulted in one of the weaker relationships. Neither correlation was statistically significant; therefore, potential conclusions are limited.

While the results of this research provide support for Astin's I-E-O model, there is still a lot of ambiguity regarding the environment of each study abroad experience. Qualitative research exploring the length and types of study abroad experiences in relation to educational outcomes will add to this line of inquiry. As additional recommendations, we encourage both students and teachers in secondary AFNR programs to explore opportunities for international study abroad focused on AFNR.

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**Teaching the Human Dimension in Agricultural and Natural Resources: Lessons Learned  
from a Field Experience Examining the Impact of Hurricane Michael**

Robert Strong  
600 John Kimbrough Blvd  
College Station, TX. 77843-2116  
[robert.strongjr@ag.tamu.edu](mailto:robert.strongjr@ag.tamu.edu)  
Texas A&M University

Amy Harder  
T. Grady Roberts  
University of Florida

Keywords: agricultural leadership, weather-related disasters, transformational learning

## **Introduction and Theoretical Framework**

Impacts from hurricanes can include widespread damage in agricultural organizations and communities, with recovery sometimes taking years (Grattan, 2020). As noted by the U.S. National Research Council (2006), responding to disasters takes an interdisciplinary approach, bridging social sciences and natural sciences. However, the NRC (2006) went on to say that social sciences often hold a marginal position when compared to natural sciences. By extension, it is reasonable to assume that many natural scientists may not have a good understanding of the social science aspects of an agricultural disaster.

Many of these natural scientists teach technical courses in universities and these universities are tasked with developing skilled graduates who will eventually work in these organizations and live in these communities (NRC, 2009). These graduates may very well be impacted by an agricultural disaster in their lifetime. However, it is hypothesized that technical courses taught by natural scientists may not adequately address human dimensions, especially as it relates to agricultural disasters.

A USDA Higher Education Challenge project was designed to provide contextualized professional development experiences for faculty and doctoral students in food, agriculture, natural resources, and related sciences by visiting communities and organizations to hear the first-hand stories of leaders impacted by Hurricane Michael. The field experience was facilitated using Mezirow's (2003) transformational learning theory, which involves critical reflection to recognize and analyze prior assumptions after the experience.

### **Purpose**

The purpose of this study was to examine the results of this experience. The objectives were to: (a) assess the extent which the stories from leaders impacted by a hurricane impacted participants' learning experience and (b) assess participants' intentions to use the experiences to teach leadership content in technical agricultural curricula.

### **Methodology**

An exploratory approach (Stebbins, 2001) was selected to investigate if and how hearing first-person accounts of the impacts of hurricanes impacted participants' attitudes about their professional development field experiences and their intentions to teach leadership content to their students. All participants ( $N = 12$ ) attended a field experience focused on Hurricane Michael in Florida. There were four females and eight males representing four universities in the southeast United States. Six participants were faculty, and six participants were graduate students. The cohorts included individuals with national origins in Costa Rica, Mexico, the United States, and Germany. The academic departments represented by the participants were crop, soil, and environmental sciences; agricultural education; forestry and environmental conservation; and animal science.

Data were collected in September 2021 during a formal group reflection session conducted at the conclusion of the field experience. A semi-structured interview guide was used, and interviews were audio recorded and transcribed with Otter.ai. The transcriptions were reviewed for accuracy and corrections were made by the researchers. Participants then received the opportunity to

member check the transcripts for accuracy, as recommended by Lincoln and Guba (1985). Some corrections were made.

The constant comparative method was applied to identify emerging themes from the data. One member of the research team took the lead in reading the transcripts initially. Then, that team member reviewed the transcripts a second time and began the coding process following Strauss and Corbin (1990). Identified themes were shared with the remaining research team for triangulation. All research team members were participant observers during the five-day field experience. One possible source of bias was the research team's predisposition to believing in the importance of leadership following a weather-related disaster, so quotes from the participants have been used to aid the reader in determining credibility.

### **Results and Conclusions**

The two dominant themes emerging from the research were impact on faculty and infusing leadership concepts in technical agricultural curricula. Due to space limitations, a summary of results is presented.

#### *Impact on Faculty*

R4 explained, "I was making an effort to separate the part that was hitting my soul, versus my mind. I am going to take to my class how the experience affected me." R5 shared,

I've learned a lot more compassion and empathy just hearing these people's stories. One of the women there, she lost her husband, so he was one of the 26 people that lost their life and knowing that when you see these numbers, there are people behind these numbers that are directly impacted."

R1 described,

I now have a connection to it and just like with any kind of learning if you have a past experience to be able to connect to the new information being taught that connection and then engraving of the information is that much stronger.

#### *Leadership*

R6 shared,

When I was looking at leadership, kind of just humanized leadership I think it's this grandiose thing like get to be this person or this credential to be a leader. I would really want to emphasize that in the classroom.

R9 reported,

Students need to be prepared for a response from the people that they're trying to help, that it's affected heavily affected by how they are feeling and their emotional state and in their mental health at that particular time. So, I think they that needs to be taken into consideration all across the board.

Interacting directly with leaders personally and professionally impacted by a hurricane led participants to have greater empathy, more passion, and an improved ability to teach the content to their students because of the field experience. The transformational experience (Mezirow,

2003) provided participants an opportunity to step outside their comfort zone, reflect on the experience, and develop contextual examples of their science to better develop agricultural leadership competencies (Strong et al., 2013) in their students.

### **Recommendations/Educational Importance/Impact on Profession**

Transformational learning experiences can enhance individuals' understanding of contextual issues. Creating opportunities for current and future faculty to engage off-campus and in communities is recommended to improve instruction related to real-world problems, like hurricanes. Instructors' ability to develop students' understanding of the human dimension of technical disciplines is crucial to translating science that impacts the next generation of leaders and current stakeholders.

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# Exploring the Influence of International Scholars on Social Media Engagement across Platforms

[Oral Presentation Submission]

Allison R. Fortner  
University of Georgia  
[afortner@uga.edu](mailto:afortner@uga.edu)  
405 College Station Road, Four Towers 209  
Athens, GA, 30602, USA

Catherine E. Sanders  
University of Georgia

Alexa J. Lamm  
University of Georgia

**Keywords:** social media; source credibility; international scholars; Twitter engagement; Instagram engagement



## **Introduction and Theoretical Framework**

The internationalization of higher education has changed academic environments, often through increasing international scholars' numbers within an institution (Balasooriya et al., 2014). International scholars, broadly defined as those "not born in and/or do not have their first degree from the postsecondary institution in the country where they have their primary academic appointment" (Altbach & Yudkevich, 2017, p. 3), fill gaps in research and teaching and play a role in the global rankings of universities (Altbach & Yudkevich, 2017). However, there has been little research to examine the influence of international scholars in university communications.

Social media has aided university extension providers in connecting with colleagues and clients (Kamruzzaman et al., 2018). Social media has additionally been identified as a tool for transferring scientific knowledge and experiences between farmers (Mills et al., 2019) and building social networks for agricultural research centers (Aguilar-Gallegos et al., 2021). While broadly available and frequently used in farmers' households, social media's use as a source of agricultural knowledge is low in some areas (Moonsammy & Moonsammy, 2021) and requires additional research for extension practitioners to use the communication medium to its fullest potential. Within an international context, academics wanting to effectively communicate their scholarship to an international audience can leverage source credibility of international scholars to increase the dissemination of agricultural and extension-based research.

Source credibility theory says a source's perceived trustworthiness and expertise influence a message recipient's perception of that source's credibility (Pornpitakpan, 2004). This credibility can vary based on the elements emphasized and the audience to which the message is being delivered (Bigham et al., 2019; [Author], Year). Demographic and authoritative characteristics of a source, as well as their own characteristics and homogeneity to the source (Bubela et al., 2010), play a role in a recipient's perception of a source's credibility (Han, 2018; Shariff et al., 2016). However, little research exists about public stakeholders' perception of international scholars' source credibility when receiving university research information over social media.

## **Purpose and Objectives**

The purpose of this study was to explore the influence of international scholars' perceived source credibility on university social media communication. Two research objectives guided the study: 1) Describe the impact of international scholars on engagement with university science communication on Twitter and Instagram; 2) Compare level of engagement between Twitter and Instagram when highlighting international scholars.

## **Methods**

This study used a quasi-experimental design to create platform-appropriate posts on Instagram and Twitter highlighting research from a university's college of agricultural and environmental sciences. To create posts, researchers selected peer-reviewed journal articles authored by two or more university scientists diverse in demographic characteristics and research concentrations. From November 1, 2020, to May 1, 2021, researchers published press releases about articles through the college's online newswire. During the week following publication,

researchers used HootSuite (Hootsuite, Inc., Vancouver, Canada) to schedule Twitter and Instagram posts featuring photos of scientists from the press releases. Separate Twitter and Instagram graphics were created for each scientist.

Scientists were categorized as either international or domestic scholars, with a total of 19 international and 13 domestic scholars. Social media engagement metrics were used to describe differences in emphasized elements of source credibility. Engagements are the measurable responses consumers have with content on social media platforms including reactions, comments, and shares (Barger et al., 2016). Engagement rate was calculated using impressions, the number of times a post appears on screen (Facebook, Inc., n.d). Engagement rates and impressions were obtained through Twitter Analytics (Twitter Inc., San Francisco, California) and Instagram Insights (Facebook, Inc., Menlo Park, California). Data were analyzed using descriptive statistics through SPSS 27.

## **Results and Conclusions**

The mean number of engagements with Instagram posts from domestic scholars ( $M = 17.62$ ;  $SD = 4.234$ ) was lower than that of international scholars ( $M = 22.00$ ;  $SD = 8.73$ ). The number of Instagram post impressions received by domestic scholars ( $M = 156.08$ ;  $SD = 13.14$ ) was also lower than the international scholars' impressions ( $M = 165.05$ ;  $SD = 25.42$ ). International scholars garnered a higher engagement rate by impressions on Instagram ( $M = 13.04\%$ ;  $SD = 3.91\%$ ) than domestic scholars ( $M = 11.31\%$ ;  $SD = 2.68\%$ ).

On Twitter, domestic scholars had higher mean engagements ( $M = 38.00$ ;  $SD = 27.83$ ) than international scholars ( $M = 34.11$ ;  $SD = 20.53$ ). Conversely, domestic scholars had fewer mean impressions ( $M = 902.15$ ;  $SD = 635.50$ ) than international scholars ( $M = 921.47$ ;  $SD = 476.269$ ). However, the domestic scholars received a higher mean engagement rate by impressions ( $M = 4.44\%$ ;  $SD = 1.25\%$ ) than that of international scholars ( $M = 3.85\%$ ;  $SD = 1.50\%$ ).

International and domestic scholars garnered higher engagements and impressions on Twitter than on Instagram, but engagement rate by impressions for international scholars was lower on Twitter. On Instagram, posts featuring international scholars had higher engagement rates by impressions than those featuring domestic scholars. However, the opposite was true for Twitter.

## **Recommendations**

As an emphasized element of source credibility, a university scientist's perceived country of origin may play a role in audience engagement with social media content. Though engagement cannot be directly correlated with perceived credibility, the exploratory results of this study suggest Instagram audiences are more likely to engage with content featuring international scholars than Twitter audiences, indicating social media channel used may impact engagement with specific content. To exemplify the global nature of their work and increase credibility, extension professionals may benefit from featuring international scholars prominently when communicating on Instagram rather than on Twitter.

Extension professionals should use this knowledge of varied audiences (Bigham et al., 2019; [Author], Year) to their advantage when crafting social media messages with international scholars, especially as they disseminate information to audiences around the world. Extension

professionals should also test the social media platforms most popular with their own audiences because social media use and accessibility varies globally (Moonsammy & Moonsammy, 2021). To build upon these findings, future studies could create messaging specifically targeted at farmers to determine if their level of engagement with international scholars differs from public-facing messages.

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## **Virtual Reality Diffusion in Agricultural Institutions: Addressing COVID-19 Instructional Challenges**

John Mark Palmer III  
600 John Kimbrough Blvd  
College Station, TX 77843  
Texas A&M University  
[jmpalmer@tamu.edu](mailto:jmpalmer@tamu.edu)

Dr. Robert Strong  
Texas A&M University

Keywords: agricultural education, experiential learning, gamification, eLearning, higher education

## **Introduction and Theoretical Framework**

The COVID-19 pandemic created the largest digital intervention of educational systems in human history (Pokhrel & Chhetri, 2021). Virtual reality technologies are examples of digital instructional tools that educators primarily use for virtual training or immersive curricular experiences (Kavanagh et al., 2017). Virtual reality can provide many opportunities for education outside of the classroom, as Ahir et al. (2020) determined that virtual reality technology can be applied as a means for learning in sports and military-based training exercises. De Ponti et al. (2020) set out to understand medical students' perceptions of using virtual reality and determined that 84% of their sample considered using virtual reality in the future for their medical training. As the literature indicates, there is a prevalence of virtual reality technologies in training-based practices, however, it also indicates that research should investigate opportunities that exist for virtual reality-based education (Di Natale et al., 2020).

Diffusion is the process that an innovation undergoes as it is communicated through social systems over time (Rogers, 2003). Understanding how innovations can reach mass media, Rogers (2003) suggested five attributes that persuade innovation diffusion. Relative Advantage is deemed how the innovation is seen to be better comparative to the existing innovation. Compatibility is the extent an innovation can be perceived to meeting past experiences or current needs of stakeholders (Rogers, 2003). Complexity identifies the innovation's perceived difficulty to use. Trialability underscores the degree an innovation can be tested before adopting, and observability refers to the visibility of the innovation by other members of a social system. Rogers (2003) determined all five attributes are positively correlated with innovation adoption outside of complexity.

## **Purpose and Objectives**

The purpose was to investigate virtual reality adoption as means of diffusing instruction in higher education institutions. The research objectives were:

1. Identify the virtual reality adoption attributes.
2. Discern virtual reality persuasion attributes in agricultural institutions.

## **Methodology**

The researchers conducted a systematic literature review to deeper explore the purpose of the research. A systematic review helps scholars understand others' ideas regarding findings and theories from related studies (Fraenkel et al., 2019). A systematic review is a research method utilizing a comprehensive search based on keywords to review existing literature with a combination of data focusing on related topics (Lee et al., 2021). The researchers examined publications implementing virtual reality as an instructional tool from eighteen ( $N = 18$ ) impact factor journals provided by the Web of Science (WoS) (2021). The WoS (2021) indicated seventeen higher education journals (*Internet and Higher Education, Assessment & Higher Education, International Journal of Educational Technology in Higher Education, Active Learning in Higher Education, Higher Education, Higher Education Research & Development, Journal of Marketing for Higher Education, The Journal of Higher Education, Teaching in Higher Education, Research in Higher Education, International Journal of Sustainability in Higher Education, Journal of Diversity in Higher Education, Higher Education Policy, Journal*

*of Computing in Higher Education, Journal of Geography in Higher Education, Journal of Higher Education Policy and Management, Review of Higher Education*) with an impact factor above 1.6. The researchers had access to sixteen of the journals as one publication did not have a subscription agreement with [university]. The additional journal is the *Virtual Reality* journal, the premier virtual reality technology journal, with an impact factor of 5.095 (WoS, 2021). The researchers limited the extent of the study by only reviewing published literature in the years 2016 to 2021.

### **Results and Conclusions**

In total, there were 217 ( $N = 217$ ) publications examined, with a focus on articles mentioning virtual reality instructional use in higher education. However, approximately 90% of the articles did not fit the search term criteria set by the researchers. The systematic review conducted by the researchers identified twenty-one ( $n = 21$ ) publications that did meet the search criteria.

The researchers established five common themes derived from the publications. Themes included higher education ( $n = 8$ ), experiential learning ( $n = 3$ ), gamification ( $n = 3$ ), eLearning ( $n = 6$ ), and virtual reality ( $n = 6$ ). Themes derived from this systematic review could be generalized into these groupings based upon the articles. Pellas et al. (2021) identified that key characteristics of virtual reality use in higher education can stem to experiential learning, usability issues, student learning outcomes, and overall learning performance. Fromm et al. (2021) detected items such as virtual reality, higher education, and experiential learning are all factors into virtual reality use for instruction in higher education. Students' perceptions of virtual reality use during the COVID-19 pandemic were positive, as reported by De Ponti et al. (2020).

Hagge (2020) displayed how higher education students in geography are able to learn via virtual reality technologies. Therefore, literature indicated virtual reality can be a dissemination tool for specific instruction. The researchers found six ( $n = 6$ ) of the seventeen ( $N = 17$ ) journals produced key term results based on the systematic review and eleven ( $n = 11$ ) journals were void of the key terms. The researchers also identified one of the WoS (2021) impact factor journal for higher education provided zero ( $n = 0$ ) results when examining virtual reality instructional use in higher education. The data indicated virtual reality use in higher education agricultural institutions is non-existent in the literature.

### **Recommendations and Implications**

Developing an understanding of virtual reality attributes is needed prior to agricultural instructors' adoption of the instructional technology (Rogers, 2003). By understanding what virtual practices are being adopted in higher education institutions, researchers can provide agriculturalists information on new instructional technologies, teaching techniques, and recommended practices for improving student learning. The pandemic has illuminated the need for digital instructional tools to assist students achieve learning outcomes regardless of their location, time, and accessibility. Virtual reality can diffuse climate impacts on agriculture to a large populous (Strong et al., 2022). The global nature of education and business dictates future inquiries of virtual technologies will be needed by agricultural institutions and extension systems to ensure our field is meeting the needs of clientele in a timely manner.

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**Perspectives on Food Security through the Lenses of Food Wastage for International  
Agricultural Extension Education**

Olawunmi T. Ilesanmi

Department of Agricultural Leadership, Education and Communications

Borlaug Institute for International Agriculture

Texas A&M University

578 John Kimbrough Blvd. Suite 201, Office 249

College Station, TX 77804

wunmi.ilesanmi@ag.tamu.edu

Dr. Jack Elliot

Department of Agricultural Leadership, Education and Communications

The Borlaug Institute for International Agriculture

Texas A&M University

*Keywords:* food security perspectives, food loss, food waste, international agricultural extension

## Introduction

As we approach 2030, the world is not on track to achieve the United Nations sustainable development goals (SDGs), especially the zero-hunger target, and responsible production and consumption (Food and Agriculture Organization of the United Nations [FAO] et. al., 2019). There is a growing body of literature that recognizes the magnitude of food loss and waste termed *food wastage*, and the attendant implications on food insecurity, increasing environmental footprint, accentuated socio-economic burden, and limiting potential of the SDGs (FAO, 2013; FAO, 2018; FAO, 2020; Irani et al., 2018). The current burden of food insecurity leaves 815 million citizens hungry, and one in every three humans suffering from malnutrition globally (FAO, 2020). However, one third of world's food produced is lost, with approximately 14 percent loss occurring *upstream*; between post-harvest and retail levels, while 17 percent is wasted *downstream*; at retail and consumption levels (FAO et. al., 2019; Irani et. al., 2018; United Nations Environment Programme [UNEP], 2021). Poverty and high international food prices remain a threat globally, yet one out of every four calories produced for human nourishment is not consumed by humans (FAO et. al., 2019; UNEP, 2021). Consequently, it invokes an unproductively vain use of land, water and energy which creates a triple planetary crisis (UNEP, 2021). Several literatures attribute these challenges to limitations and inadequacies across managerial, financial, and efficient techniques throughout the agricultural value chain and poor rural urban linkages (Irani et. al., 2018). Importantly, current food systems are grossly inadequate to achieve food security for the 10 billion people projected to live on earth by 2050 (FAO, 2021; Searchinger, et. al., 2019; UNEP, 2021), especially considering earth's finite natural resources (Irani et. al., 2018) and challenges exacerbated by unprecedented shocks such as the Coronavirus pandemic (Fanzo et. al., 2020). Several intersectoral strategies are being proposed as integrated transformative innovation, and agricultural extension education is crucial to drive engagement and dialogue, centered on interconnectedness to eradicate food insecurity and hunger, improve sustainable natural resources, and share knowledge to reduce damaging agronomic practices on the planet's ecosystems (FAO, 2018; FAO, 2020; Irani et al., 2018). However, there are knowledge gaps for agricultural extension education and further research on approaches for improved methods of data collection, monitoring target indicators, and evaluating metrics are needed.

## Purpose and Objectives

Our goal was to research food security perspectives through the food wastage lens. Our primary objective was to conduct a synthesis of the available literature by investigating the problem of food insecurity and food wastage to understand the scale and impact. Furthermore, to explore the role of international agricultural extension education at status quo and finally identify solutions and recommendations within literature on possible intervention. We purposed to share our

findings with relevant actors and audiences to drive dialogue on perspectives, gaps, and further research interests

### **Data Sources**

We conducted electronic web-based research on primary sources, reference lists and gray literature using our keywords. We tailored our data collection using inclusion criteria of reports from key custodians and empirical research. We snowballed relevant peer reviewed literature to account for the role of International agricultural extension education and we synthesized our data to identify emerging themes for further research.

### **Conclusions**

Studies report tackling food wastage is an untapped opportunity with action significantly relevant across the globe (UNEP, 2021). Strategies to combat the problem of food wastage proposed in several studies have not been by prevention, but by mitigating negative consequences (Żmieńka & Staniszewski, 2020). Approaches for advancing food systems are multisectoral with evidence-based research and knowledge management as an integral driver (Fanzo et. al., 2020). Several ways to improve and transform food systems, including existing and new policies are suggested through engagement of multilayered management perspectives to impact resiliency, particularly pre-planning, education, and training on improvement activities to impact people and their social-level knowledge (Kennedy et. al., 2020). The SDGs target 12.3 is hinged on reducing per capita global food waste at the upstream and downstream levels by at least fifty percent (FAO, 2021). A deeper understanding of the problems and relationships between actors is needed and more knowledge sharing on approaches that will provide immediate, practical solutions for sustainable agricultural food systems.

### **Educational Importance**

Our findings from literature establish a baseline for future research studies and we reckon international agricultural extension education as universally relevant actors, to galvanize actions towards achieving zero hunger with minimal food wastage. This research underpins the need for prioritizing and coordinating efforts across multiple platforms and levels, for farmer education and private sector engagement to establish mechanisms of best practices across upstream and downstream activities (Irani et. al., 2018, Segre et al., 2014). Our research findings capture recommendations that are being proposed to address the challenges identified, ranging from use of digital technology, food redistribution channels, food recycling, innovating energy

optimization, big data, and context specific approaches, all of which require knowledge distillation across stakeholders. Evidence suggests targeting agricultural education for both men and women provides a stronger case to advance and adopt innovative practice in developing countries (Ragasa et. al., 2019). An important component is to target inclusion of post-harvest improvements in curricula for agricultural education and policy. This would enable extension educators to design location specific interventions to prevent food loss upstream, particularly in Sub-Saharan Africa where short perishable life cycles crops are prevalent (World bank, 2011). Furthermore, there are widely acknowledged knowledge gaps in measuring food wastage and new methods are suggested for prioritization and repurposing actionable education to transform food systems for responsible production and consumption. Summarily, engagement of food chain actors on behavioral, practices and technological changes is crucial for long term sustainability. A sound evidence base is paramount to support good investment and policy decisions to build food security from food wastage.

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**A Podcast Ethnography: Exploring COVID-19's Effect on the Scientific Enterprise**

Jacqueline Aenlle  
University of Florida  
PO Box 112060  
Gainesville, FL 32611-2060  
jaenlle@ufl.edu

Jamie Loizzo  
University of Florida

Maegan Meredith  
University of Florida

Alice Akers  
University of Florida

Keywords: Podcast Ethnography, Scientific Enterprise, COVID-19, Science Communication,  
Adaptability

**A Podcast Ethnography: Exploring COVID-19's Effect on the Scientific Enterprise**

## Introduction and Conceptual Framework

The COVID-19 pandemic has impacted universities, researchers, and the scientific enterprise (Daniel, 2020; Myers et al., 2020). Education systems across the globe have faced various challenges from COVID-19, including supporting students, transitioning courses to online formats, and more (Daniel, 2020). Scientists with children, female-researchers, and those whose research depend on a lab experienced extra pressure (Myers et al., 2020). The conceptual framework guiding this study included adaptability and mental health. Previous research found that public health emergencies affect not only the physical health of individuals and communities, but also their emotional well-being (Pfefferbaum & North, 2020). Adaptability is essential to maintain mental health and respond efficiently to change and uncertainty (Calarco, 2006; Reupert, 2020).

## Purpose and Questions

The purpose of the study was to explore COVID-19 impacts on agricultural and natural resource scientists, graduate students, and the scientific enterprise at a land grant university. Research questions included:

RQ1) How did COVID-19 impact podcast interviewees' teaching, research, and Extension-related work?

RQ2) How did podcast participants navigate the pandemic in their personal lives?

RQ3) In what ways did podcast participants showcase adaptability in response to COVID-19?

## Methods

Digital ethnography is a qualitative methodology that encompasses the study of online experiences and communication via a variety of formats such as social media, video, and audio (Pink et al., 2016; Varis, 2016). As podcasts have grown in popularity (Edison Research & Triton Digital, 2020), researchers have recently outlined an emergent podcast ethnography method that includes three steps (Lundström & Lundström, 2020): explore (describe the research site), engage (listen to a defined set of tracks), and examine (study the purpose, process, and content/themes of the podcast).

We explored the Streaming Science spring 2021 podcast series titled *The State of the Scientific Enterprise During COVID-19*. Streaming Science is an online platform housed at the University of Florida in partnership with faculty and students in the Department of Agricultural Education and Communication. Students, a graduate teaching assistant (first author), and faculty member (third author) in a course titled *Podcasting to Increase Science Literacy* interviewed scientists, Extension experts, and graduate students throughout the University of Florida Institute of Food and Agricultural Sciences and produced 17 podcasts between 11 to 40 minutes long.

In the engage step, we listened and reflected upon the content and other qualities of the podcast. Before listening to the podcast data, we agreed upon a codebook that included interview categories about research, Extension, teaching, personal life, barriers/opportunities, adaptability,

and other notes including timecodes for specific observations. Finally, we compared our empirical field notes and code sheets, collapsed codes into categories, and categories into themes.

## **Results and Conclusions**

### ***COVID-19 changed how instructors and students engaged, slowed the pace of research, and moved Extension programs online (RQ1).***

While changes in teaching practices and delivery appeared to be manageable, some interviewees described difficulties engaging students in online formats. A graduate teaching assistant in agricultural communication described her teaching approach during COVID-19, “I think just being really honest, really flexible, just trying to meet students where they were. Like if they couldn’t come to office hours, try to make special arrangements, because things were just different.” Scientists described closing labs and re-opening them with social distancing modifications. They also discussed how COVID-19 slowed down data collection in the field, analysis in the lab, and communication for collaboration across grant projects. Interviewees working in Extension described moving programming to online formats and helping stakeholders at a distance. Though many Extension offices and communities have disaster response plans in place, several found COVID-19 to be an extenuating circumstance they were not prepared for: “It’s been interesting to see, how do we normally respond to our emergency situations, but yet do it with COVID in mind.”

### ***COVID-19 increased the amount of time that faculty and staff spent at home with their families and emphasized the importance of mental health and work-life balance (RQ2).***

Several scientists mentioned the challenges of working from home with young children while isolated from family and without childcare options. An assistant professor said, “Dealing with the pandemic with a young child has been really difficult, and I also worry about my grad students and loneliness being an issue for them.” Others also mentioned some unexpected positive opportunities that arose including increased time with family and time to focus on mental health.

### ***COVID-19 led individuals to adapt rituals and practices in their professional and personal lives to their new environment (RQ3).***

Participants adapted to the pandemic through adoption of new online platforms for communication, recreated lab schedules, became more emotionally engaged with students, and developed new methods to continue research. One doctoral student discussed how people adapted to being more familiar with online video conferences: “It really pushed everybody to be more comfortable online and be more comfortable collaborating over greater distances.” Along with the changes in content delivery, educators also adapted their interactions with students. An associate professor stated: “I think a big focus has turned to mental health with my students, trying to, you know, through Zoom which is tough, but trying to size them up and figure out, are you okay? Are you getting what you need?”

## Implications and Recommendations

The COVID-19 pandemic has had various lasting effects on universities, the scientific enterprise, and the individuals working within these settings globally. A noteworthy result was the appearance of positive comments immediately following any description of a COVID-19 barrier or challenge. Future research should examine the role of positive psychology during the pandemic and in crisis communications. We also recognize the need for future, longitudinal research that examines the resiliency of these groups.

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**Culture and COVID-19: Global implications of perceptions of race and cultural relations during the COVID-19 pandemic in the United States**

Sydney Honeycutt: Family, Youth, & Community Sciences; Center for Public Issues Education in Agriculture and Natural Resources, University of Florida  
1408 Sabal Palm Drive, Second Floor  
Center for Public Issues Education in Agriculture and Natural Resources  
University of Florida, Gainesville, FL 32611

Cheng-xian Yang: Department of Agricultural Education and Communication; Center for Public Issues Education in Agriculture and Natural Resources, University of Florida

Lauri M. Baker: Department of Agricultural Education and Communication; Center for Public Issues Education in Agriculture and Natural Resources, University of Florida

Olivia Doyle: Department of Agricultural Education and Communication, University of Florida

Jarred Shellhouse: College of Agriculture & Life Sciences, University of Florida

Cecilia “CC” Suarez: Department of Agricultural Education and Communication, University of Florida

**Keywords: COVID-19, Intercultural Relations, Equity, Rural Communities, Extension Programming**

# **Culture and COVID-19: Perceptions of race and cultural relations during the COVID-19 pandemic in the United States and implications for Extension programming**

## **Introduction**

Amid the COVID-19 pandemic, society has witnessed tensions related to race and culture. In the U.S., incidents of racially motivated discrimination toward underrepresented communities have increased (Chen et al., 2020). Similar events have taken place around the world, identifying intercultural relations during COVID-19 as an issue of international significance (Ouassini et al., 2021; Ahuja & Banerjee, 2021). Discrimination is especially prevalent in rural and agricultural communities, exacerbating pre-existing health and social disparities (Lopez-Cevallos et al., 2014; James et al., 2017).

Underrepresented groups have experienced disproportionate impacts of COVID-19, such as higher rates of hospitalization and mortality (Moore et al., 2020). Due to their role within communities, Extension professionals have the capacity to mitigate impacts by enhancing community resilience and improving social capital (Rodriguez, 2021).

Social identity theory (Tajfel et al., 1979) and intergroup anxiety (Stephan, 2014) were referenced to provide theoretical explanations. Using the equitable resilience framework established by Matin et al. (2018), researchers explored potential community-level implications of perceived intercultural conflict. By understanding how Americans perceive race and cultural relations during a pandemic, Extension professionals can target programming to reduce disparities, improve equity, and promote resilience.

## **Purpose**

The purpose of this study was to understand Americans' perceptions of race and cultural relations during the COVID-19 pandemic and provide recommendations for Extension professionals to reduce the implications of racial and cultural tensions. Two objectives guided the study:

1. Identify the level of concern for underrepresented groups during the pandemic.
2. Examine the relationship between concern for underrepresented groups and demographics such as race, income, education level, and political beliefs.

## **Theoretical Framework**

Social identity theory asserts that individuals develop a sense of identity based upon membership to certain social groups (Tajfel et al., 1979). Intergroup anxiety is defined as feelings of apprehension or fear when interacting with individuals from a social group other than their own (Stephan, 2014). Due to fear and health threats, pandemics impact how individuals perceive members of other groups (Van Bavel et al., 2020).

Community resilience is defined as the ability for a community to “absorb, manage and bounce back after a disaster,” (Joerin et al., 2012). Equitable resilience specifically addresses the social vulnerability of underrepresented populations by examining the cultural, political, and social factors that influence resilience. (Matin et al., 2018).

## **Methods**

Data were collected from January 8 to 21, 2021, using an online survey distributed by Qualtrics. The sample included 1,549 adult Americans with similar characteristics as the U.S. Census related to ethnicity, region of the U.S., gender, and age. Respondents were asked a series of questions pertaining to race and culture during the COVID-19 pandemic. First, respondents were asked whether they were concerned or not about various racial and cultural issues. If respondents said they were concerned, they were then asked to indicate their level of concern on a five-point Likert-type scale of slightly concerned (1) to extremely concerned (5). Data were combined in analysis to create an ordinal variable for each item with 1 = not concerned to 6 = extremely concerned. The questions were: “Q1: How concerned are you about illegal immigrants and/or non-citizens currently residing in the United States not seeking medical attention if they believe they have contracted COVID-19?”, “Q2: Indicate your level of concern that COVID-19 is making race and cultural relations worse in our society”, “Q3: Indicate your level of concern that COVID-19 is creating a cultural divide in the United States.”, and “Q4: Indicate your level of concern that COVID-19 is making it harder for underrepresented groups to achieve the American dream”. This scale (Cronbach’s alpha = .799) measured American’s attitudes toward underrepresented groups during COVID-19.

Additionally, participants were asked in an open-ended format “why” after they indicated if they were/were not concerned about culture and race relations in the U.S. during COVID-19. These responses were analyzed for sentiment using Nvivo, which automatically codes data for sentiment (very negative, moderately negative, moderately positive, and very positive).

## **Results**

Results showed that people with different demographic characteristics have different perceptions of race and cultural relations during the pandemic. Hispanic, Latino, and Chicano participants reported higher levels of concern for all four items. Compared to white respondents, Asian respondents were more concerned about race and cultural relations (Q2, Q3), and Black respondents were more concerned these issues may cause the American dream to be harder to achieve (Q4). Findings indicated that education is an influencing factor in how Americans perceive race and cultural relations during COVID-19. Respondents with higher education levels were more concerned about COVID-19 making race and cultural relations worse in the U.S. Residents living in rural areas were less concerned about these issues than those living in urban areas.

This study also considered the influence of respondents’ beliefs and attitudes. People who identified as liberal were more concerned about race and cultural issues. Democrats showed more concern than Republicans. Positive attitudes toward vaccines were highly correlated with the degree of concern about race and cultural issues. Participants who planned to receive or already received the vaccine reported greater concerns about race and cultural relations.

NVivo sentiment analysis results indicated difference in sentiment of those who were not concerned with cultural and race issues and those that were. Sentiment breakdown for those concerned was  $n = 75$  very negative;  $n = 145$  moderately negative;  $n = 33$  moderately positive, and  $n = 14$  very positive. Those who indicated they were not concerned about cultural and race relations sentiments were coded as  $n = 112$  very negative;  $n = 361$  moderately negative;  $n = 36$  moderately positive, and  $n = 19$  very positive.

## Implications and Applications

The results of this study can be used to inform the development of Extension resources and programming materials to reduce health disparities during the pandemic. By understanding the demographic factors that influence Americans' perceptions of race and cultural relations during COVID-19, Extension professionals can intentionally target necessary populations to promote equity. Recommendations specifically address rural and agricultural communities, which experience higher disparities on an international scale (Singh et al., 2012).

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Maize farmers' preference and trustworthiness in the sources and channels to receive agricultural information in Dormaa, Ghana: A gender perspective.

Namah Taku-Forchu, Iowa State University  
227 Curtiss Hall  
Ames, IA 50011  
Email: [namah@iastate.edu](mailto:namah@iastate.edu)

Misty D. Lambert, North Carolina State University  
Michael S. Retallick, Iowa State University  
Jonathan D. Ulmer, Kansas State University  
Shuyang Qu, Iowa State University  
George P. Opit, Oklahoma State University

Keywords: Post-harvest loss, hermetic storage technology, maize storage, Ghana

## **Introduction and literature review**

Agriculture plays an important role in the Ghana economy. It accounts for about 17.3% of Ghana's Gross Domestic Product (The World Bank, 2020), employs nearly half of the labor force, and contributes significantly to the country's poorest households' livelihoods (The World Bank Group, 2018). In Ghana, maize tops the chart in food crop production in the area planted and accounts for about 50-60% of total grain production (Danso et al., 2017). It is also the main dietary staple and a major input to animal feed. However, a significant amount of maize produced does not leave the farm and make it to the plate. It is lost along the value chain with about 30-40% lost at the storage level (Opit et al., 2014). The post-harvest loss is attributed to traditional methods farmers use to store maize after harvest, exposing the maize to insects, pests, and mold contamination (Darfour & Rosentrater, 2016; Gitonga et al., 2013; Manu et al., 2019). One possible solution is the use of hermetic storage bags which limit gas exchange to control degradation related to insects and moisture. To reduce post-harvest losses of maize and improve food security, access to information and knowledge about these technologies is critical and a challenge that hinders the adoption of agricultural commodities.

Women and men face different challenges and severity in adopting agricultural technologies. In developing economies, unequal access and use of new technologies is a significant challenge to technology adoption by female and male smallholder farmers (Ndiritu et al., 2014). Women play a significant role in the post-harvest stage (Nordhagen, 2021; Sawadogo-Ouedraogo et al., 2017). Although women are commonly involved in post-harvest management activities, men decide on resource allocation and use related to post-harvest activities (Abdulsalam-Saghir et al., 2015). This has an impact on the adoption of hermetic storage bags by women maize farmers. Studies

have shown a slower rate of agricultural technology adoption by women compared to men (Aduwo et al., 2017; Doss & Morris, 2001). Access to information will accelerate the rate of adoption of an innovation by both male and female farmers. Information needs to be accessible through appropriate and reliable information channels. According to Musa et al. (2011), communication increases the rate of adoption of new agricultural practices since information and knowledge gained drives farmers to try innovations. Access to diverse information sources perceived valuable by farmers influences adoption (Toma et al., 2018). Identifying the different sources/channels and farmers' preference and trustworthiness provides a roadmap to scale up adoption of hermetic storage technology.

### **Theoretical/Conceptual Framework**

This study uses the Source Credibility and the Uses and Gratifications Theories to examine maize farmer's sources and information channels used to access information and knowledge of hermetic storage technologies, level of trustworthiness, and preferred information sources and communication channels.

Hovland et al. (1953) developed the source credibility theory asserting there is a high chance for people to be persuaded when the source of information is perceived as credible. Hovland et al. (1953) defined source credibility based on expertise and trustworthiness. Users of information consider a source credible when they can trust the information, they receive from it. Source credibility is critical component researchers use to assess the uptake of agricultural innovations (Lamm et al., 2016).

Katz et al. pioneered the Uses and Gratification theory in 1973. The theory explains audiences' choices in selecting media channels that fulfill audience desires (Lin, 1999). The audience often seeks communication to satisfy their needs. When the audience is exposed to an information source or communication channel they trust, they derive gratification after consuming it (Lin, 1999). Trust and media use are found to have a positive relationship (Tsfati & Cappella, 2003)

### **Purpose and Objectives**

Given the role communication plays in disseminating and adopting agricultural innovations, this study aims to identify the sources of information, preference, and trustworthiness of the different sources /channels maize farmers obtain information on agricultural activities in Dormaa, Ghana.

Specifically, we sought to:

- Ascertain the different sources/channels maize farmers use to access agricultural information.
- Identify differences regarding male and female farmers' preferences in the various information sources/channels.
- Identify male and female farmers' differences regarding trustworthiness in the various sources and channels.

### **Methods**

The study was conducted in the Dormaa municipality located in the Middle Belt of Ghana.

Dormaa was selected for this study because the United States Agency for International Development (USAID) through Feed the Future Postharvest Innovation Lab (PHLIL) identified

this area as a high maize production zone (Opit et al., 2014). Currently, they are training and disseminating hermetic storage technology in the area, more specifically with poultry farmers.

This study is funded by the Feed the Future PHLIL.

The multistage, random sampling technique was used for the study. In the first stage, Dormaa was selected. In consultation with extension agents, four communities were selected where maize is the main economic activity. A random sampling technique was used to select 217 maize farmers to solicit information on the different sources/channels, preferences, and the level of trustworthiness in the various sources/channels through which farmers receive information. We used both open and close-ended survey questions.

## **Results**

The demographic results show that 58.41% (n=125) of farmers who participated in the study were males and 41.59% (n=89) females. More males (64%) adopted the hermetic bags than females (36%). The mean age of the farmer was 44.05 years. Most respondents (80.98%) indicated they received information about their agricultural activities from extension agents. This was followed by fellow farmers (71.08%) and radio (70.73%). Newspapers (3.96) and posters/billboards (9.85%) were communication channels farmers received the least information. The result of the preference of communication channels/sources for male and female farmers, the results reveal there are no significant differences between male and female farmers' preference for newspapers (t=0.11), radio (t=0.14), Agro-dealers (t=0.42), fellow farmers (t=0.55), and posters/billboards (t=1.58). However, the results show a significant difference between male and female preference for extension professionals (t=2.88). More males preferred extension agents

for information than females. Based on farmers' level of trustworthiness for these channels/sources, the results show a significant difference between male and female farmers' level of trustworthiness for telephone calls ( $t=3.47$ ), posters/billboards ( $t=3.22$ ), friends/neighbors ( $t=2.63$ ) and fellow farmers ( $t=2.55$ ). However, there is no significant difference regarding male and female farmers' level of trustworthiness for extension professionals. This indicates that male and female farmers in Dormaa behave similarly in terms of trust in extension agents to obtain information about their agricultural activities.

### **Recommendations**

The results reveal high use, preference, and trustworthiness for extension agents. It is recommended that policymakers, NGOs, and other stakeholders increase extension training activities in the area. Also, it is recommended that extension agents organize training programs targeting increased women's participation. Extension agents should send information about training to women groups to enhance women's participation. Given respondents' preference for radio, more radio programs, especially in the local language of Twi, should be encouraged and broadcast at hours convenient to farmers. These programs should target evenings and weekends when farmers are at home.

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Investigating the impact of COVID-19 on African Regional Economic Communities (RECs); A  
Case Study of 'The Continental SPS Committee'

Olawunmi Ilesanmi

Department of Agriculture, Leadership, Education and Communications  
Texas A&M University  
Norman Borlaug Institute of International Agriculture and Development

Megan Gould

Department of Agriculture, Leadership, Education and Communications  
Texas A&M University  
Norman Borlaug Institute of International Agriculture and Development

Dr. Jack Elliot, Regional Director for Africa

Norman Borlaug Institute for International Agriculture and Development  
Professor, Department of Agriculture, Education and Communications  
Texas A&M University

Contact Information:

Dr. Jack Elliot

Texas A&M University  
AGSV Building, Suite 201, Room 216  
College Station, TX 77843  
jelliot@tamu.edu

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Regional Economic Communities (RECs)

## **Introduction**

The coronavirus disease (COVID-19) disrupted the world with attendant impact on agricultural productivity, food insecurity, trade, and socio-economic environment in Africa (Willy et al., 2020). Notwithstanding emergency responses to mitigate the pandemic, the African Union (2019) reported about 8 million positive cases, with a death burden estimate at 2.5% by September 2021. Previous disaster responses informed several policies from international developmental organizations on essential services like agricultural production, trade, and food distribution to reduce the negative impact on vulnerable populations (Brenton & Chemutai, 2020). In Africa, agriculture is crucial for socio-economic activity and more than 60% of African value added in global exports is embedded into European production indicating a global reliance on the agricultural value chain (Banga et al, 2020). Prior to the pandemic, several countries in the Sub-Saharan African region struggled with dwindling economic situations, food shortages, floods, armyworm invasions, insecurity, terrorism, and instability (Willy et al., 2020).

Evidently, additional shocks to supply and demand can potentially exacerbate agricultural supply chain and food insecurity, as corroborated from studies that the pandemic affected smallholder farmers, pastoralists, and fishermen the most (Ouayson, Bai, & Osei, 2020). An important component of the agricultural value chain is the Sanitary and Phytosanitary (SPS) systems which ensures agricultural trade protects human, animal and plant health. The SPS responsibly holds farmers, herders, traders, distributors, retailers, regulators, and consumers accountable to produce and demand safe agricultural products for the African continent (African Union Department of Rural Economy and Agriculture, 2019). Understanding the response of RECs from the SPS preparedness, preventive and protective lenses are important to assessing the impact on the value chain and by extension, vulnerable stakeholders within Africa and the global ecosystem (African Union Department of Rural Economy and Agriculture, 2019).

## **Purpose and Objectives**

Our study was to gain practical understanding of responses from the Regional Economic Countries (RECs), specifically, the Continental SPS Committee on the COVID-19 pandemic. One of our objectives was to identify the engagement at different country levels, multi-stakeholder collaboration ongoing to mitigate impact on agricultural production, food security and trade flow within the RECs. Furthermore, we aimed to gather context-specific data that demonstrated appropriate actions were ongoing to protect human, animal and plant health. Finally, we intended to disseminate functional information to educate and improve practice among relevant audiences.

## **Methods**

We deployed a mixed methods approach, using a desk review of credible primary sources, and a participatory survey with interview questions. Our sample was specifically the Continental SPS Committee, which is a technical committee made of leaders across Agriculture, Rural Development, Water and Environment Sectors in the African Union (AU). The AU recognizes

eight different regional economic communities (RECs) that are under the administration as followed: The Arab Maghreb Union (UMA), Common Market for Eastern and Southern Africa (COMESA), Community of Sahel-Saharan States (CEN-SAD), East African Community (EAC), Economic Community of West African States (ECOWAS), Intergovernmental Authority on Development (IGAD), Southern African Development Community (SADC), and the Economic Community of Central African States (ECCAS). Our survey was administered electronically using a questionnaire with three targeted questions to measure the impact of COVID-19.

1. How were they coping with the pandemic?
2. What were their competencies in dealing with the pandemic?
3. What was the difference within rural and urban communities?

We used the Zoom platform to conduct the interviews. Our data was collected, organized into a matrix format, responses were analyzed, and peer reviewed to develop overall thoughts, skills, and adaptations demonstrated.

## Results

We observed a significant disruption to “business as usual” across the spectrum. Given that the pandemic was unprecedented, preparedness, preventive and protective actions evolved over time. A consensus on coping mechanisms were the immediate restriction on movements to only essential workers, shift to usage of masks, hand washing, social distancing and improved hygiene and sanitary precautionary environmental practices. Attention was given to onsite testing, regular communication, dedicated hotlines to handle the barrage of information and engagement of multilateral stakeholders to mitigate the spread.

Competence levels across various adaptive and protective initiatives were a common theme, including the use of technology, safety protocols, standardized operations procedure, resources database, virtual engagements, and redesigning work environment to mitigate exposure and control the spread strategically. Interestingly, the majority reported a multi-sectoral collaboration and partnership that validated the importance of collaborating to achieve effective adoption of ideas within their regions. Conversely, there were reports of complacency against the safety protocols as months passed, inadequate vaccine and medical infrastructures, lag in international trade while addressing quarantine regulations and limited agricultural extension services.

Furthermore, they highlighted the disparity between urban and rural communities in the number of positive COVID-19 cases, safety protocol compliance levels, better agricultural extension services, regulatory oversight on food businesses, essential infrastructure and medical facilities and population density, with rural communities reportedly the most vulnerable across the RECs. Finally, the REC leaders raised awareness on creeping COVID-19 fatigue, noticeable depression and low morale among smallholder farmers, high cost of farm inputs, closing of small agro businesses and financial burden to aid recovery from the pandemic. These concerns are correlated across findings as an indicator to exacerbate food insecurity, agricultural productivity (Banga et al., 2020; Willy et al., 2020).

## Recommendations

Our study spotlights the need for relevant stakeholders to engage reflective lenses on the impact of COVID-19, especially in developing communities to promote capacity building and provide adequate oversight functions on SPS, crucial to preventing compromise in human, animal, and plant health. Evidently, there is a need to design appropriate country specific responses to address the low morale and mental health of agricultural farmers for sustained agricultural productivity, especially zero hunger. The positive adoption of digitalization can be a useful leverage to enhance agricultural innovative practices.

Our findings reinforce the importance of capacity building, responsible leadership, and functional agricultural education to enhance sustainable development goals. It not only impacts the AU, but the global ecosystem. We hope that international development organizations find it relevant to better understand the responses within RECs and channel effective policies to advance sustainable development goals.

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**Linking human capital development to women's empowerment and inclusion: Results  
from four country case studies**

Kristin Davis, International Food Policy Research Institute

Johanna Gammelgaard, Independent Consultant

John Preissing, FAO Investment Center

Corresponding author: Kristin Davis, 1201 I St NW, Washington, DC, 20005, USA,

[k.davis@cgiar.org](mailto:k.davis@cgiar.org)

**Keywords:** Human capital, education, empowerment, inclusion

## **Introduction**

Human capital development is crucial for addressing challenges in global agri-food systems, from sustainably feeding growing populations to finding innovative solutions for resilient and climate-smart agriculture (see Davis, Gammelgaard, Preissing, Gilbert, & Ngwenya, 2021). Human capital—the stock of habits, knowledge, skills, and social and personality attributes embodied in the ability to perform labor to produce economic value (Goldin, 2014)—includes the skills and capabilities of small-scale farmers to successfully manage farming enterprises.

Empowerment is often an objective of human capital development initiatives, including literacy education (James & Trail, 1995); student-centered learning approaches (Mukembo, Edwards, & Watters, 2020); 4-H (Deen, Scanga, Wright & Berahino, 2017); and farmer field schools (David, 2007; Davis, Nkonya, Kato, Mekonnen, Odendo, Miiro, & Nkuba, 2012). According to Friis-Hansen (2004), empowerment is an advanced type of participation whereby farmers make decisions themselves, rather than adhere to others' recommendations.

Linked with empowerment is gender equality and social inclusion (Drucza & Abebe, 2018) which is important to make sure all citizens benefit from agricultural development. However, women especially need empowerment and inclusion since they often lack access to services (Magnan, Love, Mishili, & Sheremenko, 2020).

## **Purpose and objectives**

This paper draws from four case studies to understand how human capital development initiatives can increase women's inclusion and empowerment. We examine how human capital development can result in improved skillsets among women, which allow them to participate in economic or social activities, thus enhancing inclusion; and result in empowerment through



changes in social structures around women's roles. We provide recommendations for increasing investments in women's human capital in agriculture and rural development programs.

## **Methods**

A case study approach captured detailed insights into human capital development initiatives. Case studies help explore complex phenomena from diverse perspectives where context is a salient factor, thus are a rigorous and appropriate methodology to describe human capital development in agricultural contexts (Baxter & Jack, 2008). Four case studies are examined here which have particular focus on women's empowerment and inclusion from Chile, India, Kenya, and Rwanda.

Case study teams conducted literature review and document analysis, then collected primary qualitative data using key informant interviews and focus groups, mainly virtual. Semi-structured interview guides ensured comparability across cases. Primary data collection methods were determined by accessibility and respondent safety during the COVID-19 pandemic. All instruments were examined by a panel of experts for face and content validity. The study was approved by the International Food Policy Research Institute's Institutional Review Board.

## **Results**

Results from the case studies show a link between human capital development and increased skillsets of women farmers, leading to changes in social structures and attitudes regarding women's participation in agricultural endeavors.

The approach used in a public-private partnership program in Chile promoted development of communication and interpersonal skills. Some respondents felt that women in the program benefited through developing these skills. The program "set women very high up," according to a male berry farmer. A female producer said, "I am one of the women who have

dared to go out on field trips, have a voice to ask questions, and sign up for projects,” suggesting that the program has promoted her empowerment.

In India, women were trained as community service providers and master trainers for women livestock farmers. In addition to technical livestock expertise, these service providers and trainers gained skills and confidence in public speaking and advisory roles, resulting in greater self-reliance and empowerment, and recognition and respect in their communities. The master trainers began participating in the local village council, and community members reached out to trainers for advice.

The Kenyan case provided evidence of women’s empowerment, especially within household roles. Due to training on family budgets and gender awareness, participants experienced changed mindsets around gendered roles and thereby a more equal division of labor, lowering women’s heavy workload. “The issue of gender was new to me; my husband knew sweeping, fetching water was my responsibility; I went to the farm, washed clothes. When we got the training about gender, we realized we could help each other with these responsibilities. After training, he changed,” said one female farmer.

In Rwanda, farmer field schools focused on gender, women’s empowerment, critical thinking, experimentation, innovation, community empowerment, mindset change, and collective action. Interviewees reported increased confidence due to participation, which was translated into an ability to make decisions that they said positively affected production and productivity.

To ensure women’s empowerment and inclusion while building human capital, motivation and peer learning were key. In Kenya, the trainings on smallholder horticulture empowerment were based on self-determination theory, which recognizes that raising people’s motivation increases their likelihood of continuing with implementation of intervention activities

on their own (Deci & Ryan 1985). In India, the case employed peer learning, which fostered self-confidence and provided role models. This model possibly affected roles in the community—educating women as experts can change perceptions among the trained women and women in general.

### **Recommendations, educational importance, and implications**

The findings imply that human capital development is more than imparting technical skills: it can lead to gender equality and social inclusion. The experiences across all four case studies included not just technical training and skills transfer but a focus on empowerment issues. As a result of the designs of these human capital development approaches, holistic competence development was realized. This encompassed the spectrum of technical, managerial, and soft skills and knowledge which were important in farmers' human capital development.

Agricultural educators and extensionists should be aware of the links between human capital development and women's empowerment and inclusion, and build skillsets that go beyond just technical training and technology transfer to bring about these larger goals of inclusion and empowerment. A further important implication is that future large-scale agriculture and rural development investment projects can more purposefully incorporate empowerment and inclusion in project design.

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## **Monitoring Bee Health Through Citizen Science in Western Uganda**

### **Authors:**

**Marianne Staniunas**

**Dr. Emily Otali**

**Dr. Elizabeth Ross**

**Gabriella Bragoli\***

**Turyatunga Vallence**

**Kajura Derrick**

**\*Corresponding Author**  
[gabrielladbragoli@gmail.com](mailto:gabrielladbragoli@gmail.com)

**Keywords:** Bees, bee health, citizen science, human-wildlife conflict

## **Introduction**

Citizen science is a vital tool in the pursuit of scientific advancement (Bonney et al., 2009). Derived from ecological, earth, and environmental sciences, citizen science is a research approach in which the members of the public are active participants in scientific research (Spasiano et al 2021). Since 1997, the Kasiisi Project (KP) has sought to conserve Kibale National Park in western Uganda through the support and engagement of its surrounding community. To bolster these populations KP, which operates with an entirely Ugandan staff, aims to foster a connection between education, health, and conservation. One such area of collaboration is the Bee Project, an ongoing citizen science project which seeks to assess the health of hives and the implications of pollinators in the Kibale ecosystem. For years, stakeholders have anecdotally reported a decline in pollinator and bee populations. Bees, an integral facet of any ecosystem, support the health of all other species (United Nations, 2018). Upon completion of the pilot program at the project operated farm, KP partnered with local farmers, the *Busiriba Beekeeping and Conservation Association*, and *Conservation to Co-Exist* to monitor hive health at the forest boundary and its surrounding communities. Through methods of community driven data gathering, the researchers sought to expand data collection efforts pertaining to bee health, facilitate beekeeping and data management workshops, and to deliver high quality, open-source data to the global scientific community.

## **Purpose/Objectives**

The KP Bee Project was established to utilize citizen science data collection methods to monitor bee health in and around Kibale National Park through the study of local hives and bee-fences established along the forest-boundary and within its neighboring communities. The grant-funded Bee Project also sought to build a robust network of farmers, beekeepers, conservationists, researchers, and students to contribute to an open-source data set and the global dialog surrounding bee health while aiming to equip future researchers in their study of rising pressure on wild African honeybees.

## **Methods, Data Sources, Participant Population and Study Area**

This ongoing research is bolstered by the Cornell Lab of Ornithology's (CLO) model for developing a citizen science project, which consists of the following steps: "Choose a scientific question; Form a scientist/educator/technologist/evaluator team; Develop, test, and refine protocols, data forms, and educational support materials; Recruit participants; Train participants; Accept, edit, and display data; Analyze and interpret data" (Bonney et al., 2009, p. 979). Per this model, the Bee Project's research team consisted of biological scientists, conservationists, beekeepers, and educators. This research is taking place in three districts in western Uganda which border Kibale National Park: Kabarole, Kamwenge and Kyenjojo. The study participants include 24 adult farmer-beekeepers (both male and female) from seven different community groups. In addition, the study recruited students from 16 government run primary schools which partner with KP: Kasiisi, Kiko, Kyanyawara, Kigarama, Rweteera, Rutoma, Mituuli, Kasenda, Pere-Achte, Iruhuura, Rwenkuba, Nyabweya, Kiteere, Kiamara, Kyakataru and Komyamperre. To facilitate accurate data, regular trainings are delivered to the farmers and their counterparts regarding equipment, hive maintenance, data management, and beekeeping practices.

This citizen science project is supported by two primary technologies: BroodMinder-TH devices and iNaturalist. The BroodMinder devices employ Bluetooth Low Energy technology to take hourly recordings of temperature and humidity within the hives (BroodMinder, n.d.). Data can then be downloaded to a smartphone and subsequently uploaded to an open-source Cloud site. As healthy colonies will maintain a temperature surrounding the brood of approximately human body temperature (~98°F) and a relatively constant level of humidity, tracking temperature and humidity data provides data about the relative health of a colony over time (Miekle et al., 2016). This data collection is supplemented with regular physical hive checks of all monitored hives. Seasonal forage data collected by study participants is uploaded to iNaturalist, an open-source data bank of plant and animal observations operated by the Nat Geo Society and California Academy of Sciences (iNaturalist, n.d.). These observations are made, uploaded, tagged with GPS information, and classified.

### **Results**

As of January 20, 2022, KP's Ugandan research team and farmer-beekeepers (study participants) have collected over 490,000 temperature and humidity readings, uploaded over 1300 iNaturalist observations, and conducted over 900 physical hive checks. While the research team and the farmer-beekeepers work in close coordination, the farmer-beekeepers collect all data regarding their apiaries independently of the research team. In conjunction with the data collection, the research team has delivered trainings which included information on apiary management, bee health, and principles of data collection. The initial results from the gathered data, particularly low honey yields and high rates of absconding, indicate that there is a high number of weak colonies within the study area.

### **Recommendations and Implications**

The goal of this research is to develop a robust dataset pertaining to pollinator populations, particularly that of wild African honeybees (*Apis mellifera scutellata*), in the Kibale region of western Uganda. According to Bonney et al. (2009), “[c]itizen science enlists the public in collecting large quantities of data across an array of habitats and locations over long spans of time” (p. 997). As the study's participants are currently limited to 24 farmer-beekeepers near Kibale, it is recommended that research is extended to surrounding communities and varying ecosystems within Uganda. This expansion should include an array of habitat and deliver beekeeping related extension education to additional farmers (Appenfeller et al., 2020). Moreover, further study may help inform beekeeping and apiary management practices that are incorporated into the conservation programs of KP, their counterparts, and the wider beekeeping community throughout Uganda. Additional data collection may also aid in assessing the viability of crop-raiding deterrents, such as bee-fences surrounding several kilometers of Kibale National Park. Such interventions aim to reduce human-elephant conflict (King et al., 2017) and enable farmers to derive additional income from sustainable, non-invasive activities.



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Urban Urgence: The Importance of Introducing Urban Farming with Secondary Agricultural  
Instructors in Northern Uganda

Nicholas Ssembalamu  
Field of Hope  
8805 Chambery Blvd, Suite 300-225  
Johnston, IA 50131  
uganda@fieldofhope.org

Joseph Apea  
Field of Hope

Agnes Obote  
Field of Hope

Alexa Major Wilcox  
Field of Hope

Jessica R. Spence  
The Borlaug Institute for International Agriculture  
Texas A&M University  
(corresponding author)

Dr. Tobin Redwine  
Vivayic, Inc. and Texas A&M University

## **Introduction**

The COVID-19 pandemic disrupted global food supply chains, creating new challenges for producers and consumers and increasing a need for urban gardens (Nicola, et al., 2020). The disruptions between rural and urban areas were especially noticeable in less-developed countries, specifically Uganda (Wetaya, 2020). Urban gardening provides fresh and safe food supplies during lockdowns (Nicola, et al., 2020).

Uganda went into lockdown to control coronavirus outbreaks in 2020, and again in 2021. Markets and schools were closed, creating food supply chain gaps and needs for alternatives for food purchase. As such, urban gardens provided a low-entry-barrier solution to fresh and reliable foods (Wetaya. 2020).

School-based agriculture programs who offer innovative practices in education can be valuable agents for change in communities (McKnight, 2020). Training secondary agriculture teachers in Uganda through hands-on instructor-led training (ILT) and offering curricula support has shown success and community impact in Uganda (Cannon, 2019).

As such, the pandemic created an opportunity and a need to equip agriculture teachers in developing nations with urban gardening skills to enhance and support communities.

## **Purpose and Objectives**

The purpose of this innovative idea was to host urban garden training, led by agriculture extension field officers, to equip secondary agricultural instructors with the knowledge and skills in urban agriculture production and technologies so that they may lead such efforts within their communities affected by lockdowns in Lira, Uganda in addition to supplementing their students' education when schools resume. The planned outcomes of the innovative training included: understanding of types of urban gardens, enhanced skills in establishing and maintaining urban gardens, and increased ability to market products from urban gardens. Objectives of the project included recruiting teachers to be participants, developing urban garden curricula, and implementing an immersive experience ILT.

## **Methods**

The Field of Hope staff conducted an urban farming teacher training in Lira, Uganda. The training took place over two days and included 29 secondary agriculture instructors. The trainers utilized an established urban farm to demonstrate and discuss topics such as: ideal varieties of crops, complementary livestock to raise, nursery bed/garden preparation and management, and product marketing.

Training took place during three sessions: the first session included a general overview of urban farming, the types of urban gardens, their establishing characteristics, the advantages and disadvantages of urban farming, opportunities in urban agriculture, tourism, employment for women and youth, and waste recycling; the second session focused on animal production in

urban agriculture, and livestock varieties ideal for urban farming such as swine, poultry, and zero-graze cattle and goats; the third session centered around marketing and the “4 P’s” that make up a typical marketing mix: price, product, promotion, and place, as well as additional “P’s”, like packaging, positioning, people, and even politics as vital mix elements.

### **Results and Conclusions**

The training resulted in 29 agriculture producers completing a two-day course over urban farming techniques and product marketing. Participants reflected on their experience by acknowledging the practice providing a new opportunity in limited space, ease of expenses, accessibility, knowledge and opportunity gain, and intent to begin their own urban garden.

Through this training, producers are empowered to increase production, even without large garden space. Participant V stated, “because urban farming is practiced within limited space, this can favor almost anybody who is willing to try it.”

Participant V continued to conclude that she found urban farming to be more accessible, both in labor and economically by stating, “urban farming is labor intensive since the small size limits mechanization, but this means it does not require the purchase of expensive machines, so every farmer can manage to maintain an urban garden.”

Additionally, she noted gaining more information and understanding. Participant V said, “this training has helped me gain a lot of knowledge and discover many opportunities around me in urban agriculture, including discovering sites for farming, what animals to rear on an urban farm, how to collaborate with my fellow urban farmers, and how to get a market for my products.” Participants anticipate not only using the new skills they were trained on themselves, but also to inform and empower others. A participant stated, “I will use the knowledge and skills obtained from this training to start up my own urban farm, which I will also use as a demonstration site to train other farmers. I will also use this knowledge to establish a school garden to teach learners practically and provide food to the school.”

This intent to share new practices is vital, as it contributes to the sustainability and growth of the training.

### **Recommendations and Educational Importance**

We know continued training for educators through experiential ILT makes positive impacts on the communities impacted by such teachers (Cannon, 2019). Due to the COVID-19 pandemic, an emerging need for urban agriculture production persists (Nicola, et al., 2020). Organizations, such as Field of Hope that provide agricultural training have proven to increase farmer knowledge, independence, and empowerment in terms of agricultural production (Wilcox, et al., 2021; Spence, 2020) Therefore, it is vital to support Ugandan communities through increased and varied agriculture training in new and innovative forms, such as urban gardening.

Participants of this training now have the opportunity to be change agents in their communities, and further spread knowledge, opportunities for improvement, and innovation through their network (McKnight, 2020). We know there are various and increasing populations even more in need of such innovation due to the COVID-19 pandemic (Nicola, et al., 2020). Therefore, we recommend firstly that like-organizations produce urban garden spaces in order to demonstrate the practices in training via experiential opportunities, and that such organizations begin or continue to host urban gardening training to smallholder farmers in similar populations. We also recommend research be conducted to discover the effectiveness of both the impact of this training on the trainee's gardening or farming practices, and also the effectiveness of the diffusion of innovation of this technology within their communities as a result of the training.

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## **Belief vs. Action: Analysis of General Global Knowledge and Global Citizenship**

Gary Wingenbach, Professor & Senior Scientist  
2116 TAMU, 261 AGLS Bldg.  
Texas A&M University  
College Station, TX, USA  
[gary.wingenbach@ag.tamu.edu](mailto:gary.wingenbach@ag.tamu.edu)

Alison Wooten, Graduate Research Assistant  
Department of Agricultural Leadership, Education, and Communications  
Texas A&M University

Keywords: Attitudes, Knowledge, Competencies, Global Citizenship

## **Belief vs. Action: Analysis of General Global Knowledge and Global Citizenship**

### **Introduction**

A review of most university mission statements reveals ideologies about high quality education that prepare students to become global citizens. Increased awareness and knowledge of world issues might promote improved attitudes about other cultures. Ideally, college students should be more knowledgeable about international agriculture because of its impact on supply, demand, and commodity prices (Francis et al., 2019). Realistically, students lack general knowledge of international agriculture. Morales et al. (2017) found students lacked general knowledge about international agriculture; only 4% passed a knowledge exam. However, those same students viewed themselves as open-minded members of a global community.

Future leaders should understand the interconnectedness of agricultural food systems to address future food security issues (Heinert & Roberts, 2016). Globalization issues should be included in post-secondary curricula to prepare students to participate fully in the ever-growing global market (Zuniga et al., 2015). Students will not understand diverse economies, cultures, and foreign agricultural practices without adequate knowledge of such systems (Francis et al., 2019).

### **Purpose and Objectives**

The purpose was to explore respondents' general knowledge of international agriculture and views about global citizenship. The research objectives were to; a) evaluate general knowledge of international agriculture, b) assess perceptions of global citizenship, and c) determine if differences existed in knowledge or perception when compared by selected demographics.

### **Methods**

A descriptive cross-sectional survey design was used. Quantitative dichotomous, categorical, and continuous data were collected. The target population represented students, faculty, and staff at a large southern U.S. land grant university in spring 2021. Total responses were 240, reduced to 184 (77% response rate) because of incomplete data. The research instrument consisted of 20 general knowledge questions, 20 statements about global citizenship, and eight demographic questions. To measure general knowledge of global agriculture, we modified previous versions of the International Agricultural Awareness and Understanding instrument developed by Wingenbach et al. (2003), modified by Hurst (2013), and Morales et al. (2017). General knowledge questions were presented with four response choices (one correct answer). Knowledge questions were a collection of topics that might be discussed or known throughout the university population.

The Global Citizenship Scale (GCS) developed by Morais and Ogden (2011) and modified by Morales et al. (2017) was used to measure perceptions of global citizenship. Respondents rated their perceptions of global citizenship using a 6-point Likert-type scale. Demographic questions were included on the variables of interest by group status, sex, race/ethnicity, and college. The final instrument quantified respondents' general knowledge of global agriculture, perceptions of global citizenship, and demographics. Data collection occurred through an online survey (Qualtrics) distributed in Spring 2021.



## **Results**

Participants (N = 184) were undergraduates (59%), female (55%), white (67%), who were in non-agriculture colleges (32%). Respondents' general knowledge of international agriculture averaged 9.28 out of 20 questions. Only 18% achieved a passing score. They strongly agreed with statements involving communicating with others, adapting behavior when interacting with other cultures, and expressing views about pressing global problems. They disagreed with social responsibility statements concerning global justice and disparities.

No significant differences were found in summed general knowledge or perceptions of global citizenship when compared by status, race, college, or sex. However, significant differences were found by group. Games-Howell post-hoc analyses showed graduate students rated the social responsibility statement, "I think people around the world get the punishment they deserve," significantly lower than did undergraduates. In terms of intercultural communications, graduates rated their abilities to adapt behaviors and communication styles when interacting with other cultures significantly better than did undergraduates. Faculty perceived themselves significantly more informed about current international issues than did undergraduates. Faculty members were significantly more likely to engage in a global humanitarian organization or project within six months than were undergraduates or staff. Graduate students were significantly more likely to work informally to solve a global humanitarian issue within six months than were staff.

## **Recommendations**

According to our results, less than 20% of undergraduates and only 25% of graduates achieved passing knowledge scores. About 33% of faculty and 20% of staff passed. If the university wants to develop globally competent students, faculty, and staff, then much work remains to support this goal at its most basic level of increased general knowledge of international issues. Clearly, more students must increase their general knowledge of international issues, but the same is true for post-secondary educators and staff. If we enliven our university missions and visions beyond mere words, then we deepen our commitment to learning about international issues, and in particular, agricultural issues that affect world food production, distribution, and consumption. More research is needed to determine truer measures of general international issues through specific coursework, campus activities, and/or international study/work abroad experiences.

The results showed that graduate students and faculty were more well-rounded global citizens than were undergraduates and staff. Graduate students were more open minded about social responsibility and were better intercultural communicators than were undergraduates. Would these results be consistent when comparing foreign vs. domestic participants? Research is needed with foreign vs. domestic post-secondary participants to isolate specific differences in the GCS attributes. Faculty were more informed about international issues (than were undergraduates) and were more likely to engage in global organizations or projects than were undergraduates and staff. Overall, undergraduates believed themselves to be globally competent, rating self-perceived attributes highly; but low ratings for active participation (i.e., global civic engagement) showed an unwillingness to put into practice those lofty self-perceived ideals.

Undergraduates and staff perceived a lack of accessible resources to become involved in international or humanitarian projects. However, campus-based "global civic engagement" events existed at the study site; participation at those events was low for most and non-existent for some (undergraduates and staff). The university and its faculty can do more to help others

make connections between mission statements and campus-based global civic engagement. Small steps will turn beliefs about global citizenship into active participation in local settings.

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## **The Contribution of Extension in the Improvement of Rural Livelihoods**

Evangelos Vergos<sup>1</sup>

Konstantinos Zoukidis

Marios Koutsoukos

Theodoros Blioukas

School of Professional Education, American Farm School, 57001 Thessaloniki, Greece

<sup>1</sup>Corresponding author: [vvergos@afs.edu.gr](mailto:vvergos@afs.edu.gr)

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# **The Contribution of Extension in the Improvement of Rural Livelihoods**

## **Introduction and Literature Review**

This review highlights the value of agricultural extension in promoting rural livelihood sustainability through operational production actions related to the agrifood chain in Greece. The American Farm School ([www.afs.edu.gr](http://www.afs.edu.gr)) has been engaged since 2013 in several projects related to experiential learning and consulting of farmers in synergy with companies of the agrifood sector within the Corporate Social Responsibility funding framework with the goal to upgrade farmers' knowledge and skills towards primary production optimization and environmental stewardship.

There are several emerging challenges for the efficiency of the agrifood sector worldwide. Agricultural extension can play a key role in enhancing contemporary primary production with environmental sustainability. Benefits arising from research dissemination, such as new and innovative knowledge and contemporary skills, have been impacted with modern technologies for broader outreach (Jones & Garforth, 1998; Garforth & Lawrence, 1997). As problems and challenges faced by farmers moderate over time, extension needs to change focus, structure, and approach in order to efficiently respond to complex issues (Swanson, 2008; Koutsouris, 2008; Leeuwis, 2004). Currently, extension has become more multidimensional than it used to be, as functions and tasks increasingly assumed by the agrifood industry and educational institutions have changed (FAO, 2013). In addition, the need of improved and expanded extension, together with an ongoing view of less public sector involvement in liberal economies has led to increasing private sector participation and the development of partnerships between the public sector, educational organizations, rural communities and private-sector providers (Feder et al., 2011; Rivera & Cary, 1997). In most cases, these partnerships take into consideration the input of both public and private sector, consider the present and future demands of society, and merge education, training, knowledge development and skill-enhancing techniques (Kirui & Kozicka, 2018). Thus, extension encompasses a wide range of synergies and activities organized to educate farmers, optimize productivity, improve rural livelihoods, and promote sustainability. In contemporary agrifood systems, it is acknowledged that these synergies strengthen cooperation and foster collaborative culture between stakeholders, increase farm productivity and reinforce sustainability.

## **Extension Applications and Data Sources**

Extension applications for contract farmers was initiated with Melissa-Kikizas Food Products S.A., Athenian Brewery, and McCain for durum wheat, barley and fresh potato production, respectively, while applications continued on behalf of Papastratos S.A. for eastern type tobacco, TUVUNU for herb mountain tea, Barba Stathis for fresh vegetables, DELTA Milk company and KDK Foundation for dairy cattle, sheep and beef cattle welfare and production management, respectively. The farms were geographically located in Thessaly, Macedonia, and Thrace. Program management conditions concern production and participants' level of education and personality showed significant qualitative variability. The general training curriculum pillars were adapted to meet the

needs of farmers and varied according to their specialized field of work. In addition, consulting in terms of efficiency took place throughout the calendar year and at times needed by farmers, so that the introduced activity to always match with the content of farm work.

In total, 1,880 adult farmers participated in the extension projects at the aforementioned areas attending 25h of experiential training and 216h of consulting by physical presence, except Covid pandemic period of March 2020 until July 2021 where training was done only online.

### **Economic, Social and Environmental Impact**

Feedback is an important mechanism in human learning and plays a significant role in shaping practices (Leeuwis, 2004). Giving farmers the opportunity to provide feedback to their extension provider increases satisfaction with and demand for the service both in current and following periods (Jones & Kondylis, 2016). Participants acknowledged that content of each project had a major positive impact on their *modus vivendi*, and subsequently, on their rural communities, providing significant economic, social, and environmental benefits. Their feedback was based on data collected from monitored rural households and in-depth interviews.

In particular, the economic benefits gained by participants were rural income enhancement, production cost reduction, promotion of rural entrepreneurship and rural poverty alleviation. As far as social benefits are concerned, extension contributed to population retention to rural areas, rural youth attraction to agriculture, socialization and interaction between rural people and promotion of collaboration culture among rural people. Finally, regarding environmental benefits, participants focused on adoption of sustainable soil management practices, rational use of inputs, and appropriate irrigation water management.

### **Discussion and Conclusions**

It is acknowledged that farmers to become *Stewards of the Land* should have characteristics of a good manager with contemporary knowledge, practical skills, and social responsibility. Consequently, extension to efficiently assist and contribute in the above notion must take a holistic approach, combining tailored contemporary theoretical knowledge with technical, business and social skills for economic development in rural areas (Lowitt, 2013; Kirui & Kozicka, 2018). To that effort, extension staff acted as “learning facilitators” rather than traditional “teachers,” ensuring participatory learning bearing in mind that knowledge transfer alone is not enough, as adults tend to integrate new knowledge into their preexisting practical knowledge status (Gordijn, van der Maden et al., 2017). Thus, interactive and participatory learning focused on “sowing the knowledge seeds” via experiential processes, practical examples and learning by doing paradigms, offering participants the ability to address challenges, introduce innovations in their own farms and produce long-term improvement in rural livelihoods (Garforth & Lawrence, 1997).

In rural societies over the last decade, there is a trend of investing in human capital, considering the significance of knowledge and skills as means of production (Kirui & Kozicka, 2018; Walker & Hofstetter, 2016; Jones, 2013). Along this line, extension is one of the most straightforward ways to enable the development of sustainability conditions in the countryside. To that effect, it was evident that philosophy governs entrepreneurship backstage as the driving force for the agrifood chain front line stakeholders. Requiring innovative new knowledge and skills to become more efficient and competitive in the field will improve living conditions with positive implications to rural societies.

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**Showing more than Telling: Pre-Vet Students' Photovoice Narratives from a Study**

**Abroad Course**

**José M. Uscanga**

Oklahoma State University

136 Agricultural Hall

Stillwater, OK 74078-6031

Tel. #: 405.744.5395

jose.uscanga@okstate.edu

**M. Craig Edwards**

Oklahoma State University

**J. Shane Robinson**

Oklahoma State University

**Robert Terry, Jr.**

Oklahoma State University

**Udaya DeSilva**

Oklahoma State University

**Keywords:** career aspirations, high-impact educational practice, Mexico, veterinary medicine

# **Showing more than Telling: Pre-Vet Students' Photovoice Narratives from a Study**

## **Abroad Course**

### **Introduction/Theoretical Framework**

Veterinary medicine generates more than 820,000 jobs with an annual contribution to the U.S. economy exceeding \$38 billion (Ouedraogo, 2018). Although always a demanding occupation, veterinarians have experienced rising rates of practice-related distress, job dissatisfaction, and suicide rates in recent years (National Research Council [NRC], 2013; Nett et al., 2015; Platt et al., 2012; Strand et al., 2005; Tomasi et al., 2019). Experts recommend that those seeking to join the profession have a broad understanding of its conditions (Association of American Veterinary Medical Colleges [AAVMC], 2019; Chan, 2019; Lau, 2018; NRC, 2013).

Thousands of applicants to schools of veterinary medicine in the United States graduate with pre-veterinary curriculum concentration options each year. These *pre-vet students* spend significant amounts of time, effort, and money trying to fulfill application requirements during college, but most will not gain admission (AAVMC, 2020; AAVMC & Dabdub, 2020). Therefore, opportunities to better understand veterinary medicine could save pre-vet students tangible and psychological investments, which may not only benefit them but also the veterinary profession. As such, studying abroad has been identified as a high-impact educational practice (HIEP) [Kuh, 2008] and “one of the most important experiences students can have during their undergraduate years” (Paige et al., 2009, p. 41). Geyer et al. (2017) concluded that short-term, study abroad courses have a positive impact on students' leadership and career development.

This investigation was undergirded by human capital theory (HCT) [Becker, 1962, 1994], interest-based motivation theory (IBMT) [Krapp et al., 1992], and person-environment fit (P-E. Fit) theory (Shen et al., 2003). This framework aimed to contextualize and explore the relevance

of a study abroad course on pre-vet students' understanding of the veterinary profession, including cross-cultural experiences and differences.

### **Purpose**

This qualitative study sought to describe pre-vet students' perceptions regarding the practice of veterinary medicine in Mexico, the influence of culture on such practice, the course's impact on their career aspirations, and Mexico's culture.

### **Methodology/Data Sources**

Photovoice, a qualitative research approach, was the data collection method. It involves photography that empowers people to express themselves more openly and more fully tell *their stories* (Delgado, 2015; Wang & Burris, 1997). A higher level of credibility can be expected in research involving photos compared with only words because photos are more about showing than telling (Delgado, 2015; Tracy, 2010). For instance, Uscanga et al. (2019) reported that photovoice allowed the researchers "to gain in-depth information from students who expressed in images what may have been difficult to explain in words" (p. 26).

Twenty-five undergraduate students from Oklahoma State University participated in a study abroad course tailored to veterinary medicine. The two-week-long, 2019 course's learning activities exposed students not only to hands-on learning experiences, tours, places of interest, and presentations but also to other veterinary students and practicing veterinarians from Oklahoma State University and Mexico. The course included unique aspects of veterinary practice in Mexico and Mexican society more widely. An assignment of 10 photos, and a written description of each, taken by the students while in Mexico, provided the investigation's data.

Word frequency analysis was conducted on the aggregated text of the photos' written descriptions, and the most frequently used words were noted. Textual analysis was done

using open, axial, and selective coding to evaluate the contextual relevance of these words or qualitative codes (Creswell & Poth, 2018). Significant statements were then identified and clustered into themes. A representative photograph and written description, with a range of supporting codes, helped to contextualize the emergent themes.

### **Results/Conclusions**

Two-thirds of the photographs and related written descriptions were associated with veterinary medicine, one-fourth to culture, and almost one-tenth were considered other related topics. Also, 328 significant statements emerged from the aggregated text of students' written descriptions of their photographs; 30 themes were derived from these statements. Nine themes related to the practice of veterinary medicine in Mexico, such as access to care, climate influence, comparison with the United States, and work settings for veterinary practice. Seven themes arose related to the influence of culture on the practice of veterinary medicine in Mexico, including animals for work, context-based welfare practice, and veterinarians' give-back to the community tradition, among others. Six themes were associated with the course's impact on students' career aspirations, e.g., broadening of career perspectives, learning of medical judgement, and learning on a range of veterinary procedures. And nine reflected on Mexico's culture, including socio-cultural comparisons with the United States.

Students perceived that veterinary medicine in Mexico was structured differently from the U.S. approach and the nation's socioeconomic and agroclimatology conditions impacted the delivery of animal care and affected veterinarians' work settings and practice. They also perceived that socio-cultural views about the purpose of animals were significantly different, and veterinary medicine and animal welfare were practiced in accord with such. In concert with the proposition of HCT (Becker, 1962, 1994), the course contributed to enhancing students'

understanding of veterinary medicine. Furthermore, students' interactions with the learning environment influenced their career aspirations, as postulated by IBMT (Krapp et al., 1992) and P-E Fit theory (Shen et al., 2003).

### **Recommendations, Educational Importance, Implications, and Application**

The students' abilities to conceptualize veterinary medicine in Mexico as a highly context-specific practice demonstrated the importance of providing them with an HIEP such as the study abroad course (Kuh, 2008). Students not only discerned the uniqueness of veterinary medicine in Mexico, but also distinguished some of its universal components (Geyer et al., 2017). As described by Sprecher (2004), "[v]eterinary medicine is at a crossroads" (p. 199). Moreover, nothing is more important than the individuals who seek to enter the profession, their career preparation and work performance, and their long-term personal satisfaction. Institutions of higher education should create or facilitate appropriate and timely learning opportunities for students to fully understand their interests in the veterinary profession while undergraduates. Other investigations should also seek to determine factors likely to influence pre-vet students' understanding of the profession, including its opportunities and challenges.

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**Empowering Women through Artisan Cooperatives in Sub-Saharan Africa**

Garrett S. Brogan

600 John Kimbrough Blvd

Suite 270

College Station, TX 77843-2116

gsbrogan@tamu.edu

Department of Agricultural Leadership Education and Communications

Texas A&M University

Dr. Kim Dooley, Texas A&M University

**Keywords:** women cooperatives, women empowerment, artisan sector, social enterprises

# **Empowering Women through Artisan Cooperatives in Sub-Saharan Africa**

## **Introduction**

Research has indicated women feel a sense of empowerment as they collaborate with others via a cooperative or group for work (Dol & Odame, 2013; Dooley et al., 2020; Ferguson & Kepe, 2011; Lecoutere, 2017; Meinzen-Dick et al., 2011). Most research with women is focused on sustenance farming. There remains little research on the informal sector and how cooperatives impact women empowerment. One area developing countries have a comparative advantage in is the artisan sector (Indego Africa, n.d.). Cooperatives contribute to the African economy by generating employment, leading to more significant development and in some countries a large percentage of the population earn their livelihoods from being a part of a cooperative (Kwakyewah, 2016; Mhembwe & Dube, 2017).

Through economic enterprises, women can gain access to resources, training, and funding that enables them to break cultural norms to transform society (Dooley et al., 2020; Ferguson & Kepe, 2011; Lecoutere, 2017; Meinzen-Dick et al., 2011). Women gain confidence and grow together which increases their sense of self-efficacy and enables them to make choices to empower themselves and their communities (Malhotra et al., 2002).

## **Theoretical Framework**

Three theories were used to frame this study: Social capital, Economic Modernity, and Rowlands' empowerment model.

Social capital is used across the social science discipline, and many people are drawn to it because of its connections between sociology and economics (Claridge, 2014). Woolock and Narayan (2000) define Social Capital theory through four views: (a) communitarian view, (b) the networks view, (c) the institutional view, and (d) the synergy view. This study focused on using the first two views, communitarian and networks, to understand these women's development in these artisan cooperatives.

Economic Modernity: The Classical Development Perspective (EMCDP) focuses on the aspect that economic development is key to increasing democracy and human choice (Alexander & Welzel, n.d.) As economic development opportunities arise for women through education, occupations, and positions of social power, they become empowered.

Rowlands (1997) evaluated women empowerment through three dimensions: personal, relational (group), and collective (societal or community).

All three theories come together to help understand if women experience empowerment.

## **Purpose and Objectives**

The study sought to understand what impacts an artisan cooperative has upon craftswomen through Social Capital, EMCDP, and Rowlands's framework. The three objectives were: (a) explore the social connections of an artisan cooperative; (b) determine the networks that exist

within an artisan cooperative and what types of networks create opportunities for social and economic benefits for craftswomen and (c) explain how the participant's democracy and human choice have been impacted by their economic gain from the cooperative.

## **Methods**

Phenomenological studies explore lived experiences and seek to understand a person's experience from their point of view (Merriam & Tisdell, 2016; Seidman, 2013). This study interviewed CEOs of artisan cooperatives and social enterprises located in Sub-Saharan Africa via Zoom. Documents were analyzed from the cooperatives to triangulate the cooperative's current projects and happenings. Documents analyzed were yearly reports, blog postings, and current news updates from the cooperatives. Theoretical triangulation was used to describe the themes.

## **Results and Conclusions**

The interview data described what participants were like before joining the cooperative, and observable changes over time. The data was compiled into four themes: (a) structure of cooperatives, (b) key partnerships, (c) growth and change experienced, and (d) benefits of the cooperative.

### **Structure of Cooperatives**

The variation of how the cooperatives began is important to provide the context of the experience. One cooperative had been a non-profit entity but was defined as a social enterprise, where the women work and produce artisan goods while being educated and saving up to start a business of their own. All cooperatives are trying to make profits by selling the artisan products craftswomen are producing, while also promoting child tuition sponsorships, relying upon donations, developing educational programs, and partnering with other nonprofits.

### **Key Partnerships**

Many of the original partnerships started when the CEOs partnered with working artisans. Those partnerships continued to grow through CEOs finding retail stores or white labels to sell products. Partnerships formed in finding inputs for artisan crafts, with governments in the country, the local communities the craftswomen work in, and non-profits working in the area.

### **Benefits or Impacts of the Cooperative**

Craftswomen were bringing in a consistent income which enabled them to afford a more diverse diet, pay for transportation, and increase their standard of living. Many of the craftswomen became the sole provider of income in their households. The craftswomen could afford to send children to school, pay for medical emergencies, and start a savings account. Some of the craftswomen saved money to add additions to their homes, go on trips, or purchase items to enhance their own skills and hobbies.

All cooperatives provided educational programs for the craftswomen, covering topics such as financial literacy, running a business, nutrition, and health, and English literacy. The

craftswomen saw the cooperative as a place to collaborate and grow together as colleagues and friends. The environment allowed them to share common concerns, issues, and successes.

### **Change and Growth**

Many participants lacked basic skills such as using scissors, measuring products, and how to mail a letter. The craftswomen begin to use critical thinking skills to accomplish tasks and reach goals. Many stepped up into positions of leadership. The craftswomen's new sense of confidence helped them express interest in local and global social issues. The craftswomen not only were being empowered through the cooperative, but empowering other women through employment, education, and being an advocate.

### **Educational Importance and Implications**

Many of the CEO's brought the network's view to these women participating in these artisan cooperatives (Woolock & Narayan, 2000). They connected them to international markets, educational opportunities, economic gain, and training. The economic development empowered them to make changes in their homes, communities, and nations (Alexander & Welzel, n.d.). Future research is needed to investigate empowerment from the women's perspective. Practitioners may also investigate future market opportunities to connect these cooperatives to larger trade opportunities.

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A Call for a Paradigm Shift Towards Systems Thinking: A Needed Change for Practitioners of  
Agricultural and Extension Education

Katrina R. Alford  
University of Florida  
305 Rolfs Hall, PO Box 110540  
Gainesville, FL 32611  
[trini@ufl.edu](mailto:trini@ufl.edu)

T. Grady Roberts  
University of Florida

Keywords: Systems thinking, hard systems thinking, soft systems thinking, systems thinking  
paradigm



## **Introduction and Theoretical Framework**

The world's challenge is that the current food system will need to produce 50% more food to meet the projected population growth (Food and Agriculture Organization [FAO], 2018). Both climate and non-climate stressors must be addressed to achieve worldwide food security (Mbow et al., 2019). Examining issues facing the agricultural, food, and natural resources (AFNR) industries requires social and technical knowledge. Additionally, social complexity, coupled with the technical difficulties of problems creates wicked problems (Camillus, 2008).

According to Rittel and Weber (1973), wicked problems are issues where an individual needs to understand the problem before attempting to solve it because the understanding and resolution of the problem are concurrent. The social complexity of various stakeholders' interests and values, coupled with institutional complexity and scientific uncertainty, contributes to wicked problems (Head & Alford, 2013) and makes it difficult to find any optimum situation that satisfies all involved (Checkland, 1985). Wicked problems transcend political boundaries and cross beyond disciplinary silos. Consequently, international agricultural and extension educators must navigate this context of ambiguity and complexity to address the wicked problems facing the AFNR industry.

Those involved in agricultural and extension education need to create environments that encourage deeper engagement with complex social subjects and therefore need to nurture this ability within themselves. Systems thinking has emerged as a model for thinking differently (Cabrera et al., 2008) and proposed a solution to tackling issues of complexity (Plate, 2010). As the AFNR industry faces multiple wicked problems, systems thinking may need to become more prominent. However, there is a lack of discussion regarding the role of systems thinking within ANFR.

### **Purpose**

Systems thinking has been well documented in various disciplines. However, a literature review shows a lack of research within AFNR. This paper aimed to synthesize systems thinking theory and presents a system thinking model appropriate for international agricultural and extension.

### **Theoretical Themes**

Systems thinking is conceptualized as looking at interrelationships between parts related to the whole (Trochim et al., 2006). Ison (2008) wrote that many people have some level of awareness of the interconnected nature of systems. As such, systems thinking was initially conceived "as a set of interacting or interdependent parts forming a complex whole" (Stalter et al., 2016, p. 324). Arnold and Wade (2015) define systems thinking as "a set of synergistic analytic skills used to improve the capability of identifying and understanding systems, predicting their behaviors and devising modifications to them to produce desired effects" (p. 675). For this paper, this definition will be utilized to operationalize systems thinking.

Despite the varying definitions of systems thinking, a key element is the understanding that the sum is more than the parts (Bawden et al., 1984). Individuals who are systems thinkers are aware of the interconnections that make up a holistic view, as opposed to systematic individuals who utilize a step-by-step [linear] approach (Ison, 2008). Ison (2008) argues that most people naturally have some degree of systemic and holistic thinking. However, Kali et al. (2003) found "that general awareness of the holistic aspect of a system does not necessarily foster systems thinking" (p. 563).

Checkland (2005) distinguished between two types of systems thinking: hard and soft. The foundation for hard systems thinking (HST) rests on positivism to solve well-defined problems (Zexian & Xuhui, 2010). However, as Rittel and Webber (1973) noted, the paradigm of science and engineering (i.e., positivism), which underlies most professions, cannot be applied to open societal problems. The social reality was not reflective of the testable physical reality, and as such, systems thinking needed to evolve to address this disconnect (Checkland, 1981). Soft systems thinking (SST) was developed to address the interpretive element of human activity (Zexian & Xuhui, 2010). Ison (2008) writes that soft systems thinking involves an epistemological shift in which systems are no longer based on models but rather a deeper understanding of a phenomenon.

Hung (2008) writes that systems thinking is one of the most complex higher-order thinking and is often challenging to master. Bawden (1991) argued that agriculturalists need to build a paradigm appropriate for the magnitude of the problem being studied within the context of agriculture. A systems thinking paradigm involves a worldview that allows an individual to address the social and natural world (Randle & Stroink, 2018). International agricultural and extension educators often operate in problems involving both the technical and social reality. Therefore, they need to develop HST and SST competencies. The development of these competencies is necessary to develop a systems thinking paradigm that can address wicked problems.

### **Conclusions**

West et al. (2014) note that a holistic approach is needed to address food security and environmental sustainability. However, this holistic approach involves complex cognitive abilities, contrary to humans' natural inclination to approach problems linearly (de Langhe et al., 2017). Systems thinking is a crucial higher-order thinking skill needed to solve complex problems (Akcaoglu & Green, 2018). Systems awareness, once realized, can serve as a foundation for transformational experiences designed to promote systems thinking skills. As individuals reflect on these experiences, they further develop their systems thinking competencies. Over time, this progression can grow into a systems thinking paradigm. Yet, there has been a lack of progress within the AFNR industry regarding a shift towards systems thinking (Bawden, 1991). To better prepare international agricultural and extension educators, further research should be conducted on this phenomenon.

### **Recommendations**

It is recommended that international agricultural and extension educators examine their own thinking to determine to what extent they are utilizing systems thinking within their programs. This information could be utilized to structure personal and professional growth experiences to assist educators and extensionists in developing their own systems thinking paradigm and how to best incorporate into their programs. In addition, further research should be conducted to determine if Checkland's (2005) delineation of hard and soft systems thinking is a comprehensive picture of the different types of systems thinking. This information may help create a starting point to open dialogue about systems thinking among the various actors within agriculture.

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## **Empowering Ugandan Youth in the Groundnut Value Chain using Photovoice**

Annie Carter<sup>\*1</sup>, Tom Gill<sup>1</sup>, David R. Ader<sup>1</sup>, Carrie A. Stephens<sup>1</sup>, Archileo Kaaya<sup>2</sup>, Stephen Lwasa<sup>2</sup>, David Musoke<sup>2</sup>, Daisy Kemigisha<sup>2</sup>, Ruth Martha Mirembe<sup>2</sup>, David Okello<sup>3</sup>

<sup>\*</sup>Smith Center for International Sustainable Agriculture, University of Tennessee, 2640 Morgan Circle Drive, Knoxville, TN 37996. [acarte75@vols.utk.edu](mailto:acarte75@vols.utk.edu)

<sup>1</sup>University of Tennessee, Knoxville, USA

<sup>2</sup>Makerere University, Uganda

<sup>3</sup>National Agricultural Research Organisation (NARO), Uganda

**Keywords: peanuts, Africa, visual methods, agriculture, ICT, leadership**

### **Introduction**

In regions of East Africa, groundnut (*Arachis hypogaea* L.) is cultivated as a common cash crop in areas of food insecurity and agricultural-dependent communities (Thuo et al., 2013).

Groundnut, also known as peanut, is a legume with a variety of important uses. Most importantly, it serves as a protein-rich resource for humans and livestock (Singh & Diwakar,

1993). In Uganda, groundnut is the second most important legume in terms of volume of production (Okello et al., 2010). In 2019, Uganda produced approximately 5000 kg/ha of groundnuts on 32,000 hectares of land (FAO, 2019). This crop is especially popular with subsistence farmers, who seek to harvest a crop which is affordable.

With the majority of the Ugandan population under the age of 30, youth are key to the future of the agricultural economy. Youth is defined as “the period of transition from childhood to adulthood” (Yami et al., 2019, p. 1). With an estimated 440 million young people expected to join the global labor market by 2030, home location has created a disadvantage when searching for gainful job opportunities (Yami et al., 2019). Half of Ugandan youth currently work in or around an agriculturally related field, but this number is declining despite increasing youth unemployment rates (Ahaibwe et al., 2013).

## **Objectives**

The objectives of this study were to 1) assess rural youth empowerment in the Ugandan groundnut value chain, and 2) document and identify youth empowerment of the Ugandan groundnut value chain by utilizing participatory mapping and photovoice methodologies.

## **Methods**

For our research study, we distributed pre-surveys in December 2020 to 60 participants in two Ugandan districts: Tororo and Nwoya. These districts were selected based on their different agroecology and socio-demographics, while also being two of the highest producing districts for groundnuts in the country. The pre-surveys contained empowerment scales used to gauge the thoughts and feelings of youth participants involved in the groundnut value chain. The categories included in the empowerment scales were as follows: Goal Orientation, Hope, Life Satisfaction, Environmental Stewardship, Entrepreneurship, Diligence and Reliability and Altruism.

We used a two group study design of 30 participants in each group. All participants (hence, both the control and treatment group) were trained in participatory mapping in December 2020, and then we randomly selected half of the participants to be in the treatment group. Those in the treatment group were trained and have been participating in a participatory visual methodology, photovoice, over the 12-month period of December 2020 - December 2021. Those trained in photovoice were equipped with 30 mobile phones to capture photos of the groundnut value chain. Project team members have traveled to Nwoya and Tororo districts three times thus far. During these visits, the team has collected photos taken by participants and conducted focus groups to discuss the participant photos and understand how the photos articulate a variety of issues related to engagement in the groundnut value chain. Photos collected have been coded and categorized. Codes ranged from production to transportation and consumption. At the end of the project, our team will travel to the districts to conduct final focus groups and distribute post surveys to the original 60 participants.

Due to COVID-19 pandemic, photo collection has been interrupted at various times, including during the Ugandan lockdown from mid-June to late July 2021. However, one advantage to the photovoice approach has been that participants have still been able to capture photographs around their districts throughout the changing nature of movement restrictions due to COVID-19. Three more follow-ups are planned with the participants before the project is completed.

## **Results**

Findings from the youth surveys and the photovoice methods have provided the research team an opportunity to collectively evaluate youth empowerment within the groundnut value chain in Uganda. Forty-four percent of the participants are currently involved in groundnut production, while 96% of participants live in a household where parents or older adults are involved in agriculture. Both men and women were almost equally involved in some level of groundnut production. Education levels varied between participants, but in each district most ended their education at the secondary level and fewer reached the collegiate level.

On average, our 30 treatment group participants averaged 30 photos submitted from the first visit to the field and 20 from the second visit. The majority of photos collected have been coded as *production*; however, we anticipated this at the beginning of our study because of the time of the year. In time, we expect photos submitted will change as youth capture pre- and post-production elements of the value chain.

Our findings highlight the importance of women in the groundnut value chain. Most photos displayed images of women doing physical labor alongside small children. Family units are the main form of production labor, although some community groups travel together from farm to farm to weed garden plots in the district. By the time of the AIAEE conference in April, we will have finished data collection and expect to have more results to present.

## **Recommendations/Educational Importance**

Employing a photovoice methodology with youth is a novel form of research for assessing empowerment in an agricultural value chain. This process has already empowered youth participants, who proudly discuss their photos within the focus groups and also in the community. With youth being increasingly integrated into a digital global society, whilst agriculture remains the backbone of many emerging economies, there is a pressing need to understand the role of information and communication technologies in empowering and engaging youth in agriculture. In order to generate a deeper understanding of the benefits of using photovoice to empower youth in agriculture, we recommend that further research employ photovoice and related approaches across other agricultural value chains.

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**A Fissure in Focus? Stakeholders' perceptions of needs and priorities at local, state, national, and international levels**

Lauri M. Baker: Department of Agricultural Education and Communication; Center for Public Issues Education in Agriculture and Natural Resources, University of Florida

1408 Sabal Palm Drive, Second Floor, #107  
Center for Public Issues Education in Agriculture and Natural Resources  
University of Florida  
Gainesville, FL 32611  
Lauri.m.baker@ufl.edu

Anissa M. Zagonel: Center for Public Issues Education in Agriculture and Natural Resources, University of Florida

Ricky Telg: Department of Agricultural Education and Communication; Center for Public Issues Education in Agriculture and Natural Resources, University of Florida

Keywords: focus groups, agriculture, Extension, international, local

Oral Presentation **or** Poster Presentation

## **Abstract**

### **A Fissure in Focus? Stakeholders' perceptions of needs and priorities at local, state, national, and international levels**

#### **Introduction**

Academia, and Extension by its connection to universities, has become more global in its activities. Land-grant institutions strive to be a go-to source for teaching, research, and outreach (Thomas & Jackson, 2004). Extension was created to connect the people of the state with information (Rasmussen, 1989), but that task can be made difficult by the need to please multiple governing sectors (Rivera, 2008). How an institution balances the local needs of stakeholders with the pursuit of national and international recognition has proven challenging (Lo & Hou, 2020; Martin & O'Brien, 2011; Rivera, 2008) now more than ever with globalized information (Thomas & Jackson, 2004).

An assessment of these balances often occurs within organizations as a benchmark for strategic planning (Romaniuk & Gaillard, 2007). It is imperative that stakeholders and organizations understand, respect, and see value in the other entities, even if the other's purpose does not align with its own. Without this mutual appreciation, difficulties may arise leading to negative impacts for the organization (Martin & O'Brien, 2011).

#### **Purpose and Objectives**

The purpose of this study was to understand the perspectives of stakeholders about the [University] and its Extension activities.

#### **Methods**

To address the study purpose, a series of six virtual focus groups were conducted between April 20 and June 3, 2021. Participants were invited from a list of approximately 130 [University] stakeholders identified by the associate vice president for operations and dean of Extension. The final group who agreed to participate comprised of 45 association leaders, producers who represented all aspects of the state's agriculture and natural resource sectors, and community leaders. Focus groups ranged from five to nine participants in each group.

The research team developed a moderator's guide, and it was reviewed by a panel of experts prior to implementation. Questions used to fulfill the purpose of this study were related to the balance of the Extension/University focus in providing support to its different stakeholders and where participants thought the Extension/University should be in the next 10 years. Both questions were asked with a local, statewide, nationwide, international, and industry level focus. At the end of each focus group discussion, the moderator provided a recap of the conversations to confirm the accuracy of summary. The note taker provided notes to correspond with the audio recordings of the focus groups; this audit trail lends validity to this study (Flick, 2009).

Data analysis was guided by Glaser's (1965) constant comparative method and open coding to identify major themes. After major themes were identified, all note takers, moderators, and assistant moderators were asked to review the themes to confirm these were an accurate reflection of the data.

## Results

### **Theme 1: Responsibility and Profitability of Agriculture and Natural Resources**

When asked about the needs and priorities for the university, college, and Extension, participants felt the college and Extension had a direct role and responsibility for the profitability of agricultural sectors in the state. This theme appeared in four out of six focus groups and was identified 17 times throughout all focus groups. Many noted that the college and Extension system should support the agricultural “economic engine” to keep the state going through fully staffed research centers, Extension offices, and education.

- “You could talk for days about either teaching, research, or extension. Holistically and together and in a very simple statement, they should be working to ensure profitability of all their stakeholders, especially agriculture.”
- “I would just add that the work done by all three segments of Extension, teaching, and research just basically undergird the foundation of the economic engine of all commodity groups across the state.”
- “I think it's important, it's incumbent, upon us to remember that the [University] [college and Extension] has to be about service, and the people who pay for the university have to recognize the service and have to come to value it or it won't be any longer.

### **Theme 2: Too Much Focus on National and International Recognition**

This theme was present in two of the six focus groups and was identified nine times in all focus groups. Stakeholders felt the [University] and by association the college were more concerned with the pursuit in becoming a nationally recognized, top-ranked university, rather than serving the state, its industries, and its people.

- “From an outsider looking in, it’s almost just for the benefit of the [University]. If they can tout themselves around the country saying, ‘Look at what we’ve done. Look at what we’ve done,’ and doing so it’s at the cost and detriment of agriculture in the [State].”
- “It does feel like we’re forgotten when I constantly see the [University] fighting and asking for money to help get to be a top national university.”
- “I think the strategic plan for the [University] is for it to be recognized nationally and internationally at a higher level than it is now and that's all well and good, as long as it's about service and it's about excellence in research, extension, and teaching. As long as we can keep that, I think in 10 years we'll be of great benefit to the citizens of the state especially.”

## **Discussion, Recommendations, and Implications**

As universities and Extension systems continue to grow in global work, the needs of stakeholders must continually be evaluated (Romaniuk & Gaillard, 2007) and remain a focus of the land-grant mission. But international and national work are a standard for operating in the 2020s, and this research confirms that the balance between international/national work and local/state work is difficult to maintain in the eyes of stakeholders (Lo & Hou, 2020; Martin & O'Brien, 2011; Rivera, 2008). Implications from this work are a need for university and

Extension systems to develop messaging and branding related to the “why” behind international and national recognition. Stakeholders need to understand the benefits of national/international work to local/state communities, because if stakeholders do not share the values of the work, they will not support the mission, vision, and long-term success of the organization (Martin & O’Brien, 2011).

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# Nonprofit Organizations' Volunteer Retention During the COVID-19 Pandemic

Suzanna Windon Ph.D.<sup>1</sup>

Daniel Robotham<sup>2</sup>

Ann Echols Ph.D.<sup>3</sup>

<sup>1</sup>*The Pennsylvania State University*

*Mailing Address: 209B Ferguson Building University Park, PA 16802*

*Email: [sxk75@psu.edu](mailto:sxk75@psu.edu)*

<sup>2</sup>*The Pennsylvania State University*

<sup>3</sup>*Volunteers Centre County, Non-profit Organization*

**Keywords:** Volunteer management practices, organizational response to the COVID-19 pandemic, satisfaction with organizational retention of volunteers, nonprofit leaders

## Introduction and Review of the Literature

Globally, nonprofit organizations have seen the demand for their services dramatically increase but uncertainties about health and safety have caused many volunteers to reduce their hours or stop volunteering (Fidelity Charitable, 2020). In 2018, the United Nations estimated that over a billion people around the world did volunteer work (United Nations Volunteers Programme, 2018), however, this number decreased significantly by 2020 (International Labour Organization, 2020) in large part due to the COVID-19 pandemic. Many nonprofit organizations, to reduce operational costs, rely on volunteers to play significant roles. One of the major costs to nonprofit organizations is volunteer recruitment and training (Handy & Srinivasan, 2004). By effectively managing and retaining existing volunteers, nonprofits can improve programs and services. Because of this, nonprofits consistently look for ways to improve volunteer retention (Waters & Bortree, 2012).

Specific volunteer management practices including volunteer recognition, training, screening, and task matching significantly correlated with improved volunteer retention (Al Mutawa, 2015; Hager & Brudney, 2004). Similarly, the organizational response has long been associated with organizational resilience and specific research indicates organizational response mitigates the effects of the COVID-19 pandemic on volunteer retention (Kim & Mason, 2020). As organizations look for answers to surviving the pandemic, these relationships merit further study.

## Purpose and Objectives

The purpose of the study was to assess perceptions of organizational retention of existing volunteers during a pandemic among local nonprofit organization leaders and explore the

relationship between organizational retention and volunteer management practices. The study research objectives were to describe the *Importance of Volunteer Management Practices*, *Organizational Response to the COVID-19 Pandemic*, and *Satisfaction with Organizational Retention of Volunteers During the COVID-19 Pandemic*; and to describe to what extent *Satisfaction with Organizational Retention of Volunteers During the COVID-19 Pandemic* can be explained by *Importance of Volunteer Management Practices* and *Organizational Response to the COVID-19 Pandemic*.

## Method

We used an online questionnaire administered via Qualtrics to explore local nonprofit organizations' leaders' perceptions of their organizational satisfaction with retention, the importance of specific volunteer management practices, and the organizational response to the pandemic.

We identified nonprofit organizations in Centre County, Pennsylvania, and the names of Board Presidents, executive directors, and/or key leaders on each organization's website. We invited nonprofit organizations' leaders (N = 696) to participate in our study through email and sent four reminders (Dillman, et al. 2014). Data collection occurred during the Spring of 2021. We had a useable response rate of 10.6% (N = 74).

We developed a one-item retention variable called: *Satisfaction with Organizational Retention of Volunteers During the COVID-19 Pandemic*. This variable was measured on a five-point Likert scale, with 1 meaning not at all satisfied, 2, slightly satisfied, 3, moderately satisfied, 4, very satisfied, and 5, extremely satisfied. We adapted items derived from both ISOTURE and GEMS models (Boyce, 1971; Culp et al., 1998) to create the nine-item *Importance of Volunteer Management Practices* variable, measured on a five-point Likert scale, with 1 meaning not at all important, 2, slightly important, 3, moderately important, 4, very important, and 5, extremely important.

To measure "*Organizational Response to the COVID-19 Pandemic*," we adapted Roger's theory of innovation model to one survey question "*Which of the following best represents your organization's response to the COVID-19 pandemic?*" The five response options were measured using a 5-point scale: 1 meant the organization proactively acted to address the situation ahead of time, 2 meant the organization actively collected external data and reacted promptly, 3 meant the organization waited on others' early success stories before reacting, 4 meant the organization was reluctant to react and waited for the majority to react before it acted, and 5 meant the organization was skeptical and one of the last to react.

## Results

With respect to the first research objective, the mean summative score for *Importance of Volunteer Management Practices* was 3.52 ( $SD = .96$ ,  $n = 74$ ), and for *Satisfaction with Organizational Retention of Volunteers During the COVID-19 Pandemic*, 3.50 ( $S.D. = .98$ ). Approximately 51 % of participants indicated that they were very and/or extremely satisfied with their organization's retention of existing volunteers.

Regarding the second research objective, the application of the Pearson Correlation Coefficient (Freedman, 2007) showed a significantly low negative association between *Satisfaction with Organizational Retention of Volunteers During the COVID-19 Pandemic* and *Organizational Response to the COVID-19 Pandemic* ( $r = -.28, p = .011$ ). The correlation between *Satisfaction with Organizational Retention of Volunteers During the COVID-19 Pandemic* and the *Importance of Volunteer Management Practices* was not significant. A multiple linear regression model was conducted to determine the relationship between our dependent variable – *Satisfaction with Organizational Retention of Volunteers During the COVID-19 Pandemic*, and *Importance of Volunteer Management Practices* while controlling for *Organizational Response to the COVID-19 Pandemic*. The results indicated that a significant proportion of the total variance in *Satisfaction with Organizational Retention of Volunteers During the COVID-19 Pandemic* was not predicted by *Importance of Volunteer Management Practices* ( $F(1, 63) = 1.592, p = 0.212$ ).

## Implications and Recommendations

This study extends previous that "best" volunteer management practices are generally commendable but, during a crisis, such as a global pandemic, these practices are not as valuable to an organization's ability to retain existing volunteers compared with the value gleaned from being an early, proactive responder to the crisis. The ongoing global uncertainty and changing conditions will likely continue to require nonprofit organizations to adapt and adjust. Nonprofit organizations looking to retain volunteers should recognize it is not sufficient to rely on simply doing "best" volunteer management practices to retain volunteers during a crisis like the COVID-19 pandemic; it is critical that they act decisively to retain their volunteers. To better understand the importance of organizational response in volunteer retention, further research should seek to examine the impact of organizational response under different cultural and environmental conditions. Having Extension leadership and volunteer management educators and scholars working collaboratively in both research and leadership change-education initiatives, by offering other professional development opportunities, not only provides shared learning but also informs future research needed to advance our understanding.

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**Assessing the impact of parental involvement on the scaling of agricultural technologies from school garden to home farm through experiential learning**

Gracie Pekarcik  
The University of Tennessee, Knoxville  
101 McCord Hall, 2640 Morgan Circle Dr.  
Knoxville, TN 37996  
[gpekarci@vols.utk.edu](mailto:gpekarci@vols.utk.edu)

David Ader  
The University of Tennessee, Knoxville

Key words: education, scaling, parents, garden, agriculture

## Abstract

### Introduction

Cambodia is currently undergoing rapid economic and social changes as the young population moves beyond decades of war and tragedy and transitions to more democratic institutions and free market policies. Although strides have been made to reduce poverty and strengthen the country's economy, the nation remains predominantly rural with a heavy dependence on agriculture, particularly smallholder rice farming systems (Ran et al., 2013). Furthermore, starvation, hard labor, knowledge destruction, and summary execution during the reign of Khmer Rouge in the 1970s resulted in a desimated education system characterized by minimal content and pedagogy knowledge (Islam et al., 2017).

S3-Cambodia, a 3-year project (2020-2023) funded by the US Agency for International Development (USAID) Feed the Future Sustainable Intensification Innovation lab (SIIL), seeks to examine pathways for scaling suitable and sustainable technologies for smallholder, rice-based farmers. One of the key identified pathways to scaling is through the education system. Cambodian youth serve as an entry point to extend target technologies to farm families through experiential learning opportunities in schools by establishing "green labs", featuring school gardens.

School gardens are an established instructional tool to deliver agricultural education and food system training within primary and secondary schools worldwide. They provide a pathway to evaluate new technologies without personal risk and a knowledge base from which to share new information (Shilomboleni & De Plaen, 2019). In a comprehensive literature review of school gardens as a method for scaling SI technologies, inclusion of parents in the learning process and upkeep of school gardens was found to be a key component in assuring a successful and scalable school garden (Pekarcik & Ader, 2021). Active parental involvement significantly increased the likelihood of knowledge transfer from students to parents.

This research study seeks to support the desired outcomes of the S3-Cambodia project by assessing parental perceptions of their involvement in their children's lives and schools. While students have significant potential to be agents of change in their homes and communities, there is a need to determine if school-child-parent relationships in Cambodia are strong enough to facilitate this knowledge transfer.

### Purpose and objectives

The purpose of this study is to determine the extent and means by which Cambodian parents are involved in their children's lives and school activities. Objectives are as follows:

1. To assess current perceptions of parental involvement in educational activities at Sor Kheng Kanteu II High School, Hun Sen Phnom Sampov High School, and Rongko High School
2. To document current adoption of classroom-based knowledge, attitudes, and practices at parents' homes related to SI technologies
3. To determine parents' perceived willingness to learn about new agricultural technologies from their child(ren)
4. To evaluate the feasibility of using school facilities and instruction as a pathway to scaling agricultural technologies

## **Methods**

Primary data was collected from households whose children attend three separate high schools in three provinces of Cambodia through one-on-one orally conducted surveys. Schools included Sor Kheng Kanteu II High School, with no agricultural program, Rongko High School, with a technology park program, and Hun Sen Phnom Sampov High School, with a school garden program. Survey questions measured parents' perceptions of their current involvement in educational activities at their child's school and their perceived communicational levels with their child. Additional questions sought to document parental adoption of classroom-based SI knowledge and evaluate the feasibility of implementation or scaling up a school garden. The survey instrument included a separate annex of questions for each school based on the agricultural education programming, or lack thereof, available at the school. Each brief annex addressed a different element of understanding parental relationships to school gardens, moving from broad to specific. Doing so reflects the stages of green lab development through S3-Cambodia from assessment (Sor Kheng) to implementation (Rongko) to evaluation (Sampov). Comparing the results of the survey across the three schools provides insights for how to strengthen S3-Cambodia's existing and planned green labs at secondary schools in Cambodia. Data is to be evaluated through an SPSS analysis of survey responses and an NVivo analysis of key informant interview responses.

## **Results**

At the time of this abstract submission, analysis of data is ongoing. We expect to have results and analysis finalized prior to the outset of the conference. Preliminary results suggest that parents' perceived involvement in their children's schools and lives vary between regions. Parents of students at Rongko High School are more likely to be involved in their children's lives and schools than parents at the two other schools. A potential reason for this is that Banteay Meanchey province is located in a highly rural region, as opposed to the more urban areas of Battambang province where the other schools are located. The rurality of the school and households may influence family social ties and parents' proximity to the school, making agriculture programming more accessible. Furthermore, preliminary data suggests that the existence of agriculture-based programming (i.e. technology park, school garden) in Cambodian high schools positively influences parents' adoption of new agriculture technologies. Finally, data suggest that parents have a strong interest in school garden implementation and activities at their children's schools.

## **Educational importance and implications**

Findings are significant to the establishment of S3-Cambodia school gardens and the body of research on scaling through education. Foremost, in the scheme of the whole S3-Cambodia project, this research will provide baseline data from which later stages of the project can measure actual transfer of knowledge of SI technologies from school to household. The presence, or lack thereof, of parent-child-school relationships in different regions of Cambodia will affect how project members go about implementing and monitoring a green lab. In addition, this research will add to knowledge on scaling through education in Cambodia, of which very little currently exists.

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## **Lessons Learned from a Tailored Evaluation Capacity Building Initiative in Extension**

**Narine, Lendel K.**

Extension Assistant Professor and Evaluation Specialist

Utah State University

4900 Old Main Hill

Logan, UT 84322

[lendel.narine@usu.edu](mailto:lendel.narine@usu.edu)

**Ali, Amanda D.**

Data Scientist

Rural Online Initiative

Utah State University Extension

***Keywords:*** capacity, competencies, evaluation, extension.

## Introduction

The purpose of evaluation is to demonstrate a program's worth (Rossi et al., 2004). Evaluation guides program planning, informs program improvement, and determines program outcomes and impact. On the 25<sup>th</sup> anniversary of the Journal of International Agricultural Extension Education (JIAEE), Murphey et al. (2018) provided a synthesis of evaluation research in extension; the literature emphasized a need for evaluation to demonstrate the value of rural advisory services (RAS) to public and private donors. Communicating public value through robust program evaluation can lead to increased partnerships, and private and public funding.

While program planning and evaluation are core extension competencies (Harder et al., 2010; Suvedi & Kaplowitz, 2016), Diaz et al. (2019) noted extension professionals' competency to conduct effective evaluations remains a major challenge. Therefore, the literature outlines a paramount need for Evaluation Capacity Building (ECB) initiatives in extension (Taylor-Powell & Boyd, 2008). ECB is "intentional efforts to both build and sustain an organization's ability to conduct quality, credible evaluations" (Hetherington et al., 2019, p. 176). With an ongoing need to demonstrate the value of extension to donors and stakeholders for program support and accountability, an ECB program was implemented at Utah State University (USU) Extension. The ECB program was designed to increase extension professionals' competency to evaluate extension programs. The ECB program included internal and external assessments, evaluation education, and evaluation publications.

## Purpose and Objectives

The purpose of this study was to determine the impact of an ECB program at USU Extension. This study provides an insight into the strategies used to increase the program planning and evaluation capacity of extension professionals. It holds implications for rural advisory services actively seeking to demonstrate program value and accountability to stakeholders and funders of extension services.

## Methods and Data Sources

This study adapted a competency modelling approach (McClelland, 1973) and followed a longitudinal design to gather panel data from USU Extension professionals. Before program implementation in 2019, a professional development (PD) assessment was conducted to gather benchmark data on extension professionals' core program planning and evaluation competencies. After, data from subsequent annual PD assessments were used to measure net gains against the 2019 benchmarks. The survey instrument followed the Borich framework (Borich, 1980), and data were gathered to monitor changes in the professional development needs of extension professionals. Following Borich's (1980) model, a professional development *need* exists when an extension professional does not possess sufficient *ability* to perform an *important* competency. A professional's ability is deemed sufficient when it matches the competency's importance; a professional should be able to perform important competencies for job success (McClelland, 1973).

Survey data were gathered in 2019 and 2021 on extension professionals' perceived ability to perform each competency and their perceptions towards the importance of the competencies for job success. The survey included core program planning and evaluation competencies identified from the body of competency research in extension education (e.g., Harder et al., 2010; Liles & Mustian, 2004; Scheer et al., 2011; Suvedi & Kaplowitz, 2016). A total of 16 competency items for program planning and 24 for program evaluation were monitored from 2019 to 2021. Results reflected data from 99 Extension faculty ( $n = 99$ ; response rate = 74%) at USU Extension. Descriptive statistics and probabilities were used to assess net changes in professional development needs between 2019 and 2021.

## Results

Two years after implementing the ECB program, there was a 42% increase in the probability of a new faculty possessing the competency to conduct a needs assessment. This translates to a 156% reduction in the professional development need relating to conducting needs assessment since 2019. This large reduction in the need was due to low performance on conducting needs assessment in 2019 compared to 2021. There was also a 30% increase in the probability of a new faculty possessing the competency to develop short-term program objectives, which equates to a 107% reduction in the professional development gap.

Results also showed a 79% increase in the probability of a pre-tenured faculty possessing the competency to conduct mini -surveys using iPads or cellphones between 2019 to 2021. This translates to a 171% decrease in the professional development need. There was also a 156% increase in the probability of a pre-tenured faculty possessing the competency to monitor program activities throughout the program's lifespan.

There was a 75% increase in the probability of a mid-career faculty possessing the competency to develop measurable short-term outcomes, translating to an 18% reduction in the professional development gap for this competency since 2019. There was a 119% increase in the probability of a mid-career faculty possessing the competency to create an evaluation plan, equating to a 71% decrease in the professional development gap since 2019.

Results showed a 43% increase in the probability of a late-career faculty possessing the competency to develop long-term program objectives extending beyond 2 years, reflected by a 19% reduction in the professional development gap since 2019. Lastly, there was a 27% increase in the probability of a late-career faculty possessing the competency to use the results of a needs assessment to plan a program, equating to an 18% reduction in the professional development need for that faculty group.

## Recommendations and Implications

This study sought to determine the impact of an ECB program at USU Extension. Results demonstrated an increase in several core program planning and evaluation competencies over a two-year period; the ECB program improved evaluation capacity at USU Extension. While this abstract identified the most notable impacts, there were many cultural and organizational factors moderating the overall effectiveness of the program. Continuous program monitoring over the



two-year period led to a host of tailored ECB strategies for extension professionals. Given the need to demonstrate program value and accountability to extension donors and stakeholders, RAS are encouraged to adopt and tailor an ECB program in their organizations. Lessons learned from this ECB program can help RAS tailor their strategies to ensure extension professionals are equipped with the core competencies to conduct quality evaluations of agricultural programs.

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## **Organizing and Utilizing Community Advisory Committees for Research, Outreach, and Extension Efforts Impacting Agriculture and Natural Resources**

Ricky Telg; Department of Agricultural Education and Communication; Center for Public Issues Education in Agriculture and Natural Resources, University of Florida

1408 Sabal Palm Drive, Second Floor  
Center for Public Issues Education in Agriculture and Natural Resources  
University of Florida  
Gainesville, FL 32611  
rwtelg@ufl.edu

Angie Lindsey; Department of Family, Youth and Community Sciences; Center for Public Issues Education in Agriculture and Natural Resources, University of Florida

Tracy Irani, Department of Family, Youth and Community Sciences, University of Florida

Lisa Lundy: Department of Agricultural Education and Communication, University of Florida

Ashley McLeod-Morin: Center for Public Issues Education in Agriculture and Natural Resources; University of Florida

Phillip Stokes: Center for Public Issues Education in Agriculture and Natural Resources, University of Florida

Sydney Honeycutt: Center for Public Issues Education in Agriculture and Natural Resources, University of Florida

Valentina Castano: Center for Public Issues Education in Agriculture and Natural Resources, University of Florida

Michaela Kandzer: Center for Public Issues Education in Agriculture and Natural Resources, University of Florida

Nathalie Santa Maria: Sunnyside Communications

Keywords: community, stakeholder, advisory, committee

Oral Presentation **or** Poster Presentation

## Abstract

### **Organizing and Utilizing Community Advisory Committees for Research, Outreach, and Extension Efforts Impacting Agriculture and Natural Resources**

#### **Introduction and/or Theoretical Framework and/or Literature Review**

Community advisory boards (CABs) or committees (CACs) provide input at various stages of community-based participatory research and help guide activities of research and outreach (Newman, et al., 2011). These CABs or CACs can be viewed as partners researchers to provide an academic-community partnership that provides community members with representation in research activities (Newman, et al., 2011). CAB/CAC members typically share a common interest or identity, such as history, language, or culture (Israel, et al., 1994). CABs/CACs provide community members with a mechanism to contribute to research about their community or interest area and to have a voice about concerns or questions they may have that researchers may not have considered (Chene, et al., 2005). CABs/CACs also provide members the opportunity to establish relationships or partnerships with other CAB/CAC members whom they would not have met otherwise (Strauss, et al., 2001; Morin, et al., 2003). CABs/CACs have been used in both public health settings (Quinn, 2004) and in environmental impact research (Lindsey, A.B., & Kumaran, M., 2016; Qu, S., Irani, T., & Lindsey, A.B., 2018).

This paper explains how three research and outreach projects used CABs/CACs (hereafter referred to in this paper as “community advisory committees (CACs)”) to conduct research, test messages, and develop outreach materials in communities of interest. The three projects outlined in this paper are:

- **Healthy Gulf, Healthy Communities: HGHC** used CACs to address environmental, economic, and social needs of communities impacted by the Deepwater Horizon oil spill. This project ran from 2011 to 2016.
- **Southeastern Coastal Center for Agricultural Health and Safety: SCCAHS** uses a CAC to help inform research and outreach efforts for such agricultural health and safety issues as heat-related illness, COVID-19 and vaccinations, and mental health/mental stress. This project began in 2016 and is currently running.
- **Ecological and Economic Impacts of Land Use and Climate Change on Coastal Food Webs and Fisheries:** This project focuses on the impact of climate change on coastal food webs and the fisheries industry along the “Big Bend” region of Florida. A CAC was developed to gather data and input on climate change’s impact in the region. This project began in 2020 and will continue through 2022.

Practices on how to organize and utilize CACs are explained in this paper. The CAC process can be adapted and utilized for Extension faculty around the world.

#### **Purpose and Objectives**

The purpose of this paper is to explain how social science researchers at the University of Florida organized, conducted, and utilized community advisory committees in three research and outreach efforts along the Gulf of Mexico. The objectives of this paper are to provide readers with insight on how to organize their own CACs and the benefits of CACs in research, outreach, and Extension efforts.

## **Methods and/or Data Sources**

In each of these three projects, CACs were organized in the following ways:

Project principal investigators (PIs) provided input on potential CAC members. Nominations were made from individuals or organizations in the region or from individuals who had a subject matter expertise in the research topic. Nominees could also nominate others, as in a “snowball” recruitment effort. Efforts were made to have a diversity of interest (business, nonprofit organizations, regulatory agencies, Extension and/or education, and public health) and backgrounds (agriculture, environmental, cultural) to be represented on each project’s CAC. In the case of the climate change/land use impact project and the HGHC project, a “scientific advisory committee” was also established, comprised of scientists from universities and local, state, and federal agencies. This group is separate from the CAC but works alongside it as qualitative data is collected.

The projects hold annual formal meetings in central locations (within a one-hour drive) for all members. Throughout the year, project PIs stay in communication with the group through phone calls, e-mail, and social media. Project PIs work closely with CAC members for their direct input to project leadership on community issues and concerns related to the projects. The CACs are informed regularly of the progress and results of ongoing research and also to develop outreach strategies, test messages and programs, and synthesize results.

## **Results, Products, and/or Conclusions**

Focus groups and listening sessions were conducted yearly to hear from CAC members. CACs provided critical insight into the gaps and needs in the communities that the project team could use to further establish research objectives. CACs worked with researchers to fine tune research questions to ensure applicable results. CAC members were active in data collection. Identifying potential barriers resulted in educational and outreach products to help explain the projects’ findings to target audiences and how best to use this information in creating programs and Extension efforts to address gaps and needs in the communities.

Based upon conversations with CACs and listening session and focus group data, a communication and outreach plan was developed to present research findings from the projects to targeted audiences or to the public. Outreach efforts include infographics, information sheets, videos, webinars, and public workshops to share information with the community and state and federal agency partners.

## **Recommendations, Educational Importance, Implications, and/or Application**

To create a functional and effective CAC, it is recommended that CAC organizers:

- Strategically recruit leaders and members representative of the target audience or interest being addressed in research, extension programming, or outreach efforts.
- Define the purpose and objective(s) for the CAC.
- Identify what the CAC’s role is, as well as what individual members roles are.
- Define how the CAC will function, including how decisions and recommendations will be made, and when and where meetings will be held.

Organizing and utilizing CACs has broad application for Extension audiences to gather information about both research and extension programming and outreach efforts. Based on

these projects, CACs helped build “networks” within the studied communities. CAC members were also able to collaborate with other CAC members who shared like interests and backgrounds and develop programs and outreach to help me the gaps and needs within their communities. CACs provide a “pulse” on how complex issues impact communities.

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**Promoting Cultural Plurality through Reflective Blogging in a Global Agricultural Leadership Course**

Emmanuel Kanchewa  
emmanuel.kanchewa@uga.edu

Dr. James C Anderson II  
jcanderson@uga.edu

University of Georgia

**Keywords:** Cultural Intelligence, Global Leadership Education, Multicultural Course, Cultural Plurality

**Authors Note**

Correspondence concerning this abstract should be addressed to James C. Anderson, Department of Agricultural Leadership, Education and Communication, University of Georgia, 131 Four Towers Bldg., Athens, GA. 30602. Phone: (706) 542-0515; Fax: (706) 542-0262

# Promoting Cultural Plurality through Reflective Blogging in a Global Agricultural Leadership Course

## Introduction and Conceptual Framework

As society begins to reengage globally post COVID-19 shutdown, the need for culturally competent, globally educated agricultural leaders is increasing (Brown, 2012; Lalah et al., 2016). However, leaders are not currently equipped to address the 21<sup>st</sup> Century challenges of producing more food using a finite supply of natural resources in the context of diverse political, economic, and civil societies (Brown et al., 2016) because many leaders need to increase the level of cultural intelligence (CQ) required to function effectively across cultures (Van Dyne et al., 2012). Therefore, increased CQ through global leadership education is pertinent for developing effective global leaders. Global Leadership Education is the development of individuals who possess the knowledge, behaviors, and attitudes to lead positive change in a larger global context (Brown et al., 2012). Although cultural sensitivity and inclusion is the foundation of interpersonal relationships as it relates to diversity (Brown et al., 2012), just acknowledging cultural differences does not mean the leader has developed a desirable level of CQ (i.e., *drive, knowledge, strategy, and action*). Therefore, what steps can be taken to increase the cultural intelligence of agricultural leaders so that they are able to reflect on what is happening within a multicultural context and adjust behaviors to better support the diverse workforce?

Brown's Model of Communication Processing was used as the framework to explore how students enrolled in a global agricultural leadership course used selective perceptions, avoidance, and group support strategies to integrate or reject beliefs about self and others (Brown, 2004). According to the model, individuals take in information through deflective filters and determine if the information deserves active evaluation or is deemed irrelevant/incompatible. Information that is actively evaluated then goes through reflective filters and is integrated into one's beliefs or rejected (Brown, 2004).

## Purpose and Objectives

The purpose of this study was to determine if blogging on *cultural plurality*; the acceptance of minority identities within a majority culture, encouraged students to evaluate, reflect, and integrate a global mindset. The research questions that guided this study are as follows:

1. Are examples of students using deflective filters (prior experiences, perceived knowledge, cultural values, history) and reflective filters (anxiety, aspirations, self-awareness, motivation, value judgments) present in the blog posts?
2. Are examples of students integrating the new information (editing beliefs, making decisions, intent to act) present in the blog posts?

## Methods

Participants for the study were graduate and undergraduate students enrolled in an advanced leadership course on ethics and culture from 2017 to 2020 ( $N = 53$ ) at a large research university located in the southeastern United States. Over that timespan 22 undergraduates and eight graduate students were took the course. Of those, seven students identified as Black, 36 as White, five as South Asian, two as Asian, two as



Latino/a, and one as Native American. There were 34 students who identified as female, 18 as male, and one as non-binary in the sample population. Students were asked to select and research, using reputable sources, an identity different from their own that was a minority identity in the context of a majority culture. They were then to create a blog entry, using prompts, that discussed how the chosen identity is marginalized and provide an editorial about what they learned and how it has impacted their understanding of the identity. Students completed four rounds based on the following topics:

1. Race, Ethnicity or Culture;
2. Religion or Belief System,
3. Sexual Orientation or Gender Roles; and
4. Ability or Social Status.

After posting initial blog entries, students responded to two peers' posts by discussing how the posts resonated with them and furthering the discussion by providing new information about the identity covered in the original blog entry.

## **Results**

Phrases indicating deflective and reflective filtering as well as integration of CQ toward multiple identities were found in the 610 original entries and responses analyzed. Students exhibited more integration of identities and thus increased CQ over the course of the semester. Earlier posts focused more on introduction of new identities and statements of awareness or *knowledge* and *strategy*. Whereas, later posts demonstrated an integration of the new knowledge with statements about advocating for the minority identities or desires/intent to engage with the identities or *drive* and *action*.

## **Implications**

With the world population coming from a multitude of faiths, socioeconomic statuses, and experiences, the ability for agricultural leaders to create inclusive environments for workers to authentically express various parts of their identity is paramount (Brown et al., 2012). This study provided support that substantive and prolonged experiences where agriculture students are able to explore different cultural identities and are guided through the reflective process using social learning decrease the potential for negative stereotypes to be confirm while encouraging the integration of cultural plurality into their global leadership mindset. Replication of the study at other institutions is recommended.

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**Stakeholder Engagement in Environmental Management: A Case of St. Martin's Island,  
Bangladesh**

Sharmistha Basak

Graduate Assistant

Department of Agricultural Economics, Sociology, and Education

The Pennsylvania State University

Room 012

University Park, Pennsylvania, 16802

[sjb6815@psu.edu](mailto:sjb6815@psu.edu)

Anil Kumar Chaudhary

Assistant Professor

Department of Agricultural Economics, Sociology and Extension

The Pennsylvania State University

University Park, Pennsylvania

***Keywords:*** Stakeholder engagement, environmental management, community-based decision-making, public participation, St. Martin's Island

## **Introduction**

The application of stakeholder engagement in managing the environment and natural resources has been an emerging concept for the last few decades. Stakeholder engagement also known as public participation refers to a process where stakeholders' interests, values, and necessities are addressed while deciding on managerial actions (Creighton, 2005). In this approach, associated communities, groups, and agencies have active roles in natural resource management decision-making and implementation. Such community-based stakeholder engagement approaches have been adopted and applied to several developed and developing countries like Australia, Vietnam, Indonesia, the US, and the Philippines (Voyer *et al.*, 2012; Elliott *et al.*, 2001; Dirhamsyah, 2014; Balgos, 2005; Tran *et al.*, 2012) to recover coral reefs, seaweeds, and other natural resources. For instance, conservation programs in Australia assess social and economic impacts before taking on any environmental management initiative (Voyer *et al.*, 2012); Indonesia provides grants to generate alternate livelihood sources for the locals, so they do not need to depend on natural resources (Dirhamsyah, 2014).

However, the concept of stakeholder engagement is still new in Bangladeshi perspectives. Unplanned tourism, over-extraction of marine resources, pollution, and destructive fishing practices in the coastal region have been so acute that several researchers (Hossain and Shamsuddoha, 2008; Hasan, 2009; Ahmed, 2019; Huda, 2004; Ahammed *et al.*, 2016) argued that community-based stakeholder engagement is essential to the success of natural resource conservation measures in Bangladesh. There is an emerging need to address the environmental issues in Bangladesh through a bottom-up community-based approach (Hossain and Shamsuddoha, 2008). Before the application of this bottom-up approach in Bangladesh, a thorough analysis of potential stakeholders, and how these stakeholders collaborate to address natural resource management issues is needed.

## **Purpose and Objectives**

The primary purpose of this study was to understand the management of environmental challenges in Bangladesh, particularly St. Martin's Island. The specific objectives of this study were to examine potential stakeholders' roles and obstacles they face while engaging in collaborative efforts to manage natural resources in St. Martin's Island, Bangladesh.

## **Methodology**

To address the above objectives, the data were collected from St. Martin's Island, the only coral reef within Bangladeshi territory. This island was declared an ECA (Ecologically Critical Area) in 1995. The intention was to ensure sustainable use of coastal resources but incorporating stakeholder engagement into this declaration was not clear (Hasan, 2009).

Semi-structured interviews and participant observation were used to learn about different stakeholders' viewpoints and environmental perceptions. Ethnographic fieldwork was conducted in 2019 for three weeks on the island. Data were collected from four different groups of stakeholders: government agency employees who were assigned to take care of the island, local non-government agency employees who were familiar with the island's context and had implemented some developmental programs on the island, local community people including businessmen, fishermen, and boatmen, and local ecotourism resort owners as they were influential in study's context.

Interviews with government agencies addressed motivations behind the declaration of ECA, how this declaration incorporated related stakeholders' interests, what activities are allowed or prohibited under the ECA act, and how they assessed locals' needs and implemented the ECA act. Interviews with local NGOs explored their interests in managing the island, potential roles in building locals' awareness about environmental issues, and possible collaboration with other stakeholders. Interview questions for ecotourism resort owners focused on tourists' activities and resorts' potential roles in managing the island. Finally, interviews with local people emphasized their activities, environmental perceptions, needs, and opinions about the island's management. Altogether 30 interviews were conducted; each interview was about 30-40 minutes. Verbal consent was ensured before interviewing and recording interviews.

Participant observation was used throughout the fieldwork. While observing, stakeholders' activities were prioritized because their awareness and motivations informed their actions regarding environmental issues. Purposive, snowball, and convenience sampling were used according to the context's needs. Pseudonyms were used throughout the data collection to make the participants' identities confidential. All data were collected in Bengali and then translated into English for easy analysis. After transcription, all data were analyzed using open coding to identify analytic patterns and themes (Warren & Karner, 2015). First, key themes were identified based on the research questions, and then the interviews and observation data were categorized according to those themes. Some of the themes used in coding were - effectiveness of ECA implementation, collaboration among stakeholder groups, limitations in locals' backgrounds, non-formal education programs, and alternative livelihood resources. Finally, all findings were validated by governmental and NGO leaflets, brochures, key informants, ECA Act, and other materials found during observation and interviews.

### **Results and Discussion**

The results of the qualitative analysis indicated that the primary role of government and non-government agencies was awareness building among the local communities. Because of limited financial and educational resources, local communities' understanding, and perceptions of sustainable environmental management were not clear. Due to this gap in environmental perceptions, the government overlooked locals' roles in managing and monitoring the island's resources. Although various local non-government agencies initiated some non-formal education programs on locals' awareness building, the projects did not last long in the absence of adequate support and coordination from the government. There was also a lack of transparency and accountability in utilizing governmental funding for stakeholder engagement in the island's management.

### **Recommendations and Implications**

Although this study predominantly focuses on St. Martin's Island, the research findings can be applied to overall Bangladeshi perspectives or any developing country with similar socioeconomic conditions and environmental challenges.

The government and non-government agencies should plan and implement non-formal educational programs addressing environmental education to fill the gaps in locals' environmental perceptions. This study also informs the policymakers and local stakeholders to incorporate stakeholder engagement in the policy framework of the ECA Act. An authorized

committee, including the stakeholders' representatives, can be developed to ensure proper use of allocated money and monitor stakeholder engagement activities' progress.

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