Conference Proceedings
35th Annual Conference of AIAEE
Linking, Innovating, Motivating, and Engaging for Resilient Agricultural Systems
April 1-4, 2019
Port-of-Spain, Trinidad & Tobago
Table of Contents

**Poster Abstracts**

*Early Career Extension Agent Program Evaluation Challenges and Obstacles: Implications for International Agricultural Extension*

*Stakeholder Platforms and Removing Barriers to Demand-Driven Extension: The Case of Malawi*

*Policy Support for Women Agri-entrepreneurs in Three OECS Countries: Stakeholders Perspectives*

*Resilient Leadership in Agriculture: Roles of Ghanaian Females*

*Using Blogs to Promote Cultural Plurality in an Agricultural Leadership Education Course*

*Sukuma Women Farmers’ Access and Right to Land Ownership: A Literature Review*

*An International Urban View of Agriculture*

*Inter- and Intra-household Food Insecurity: A Gender Perspective from Ethiopia*

*Equipping Students with Poultry Science and Agripreneurship Knowledge: Does Instructional Approach Matter by Sex?*

*Promotion of a Mandela Washington Fellowship Institute: Oklahoma State University’s Experience with Social Media*

*Greenhouses as an Approach to Development in the State of Sinaloa, Mexico: A Historical Inquiry*

*Integrating Gender-Sensitive Participation in Sustainable Intensification Research*

*A Qualitative Assessment of Concerns from Four Watershed Communities in Trinidad and Tobago*

*The Potential and Role of an Extension Service in the Provision of Sustainable Farming Practices in Gressier Region of Haiti for Alleviating Hunger and Poverty*

*Agricultural Development Storytelling: An AgriCorps Qualitative Exploratory Study*

*Behavior-Based Safety and its Applications in Organizational Settings*

*Linking GPS Data Acquisition Tools with Survey Research in Agricultural and Extension Education*

*Technology Adoption in Southern Nations, Nationalities, and People’s Region (SNNPR) of Ethiopia*
Using Visual Communication Design as a Teaching Methodology to Link Content and Engage Diverse Audiences

Global Mindedness of Pre-Service Agriculture Education Students at North Carolina State University: A Pilot Study

The Assessment of Training Needs of Mississippi State University Extension Agents in Organic Agriculture

International Service-Learning Study Abroad: A Transformational Experience

Examining the Decision-Making Process Pertaining to Public Understanding of Agricultural Systems

Perceived Barriers Affecting Extension Agents’ Personal Resilience in Post-Hurricane Response: Implications for Extension Practitioners

The Adoption of Facebook as a Personal Learning Network: Agricultural Educators Informally Professionally Developing Themselves

The Cultural Dynamics of Food Insecurity Among Farming Households in Oyo State, Nigeria

Andragogical Training for Extension Professionals in Malawi

Planning and Delivering a Mandela Washington Fellowship Institute for Entrepreneurs from Sub-Saharan Africa: Oklahoma State University’s Experience

Leadership Development Needs Assessment for Penn State Extension

Impacts on Global Perspective of Peace Corps Volunteers

Internationalizing Formal and Non-Formal Curriculum in Agricultural and Extension Education to Improve Learner Outcomes

Transforming Lives through Empowering Women: Integrating a Whole-Person Learning Approach within Education and Training Programs in Kenya

Perception of Pre-Service Teachers Regarding the Importance of Global Awareness in the High School Agriculture Classroom

Pupil Voice Groups: Do They Increase Engagement in the Community?

An Investigation of Crisis Communication Amidst Natural Disasters: Opportunities for Extension Systems
Faculty Attitudes and Motivations for Study Abroad Service Learning Programs

Designing Agricultural Extension Programs Based on Growers’ Needs Assessment Data

Experiential Learning Experiences and Leadership Development of Students on a Study Abroad Trip to Australia
Oral Presentation Abstracts

Resource Presentation Preferences of Extension Professionals in Their Use of Facebook

Gatekeepers of Food and Nutritional Security Projects in South Africa

Trust, Caring, and Communication with Safety in the Workplace: The Effects of a Behavior-Based Safety Ethnographical Case Study

The Use of Selected Social Media by a Group of Small Farmers in Trinidad

Re-examining the Role of Agricultural Communication for Improving Agricultural Productivity among Malawian Farmers

Assessing the Impact of a Collaborative Livestock Livelihood Project on Community Capacity Building in Rural Uganda

Farmer Resilience and Innovation through Community-Based Fall Armyworm Control

Creating Resilient Agriculture Systems through Customized International Training Programs: A Case Study with Bosnia and Herzegovina

Farmer Participation, Conscientization, and the Development of Resilient Agricultural Systems in Chiapas, Mexico: Implications for Agricultural and Extension Education

Personal Resilience and Coping Ability of Extension Agents in Post-Hurricane Response

The Global Forum for Rural Advisory Services: A Network Emergence Case Analysis

Promoting Innovation and Team Performance through Cognitive Diversity: A Case of Extension Agents in Morogoro-Tanzania

Linking Undergraduate and Graduate Students to Extension Careers by Engaging in International Agricultural and Food Systems

Utilizing Programming Frameworks of the International Community Health and Community Animal Health Programs for International Agricultural Extension

Spatial Patterns of African Indigenous Vegetables Value Chain Actors: The Case of Narok and Kajiado Counties, Kenya

Coping Strategies to Food Insecurity in Southern Nations, Nationalities, and People’s Nationalities (SNNPR) of Ethiopia: A Gender Perspective

Village Chicken Production in Kenya: Addressing Challenges through a Social Exclusion Framework
Socio-Cultural Practices that Impact Sukuma Women Farmers’ Land Ownership: A Qualitative Study

Gender Roles in Dairy Production and Women’s Access to Agricultural Advisory Systems in Western Afghanistan

The Phenomenon of Women’s Empowerment Projects Fostered by the INGO Field of Hope in Northern Uganda

Experiential Service Learning and Reflection: What International Experiences Can Teach Us About How We Learn

The Forms of Dissonance Experienced by U.S. University Agriculture Students During a Study Abroad to Nicaragua

Using International Experiences to Drive Innovation in Extension Agent Program Development

A Content Analysis of International Agriculture Experiential Learning Modules

Exploring the Impacts of an International Field Experience on the Social Capital of University Faculty

Teacher Perception of Students’ Extension Competency Within Post-Secondary Agricultural TVET Schools in the West Department of Haiti

Empowering Local Leaders to Teach: A Case Study on Haitian Vocational Agricultural Students’ Teaching Self-Efficacy

Student Perception Towards a Distance Based Agricultural Education Program in Uganda: The Case of the Bachelor of Agricultural and Rural Innovation-External, Makerere University

Evaluating Research for Development: A Framework to Assess the Impact of a Feed the Future Innovation Lab

Cognitive, Metacognitive, and Motivational Perspectives from Preflection and Post Reflection After a Service Learning Experience in Timor-Leste

Farmers’ Use of Information Communication Technologies and Preferences for Digital Content in Trinidad

Information and Communication Technology (ICT) Proficiency among Extension Agents and its Impact on the Adoption of Cyber-Extension in Indonesia

Exploring the Status and Use of Information and Communications Technology (ICT) for Accessing Agricultural Information in Rural Tanzania
Extension Officers’ Willingness to Use Information Communication Technologies to Interact with Farmers in Trinidad

Promoting Effective Use of ICTs with Technology Stewardship: Findings from a Training Course for Agricultural Extension Professionals in Trinidad and Tobago

Program Evaluation Competencies for Extension Professionals: Evaluation Specialists’ Consensus for International Extension

Exploratory Factor Analysis and Internal Consistency of Agricultural University Students’ Critical Thinking Attitudes

Analysis of School Garden Performance in the Southwest Region of Ghana

Assessing Impact of a Mandela Washington Fellowship Institute for Entrepreneurs from Sub-Saharan Africa: A Phenomenological Study

Formation of African Fellows’ Entrepreneurial Identities: Evaluating a U.S. Fellowship’s Impact

Farmers’ Experiences with Irrigation: A Phenomenological Photovoice Study

Stakeholders’ Perceptions of Watershed Concerns in the Northern Range of Trinidad and Tobago

Effects of Climate Change on Communal Conflicts and Clashes between Farmers and Herdsmen in Adamawa State Nigeria: Views of Household Heads, Midcareer Extension Students and Lecturers

Understanding Smallholder Farmers’ Preference for Institutional Support for Climate Change Adaptation: Evidence from Northwestern Ghana

Leveraging Problem-Solving Styles in Leadership Learning to Create Solutions to Address Complex Adaptive Problems

Results of a Needs Assessment Model for Improving Agricultural Education in Guinea

An Exploratory Measure of Self-Perceived Writing Skills of International Agricultural Educators

Needs of Ethiopian Wheat Farmers

Perceptions of Leadership Development and Cultural Awareness Prior to an International Study Experience by Agricultural Leadership Program Participants

Status and Practice of Small-Scale Coffee Producers in Nepal’s Tanahu and Lamjung District: An Extension Education Needs Assessment
Comparison of Texan and Nicaraguan High School Students’ Knowledge of and Attitudes Toward Sustainable Agriculture

Explaining the Brain Drain: Intentions of Youth Migration in Chalatenango, El Salvador

Barriers, Challenges, and Alternatives for Planning International Youth Visitor Exchange Programs: Implications for International Agriculture Extension Education

The Adoption Potential of Agricultural Education Curricula for Girls in a Rural Ugandan Empowerment Project

School-based, Agripreneurship Projects (SAPs) that Integrate Youth-Adult Partnerships: The Experiences of Student (Youth) Partners in Uganda

African Entrepreneurs’ Views on Youth Empowerment: The Influence of a U.S. Fellowship

Sustainable Harnessing of Agricultural Technologies among Smallholder Farmers in Western Kenya

Journey Mapping in International Extension: A Proposition for Innovative and Participatory Monitoring and Evaluation

Planning Change: A Case Study on Cooperative Extension’s Contribution to Creating a Culture of Continuous Improvement in Educational Programs

Strategies to Alleviate Food Insecurity in Kenya: A Delphi Study
Poster Abstracts
Early Career Extension Agent Program Evaluation Challenges and Obstacles: Implications for International Agricultural Extension

John Diaz
University of Florida
Anil Kumar Chaudhary
The Pennsylvania State University
K.S.U. Jayaratne
North Carolina State University
Laura A. Warner
University of Florida

Introduction

Extension’s ability to promote the resilience of agricultural systems centers on the Extension agents’ capacity to deliver impactful programs. To ensure agent capacity, Extension utilizes a competency development model focusing training activities around core competencies (Brodeur, Higgins, Galindo-Gonzalez, Craig, & Haile, 2011). Lucia and Lepsinger (1999) defined competency as “…a cluster of related knowledge, skills, and attitudes that affects a major part of one’s job (a role or responsibility), that correlates with performance on the job, that can be measured against well-accepted standards, and that can be improved via training and development (pg. 2).” Program evaluation competency is expected among Extension agents to demonstrate the impacts of their programs and make programmatic improvements as necessary. Typically, program evaluation is a skillset that many of these educators build once hired (Radhakrishna & Martin, 1999).

McClure, Furhman, and Morgan (2012) found newer Extension agents struggled with: (a) writing about evaluation findings in an impact statement, (b) writing clear questions for questionnaires, and (c) analyzing the questionnaire data collected. These challenges resonate among International Extension communities that have less resources for professional development (Feder, Willett, & Zijp, 1999; Murray, 2000). According to Lamm, Israel, and Diehl (2013) the majority of Extension agents only use post-tests administered following an educational activity to evaluate success. Extension agents may lack the competency to design long-term impact studies or conduct advanced statistical analysis resulting in focus on participation and participant reaction (Lamm et al., 2013). Understanding the common program evaluation challenges that early career agents face will contribute to determine the actions needed for extension evaluation capacity building in various extension systems around the world.

Purpose and Objectives

The purpose of this study was to demonstrate a consensus-driven process to identify the central challenges and obstacles for early career Extension agents’ program evaluation efforts. Given the diversity of challenges and obstacles that may exist in different Extension systems, the objectives were to determine whether consensus could be achieved and whether a core set of challenges and obstacles exist.

Methods and Data Sources
We utilized a three round Delphi study approach (Warner, 2015) to identify the most important challenges and obstacles faced by early career Extension agents. We developed an expert panel of Extension agents from various program areas and Extension systems, with one to three years of experience. The expert panel was selected by Extension administrators.

The first round consisted of two open-ended questions asking the participants to list program evaluation challenges and obstacles. The constant comparative method (Glaser, 1965) was used for data analysis, resulting in the identification of 36 challenges and 13 obstacles in the first round. The subsequent rounds narrowed down the list of challenges and obstacles utilizing a Likert-type scale for importance. We used the definition of consensus to be 2/3 of the group identifying extremely or very important in regard to addressing each program evaluation challenge and obstacle (Warner, 2015).

Results and Conclusions

The expert panel demonstrated consensus on 26 challenges and 7 obstacles. Over 90% of the panel agreed that the following challenges are extremely or very important to address: (a) determining program impacts and how to measure those, (b) development of accurate evaluation instrument for a given situation, and (c) evaluating newly developed programs. Most of these challenges mirror those found in the literature demonstrating that early-career Extension agents struggle with developing evaluation plans, instruments, and assessing the long-term impacts of their programs (Lamm et al. 2013; Radhakrishna & Martin, 1999).

Additionally, over 80% of the panel agreed that the following obstacles are extremely or very important to address: (a) lack of evaluation mentorship, (b) lack of clear expectations and guidance from supervisor for evaluation and (c) lack of evaluation training. These findings provide structural and system-level impediments that may prevent Extension agents from developing the appropriate evaluation competencies. A better system of support and guidance is needed to help early career agents build their confidence and skills (Feder, Willett, & Zijp, 1999).

Recommendations and Implications

Since the challenges outlined in this study do not differ greatly from those already outlined in the literature, it brings to question the persistence of these issues. Extension systems across world must evaluate structural and systematic obstacles that exist for Extension agents as a starting point for change. The findings of this study have direct implications for addressing the evaluation capacity building concerns of new extension personnel around the world. Additionally, key stakeholders in any system can use the process outlined in this study to identify unique local competencies for professional development.

References


Stakeholder Platforms and Removing Barriers to Demand-Driven Extension: The Case of Malawi

Austen Moore
University of Illinois at Urbana-Champaign

Vickie Sigman
Independent Consultant

Introduction
Many developing countries are transitioning towards demand-driven and decentralized extension models that refocus services to better match field-level needs (Birner & Anderson, 2007; Swanson & Rajalahti, 2010). Stakeholder platforms are common mechanisms for aggregating and prioritizing needs, and communicating them up to higher levels where service providers can respond (Thiele et al., 2016).

However, these countries face challenges, not only in implementing new systems but in acclimating farmers and other stakeholders to their new roles. Simply forming stakeholder platforms is seldom enough, as the skills needed to run a platform are not innate and require capacity building. When platforms are ineffective, the entire system is compromised, meaning services remain centralized, top-down, and often incongruous with farmers’ actual needs. This affects technology adoption, food security, and nutritional outcomes (Adekunle & Fatunbi, 2012).

The Strengthening Agricultural and Nutrition Extension (SANE) project in Malawi is addressing this gap by strengthening the District Agricultural Extension Services System (or DAESS), a multi-level system of stakeholder platforms that has remained largely ineffective since its inception (Chowa, Garforth, & Cardet, 2013; Ragasa & Chiyu, 2016). SANE’s Theory of Change is that: If DAESS platforms are strengthened and capacities are built in their operation, then farmers’ voice will be enhanced and coordination and collaboration with service providers will improve, leading to better access and quality of extension services.

Purpose
A Rapid Assessment was conducted to test this Theory of Change and assess impacts of programming on:
1) Platforms’ functionality and capacities
2) Farmers’ voice
3) Collaboration and coordination with (and by) service providers
4) Quality and access of extension services

Validating the approach has implications for extension strengthening in other countries.

Methods
Using a qualitative approach, focus groups and key informant interviews were conducted to generate feedback and gauge changes to extension services and system functionality. Three project districts (Lilongwe, Dedza, and Balaka) and one non-project district (Salima) were
purposively selected, and respondents were selected using a stratified approach to include various categories of extension stakeholders and different levels of platforms (Flick, 2009).

Data was collected by two teams comprised of an independent consultant, SANE staff, and senior administrators from the Department of Agricultural Extension Services. A total of 168 participants were engaged, through 14 focus groups and 17 interviews. Audio recordings were analyzed using open coding and content analysis (Cresswell, 2013). This resulted in isolating central themes and key issues.

**Results**
Results showed that platforms trained using the DAESS Implementation Guide and SANE-devised Standard Operating Procedures for managing meetings, electing leaders, etc. were considerably more functional and capable than before, and than counterparts in the non-project district that received no training. A senior government extensionist explained that platforms now functioned ‘because of the capacity that has been built in the system.’

Furthermore, participation in platforms had increased and farmers felt empowered. ‘Because we are now coordinated, we share problems and discuss the means through which we can address the problems. In unity there is power, such that we are able to see opportunities existing in our community,’ stated a village-level platform member. This meant platforms were more organized, better prioritized and communicated needs, and more effectively held service providers accountable. ‘We are now able to bring all the stakeholders together and connect all agricultural interventions in the district.’ reported a farmer. As a result, service providers were increasingly coming to platform meetings to engage farmers directly and share new technical information and farming methods.

The strengthened platforms, which disseminate information down to communities as well as needs up to service providers, were enabling extension messaging to reach more farmers than before. An extension worker confirmed that ‘[platform] leaders make a multiplication of my efforts.’ In addition, service providers and researchers who had struggled with how to properly teach farmers, were being “coached” by the platforms in a way that enabled them to improve service quality. Extension workers said that by ‘knowing demands, we are able to do training and meet [farmers’ needs].’

**Recommendations and implications**
These findings are potentially beneficial for other extension systems shifting towards demand-driven models. If, as in Malawi, strengthening platforms’ functionality and capacity has multiplier effects on farmers’ voice, collaboration/coordination, and quality/access of extension, then the implications for agricultural development are considerable. Countries are encouraged to focus efforts on the platforms themselves and empowering farmers to be better advocates for their own needs. When these approaches are used in other contexts, further research will be required to determine specific weaknesses with stakeholder platforms and to track interventions’ sustainability over time.

**References**


Policy Support for Women Agri-entrepreneurs in Three OECS Countries: Stakeholders Perspectives

Introduction
The Organization of Eastern Caribbean States Secretariat, concluded that constraints in agriculture are emanating from “weak policies” (OECS Secretariat, 2003, p. 6). With concerted efforts to foster the development of women in agriculture and agri-entrepreneurship, supporting policies are important. The value of women producers as an untapped resource for food, nutrition and economic growth is now recognized (Tenna, 2016, p. 8) and as such policies should have evidence that the views and contributions of women are actively sought in policy design (ILO and AfDB 2007, p. 22), since targeting women for involvement contributes to creating an enabling environment for their development. An environment for women is evident in policies that include them in the target population and provides opportunities for women’s involvement in decision making (FAO, 2016, p. 4).

Purpose
This study emanating from a wider study sought to determine the extent of consideration given to the involvement of women in policy leadership and Development of agri-entrepreneurs.

Methodology
The study surveyed forty (n = 40) key informants in three countries, Grenada, St. Lucia and St. Vincent. They represented government organizations (n = 7), NGOs (n = 5), statutory bodies (n = 6), financial institutions (n = 6), academic institutions (n = 4), regional and international organizations (n = 6), private associations (n = 4) and farmers’ associations (n = 2).

Stakeholders’ selection was guided by the ILO, and AfDB and selected according to their involvement in policy programme development and implementation. Such involvement provided their organizations with opportunities to influence the content of national or sectoral agricultural policies and programmes.

The survey instrument consisted of three sections. Section 1 reviewed key informants’ involvement in policy formulation. Section 2 the level of consideration on women’s involvement in policy leadership and development and section 3 the demographics. Respondents responded yes, no or not sure to seven factors on involvement in policy and programme designs and implementations. They also rated six questions on a 4-point scale, the extent of consideration given to involvement of women in policy leadership and development of women agri-entrepreneurs. Descriptive analysis was done using SPSS version 24.

The survey instrument was reviewed and evaluated for content validity by experts from The University of the West Indies with expertise in agricultural extension development and gender.

Results
The key stakeholders included 66.7% male (n = 27) and 33.3% female (n = 13). Most were in the age range of 41 – 50 years old 37% (n = 15). Some 84.6% (n = 34) attained a tertiary level education and 45% (n = 18) held managerial positions.
Some 75% (n = 30) indicated they made inputs in planning projects and programmes for agri-entrepreneurial development. Over sixty percent (67.5%, n = 27) had inputs in policy advice, while a further 70% (n = 28) indicated engaging in policy formulation.

While most of the participants were involved to some extent in policy programme development regarding agricultural and entrepreneurial development, just over half (52.8%, n = 21) stated that their organization had not participated in projects and programme implementation for agri-entrepreneurial development specifically designed to target women’s overall development in the field.

Regarding considerations given women’s involvement in policy leadership and development, some 62.1% (n = 25) indicated that limited or no consideration is given to women’s representation on advisory boards. Some 52.8% (n = 21) indicated that projects and programmes were not designed to target any one particular gender.

**Recommendations/Educational Importance**

Findings suggested that most of the key stakeholder organizations were involved in policy development and implementations relating to agri-entrepreneurship development which puts them in a strategic position to determine whether the policies and programmes were designed with women as a target. Note that over 60% (n = 27) were men, suggestive that the majority of persons at the decision-making level were heavily skewed towards men. The results highlighted that these organizations were involved in designing policies, projects and programmes for the development of women agri-entrepreneurs, yet the results showed that these policies did not target women specifically and gave limited opportunities for women to be on advisory boards. These findings suggest that there is a critical need for policy and programme review and that in reviewing, concerted efforts should be made to incorporate women in the discussion towards change.

The study is recommending education and training to bring awareness to the importance of including women in the decision-making process with regard to agri-entrepreneurial development. Development of policies that is inclusive of gender sensitive business development strategies towards an enabling environment for agri-entrepreneurial development.

**References**


Resilient Leadership in Agriculture: Roles of Ghanaian Females

Jaehyun Ahn
Gary E. Briers
Texas A&M University

Introduction
The Council for Scientific and Industrial Research–Crops Research Institute (Ghana’s national agricultural research unit) and South Korea’s Rural Development Administration invited a team of researchers to the Volta Region and Afram Plains District for rice development. Initially, the team engaged three officers from the Ministry of Food and Agriculture and more than sixty farmers who described the ratio of more than 3,000 farmers to one extension agent—a ratio inadequate to transfer agricultural services, technologies, and inputs. Internally in agriculture and rural affairs, aging-related issues had become severe; gradually but consistently, daughters and sons migrated to urban centers for education and jobs. Ahn (2017) addressed another fundamental problem. In Volta, males in agriculture numbered 31,245 while females accounted for only 12,151 in 2015. To increase rural competitiveness, extension agents, as change agents, should identify opinion leaders in the community and strategize what services and scope are desired, and how to transfer those effectively within that scope (Rogers, 2010).

Purposes
Experience invokes practical education (Dewey, 1938). As one of the researchers, I conducted follow-up research in the Afram Plains District–from June 11 to August 2, 2017. Particular objectives for the study arose in the field. The primary purpose became to understand female leadership holistically. The second was to identify key characteristics, and implications addressed extension plans of action.

Data and research procedures
I conducted 12 unstructured and structured interviews in seven villages for approximately 30 minutes each. I observed villages and their residents and interactions meetings, I transcribed and then formulated questions, based on patterned interactions, responses, and priorities. To several impromptu questions, the research phenomenon (female leadership) arose. Categories and dimensions were structured, compared among communities, and proved (or rejected) by in-vivo codes (Strauss & Corbin, 1998). Triangulation in qualitative research served to validate the phenomenon, and the pivotal role of community members was clarified vis-à-vis my interpretations. Articles from the Journal of International Agricultural and Extension Education confirmed findings.

Results and conclusions
Food security, youth education, and crop production were the primary categories identified and discussed in the interviews. The female leader in the ‘Hwenyanso’ village explained proximity to the Afram River:
We have water for families and farms. But (in) every dry season, the river dries up. It burns our throats and crops.

Then, another of 20 female members expounded her leadership in working to prevent food-insecurity:

*Despite [drought], we never run out of food. We predict and ask for reserving specific amounts after the harvest. We get extra advice on market items. Those supplement our health.*

Some young mothers remarked on child education:

*We have a firm belief in education. Here in the community center, we make sure every child whether male or female [is] equally educated.*

Participants’ circumstances did not differ across villages. All members relied on one extension agent. None of the interviewees felt they had enough contact with an agent, although the government purportedly arranged services whenever needed. Nor was there adequate advice on growing staple crops—maize, cassava, plantain, and yam—and groundnuts, eggs, and peppers. The youngest mother shared the experience of harvesting three 82 kg rice-paddy bags, commenting:

*Rice is a profitable crop. No others grew, but we did last season. The land was fertile. Even though it was, my husband and I decide not growing more this year. We spent too much time to harvest rice.*

“Servant leadership” evolved from the phenomenon. Foresight emerged, empowered, and sustained the community. I found similarities in two more villages. Female leaders were confident about food security, youth education, and agricultural production. The other four villages lacked leadership. For instance, some “Nsuogyaso” villagers were economically better off than most people in the leadership-centered communities. They were farmers but simultaneously local traders. They repeatedly responded with “not enough” and “no hope” in terms of agriculture.

Conclusions summing up the study:

1. Gender equality in agricultural and rural development must be present (Davis, 2016).
2. Female leadership nurtures community growth. Rural communities must value a leader’s experience and vision rather than the leader’s gender (Bartholomew, Bergom, McCune, & Kapp, 2011; Mukembo, Uscanga, Edwards, & Brown, 2017).
3. Servant leadership in communities exemplifies female leaders who extend efforts to solve communal problems.

*Educational importance*

This study suggests extension agents expand their roles to educate about food–security strategies and literacy for sustainable rural development. To be effective, change agents must work closely with female leaders.
References


Using Blogs to Promote Cultural Plurality in an Agricultural Leadership Education Course

Maddison L. Holder
James C Anderson II
University of Georgia

Introduction and Conceptual Framework
As society enters a new paradigm of globalization, 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 21st Century challenges of producing more food using a finite supply of natural resources in the context of diverse political, economic, and civil societies (Brown, Whitaker & Brungardt, 2012; Lalah et al., 2016) because many do not possess the level of cultural intelligence (CQ) needed to function across cultures (Van Dyne, Ang, & Liverman, 2010). 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 conceptual framework to explore how students enrolled in a global agricultural leadership education 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
Content analysis (Hodder, 2000) was conducted on blog posts and peer responses of 119 graduates and undergraduates enrolled in global agricultural leadership courses at two land-grant institutions from 2013-2018. Students were asked to select and research a minority identity in the context of a majority culture that was different from their own. They then created a blog entry,
using prompts, that discussed how the chosen identity is marginalized and provided an editorial about what they learned and how it has impacted their understanding of the identity. Students completed four rounds over the semester 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 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 646 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.

**References**


Sukuma Women Farmers’ Access and Right to Land Ownership: A Literature Review

Asha H. Shayo
Rickie. Rudd
Virginia Polytechnic Institute and State University

Amon Z. Mattee
Sokoine University of Agriculture- Tanzania
Donna Westfall-Rudd
Thomas Archibald
Virginia Polytechnic Institute and State University

Introduction
Agriculture is one of the important sectors in Tanzania contributing to economic growth and poverty reduction. But this sector is underperforming in part because women who are crucial resources in agricultural and rural economies face constrains in accessing land due to both social-cultural and legal barriers (FAO, 2010-2011). Women must have rights and equal access to resources, food security education, decision making, in a culture free from violence and discrimination (Earth Negotiation Bulletin, 1995). In parts of Tanzania discrimination against women’s access to, use of and control over land is found in formal, informal and customary land tenure systems. The existence of patrilineal and matrilineal societies has different cultural norms and beliefs across regions such as the Sukuma tribe (Myenzi, 2010).

Purpose
The purpose of the literature review was to obtain multiple perspective from the literature about women and resources acquisition, their power to make decisions in matters relation to agriculture and especially women farmers’ land ownership.

Methodology
The authors used several search engines such as AGRICOLA, google, google scholar, university library, Journals, and government database. The search included phrases like, women in agriculture, women farmers and access to resources, Culture and women access to resources, current status on women farmers’ access to land. The articles and reports were selected based on the relevance of the topic, and for those older than ten years provided the overview on how the situation was and the initiative started.

Results
The current threats to aggressive commercial control in agricultural lands and resources from systematic and massive land grabbing undermine rural women’s rights to access and control resources, including land, local knowledge, and other economic practices (FAO, 2010-2011). Due to cultural differences, women farmers’ access to resources draws the attention of researchers, policy makers, international organizations, and women around the world to have the right models that can be used to make women farmers have equal access to resources (FAO, 2010-2011). The Theory of Planned behavior by Fishbein & Ajzen (2010) recognize the interrelatedness between women and men’s perceptions, behavior, and attitudes toward cultural practices that impact women farmers’ land ownership. The theory of Planned Behavior as others formed it helps the reader to understand the researcher’s perspective and the study context.
While Tanzania’s current legislation guarantees equal rights for both women and men to buy, own, use and manage land, cultural context limits Sukuma women farmers’ access to land. Cultural norms in rural areas remain biased against women’s ownership of and control over land (Enwelu, Morah, Dimelu & Ezeano, 2014). With the difference in cultural norms and beliefs around the globe, this discussion is intended to identify cultural norms and beliefs that strongly impact Sukuma women farmers’ access to and control over land (IFAD, 2011).

**Recommendations**

Majority of women in Tanzania are rural women and agriculture remains to be the most important economic activity. Women are the main part of agricultural labor force and contribute to the local and national income. Despite their important role in agricultural production, Sukuma women farmers’ ability to access and manage land remains highly restricted due to customary laws, culture norms beliefs and traditions. The patriarchal ideology that dominates Tanzania’s societies gives power to men on decision making on all matters related to their tribes.

It is possible for the current situation to be improved for Sukuma women farmers to have access and control of land. Through undertaking modification of social, political and cultural pattern in communities, Tanzania can achieve the elimination of biases and improper practices against Sukuma women farmers. Promoting broad-based public awareness raising, through public engagement programs like participatory training, use of mass media, theatre, user-friendly publications is very important to communities. Also building a knowledge base for communities to participate, demand and practice what is provided for them in the law is needed However, it is the responsibility of the government at all levels to ensure that all rights of men and women are protected under the law.

**References**


Globalization has brought an era of changes in agriculture (Von Braun & Díaz-Bonilla, 2008) by intensifying food trade throughout the nations (Caswell, 2005) and giving farmers the necessary technology to produce more crops more efficiently. At the same time, globalization and technology have increased migration especially from the rural areas to the urban areas (Lee, 1966).

Nowadays, because fewer people are working in agriculture, many people are several generations detached from agriculture and their perceptions of agriculture can be vastly different from a farmer’s perception (Goodwin, Chiarelli, & Irani, 2011). However, that does not mean they do not want to know where their food comes from; on the contrary, people are more interested in discovering where their food come from (Forde, 2015). There is an increasing consumers’ demand in understanding food industry practices (Krause, Meyers, Irlbeck, & Chambers, 2016; Morris, 2016). However, it is difficult to provide this information because it needs to be appropriate and needs to target the right audience (Verbeke, 2005). Adding to the confusion are the multiple voices offering different messages about agriculture, making it difficult for consumers to differentiate between accurate and inaccurate information (Terry & Lawyer, 1995).

Purpose and Objectives
The purpose of this study was to understand the influence that agricultural communications has on urban areas in different parts of the world.

1. What is the overall perception that participants have about agriculture?
2. What is the most commonly used channel of communication to teach about agriculture in urban areas?
3. What agricultural messages our participants perceive to be accurate or inaccurate?
4. What is the perceived importance of agriculture among urban residents?

Methodology
Researchers used a convenience sample in which 97 young people completed an online questionnaire. The questionnaire consisted of 22 questions including demographics, 10 5-point Likert-type questions and 5 open-ended questions. The population consisted of urban college students and young professionals from 12 different countries. Descriptive statistics were used to analyze the data.

Results
On average, participants were 26 years old and they were from 12 different countries. The countries with the highest frequency of participants were: Bolivia, China, El Salvador, and the United States. Sixty percent of the participants had completed their bachelors’ degree.

Results of objective one showed that on average, most of the participants have a neutral perception of agriculture ($M = 3.73; SD = 0.89$).

Objective two aimed to understand the channels of communication used to provide messages about agriculture. Twenty nine percent of the participants say that they receive agricultural information through the TV. The second category with the highest frequency is “I do not know” with almost 20% of the participants.

Objective three assessed how much agricultural information our participants think is accurate or inaccurate. Results show that most of the participants scored neither disagree nor agree to these statements: “Most of the agricultural advertisements I am exposed to tell me the truth” ($M = 2.77; SD = .91$) and “Most of the agricultural information I see in the ads is false” ($M = 3.03; SD = .81$).

Objective four sought to determine the perceived importance urban residents give to agriculture. Results show that most of the urban participants consider agriculture between extremely important and very important ($M = 4.50; SD = .616$).

**Conclusions and Recommendations**

This study was developed with the purpose of creating a baseline and starting conversations that involve agricultural education for non-farmers. Results show that participants consider agriculture a very important practice and they do have a positive perception of it. However, since they did not have the opportunity to receive a formal agricultural education, they are not sure if the content that they see on the TV and internet about agriculture is accurate. Finally, almost a quarter of the participants did not know where to find accurate agricultural information or ascertain who is disseminating it. Future studies can be developed with a larger sample and in a specific country in order to enhance agricultural education for urban residents.

**References**


Introduction
Food insecurity is a major problem in Ethiopia, but the issue goes beyond scarcity of food; it is about inequality, which begins in the home (Hadley, Lindstron, Tessema, & Belachew, 2009). Though efforts have been made by Ethiopia’s government to decrease the existing gap in gender equality, food security problems still tend to affect women more than men (Bakala, 2016). Females often suffer from unequal access to food and are excluded from decision-making regarding the allocation of food even in their own homes (Belay, Mengesha, Woldegebril, & Gelaw, 2016; Marmot, 2007).

Dibaba, Fantahun, and Hindin (2013) declare that women who experience household food insecurity are five times more likely to report depressive and anxiety symptoms, consequences beyond the nutritional effects. As mentioned by Onarheim, Tadesse, Norheim, Abdullah, and Miljeteig (2015), Ethiopian poor, non-educated, non-employed women living in rural areas are worse off in multiple terms of access to reproductive health services.

In a world in which we are continuously growing, investing in gender equality will therefore decrease mortality rate, making this one of the smartest investments for development. Improving women’s autonomy will help to attain both gender equality and improvement in the socio-economic development of the country as shown by Yigzaw, Zakus, Tadesse, Desalegn, and Fantahun, (2015) and Wado (2017).

Purpose and Objectives
The purpose of this study is to explore the differences in food security between males and females at the household level in the Southern Nations Nationalities and Peoples Region (SNNPR) in Ethiopia.

1. Determine differences in food security between male and female headed households.
2. To explore differences in the division of food resources at the household level between male and female heads of household.

Methodology
For this quantitative study, data were collected in 2014 via surveys from a randomized sample of women in twenty districts (woredas) of the SNNPR in Ethiopia. A total of 11,462 women responded to the 400-item survey. Enumerators were used to bridge gaps in literacy and language among survey respondents. Data were analyzed using SPSS v. 24 using descriptive statistics and Chi Square.

Results
Objective one results indicated a significant difference between food security problems and the gender of the household head (p< .001). Female-headed households experienced higher levels of food insecurity than male-headed households.

Results for objective two presented a significant difference in how food resources are allocated in male-headed households and female-headed households (p< .001). In male-headed households, women present more food insecurity than in the female-headed households. When asked about prioritizing the distribution of food resources, there was a significant difference (p< .001) in male-headed households and female-headed households; women in male-headed households were considered a lower priority for food allocation.

Conclusions and Recommendations
Overall, women in the SNNPR reported higher incidences of food insecurity than men. The tendency toward food insecurity was present in female-headed households, which is consistent with previous findings on food insecurity (Akadiri, Nwaka, Jenkins, 2017). Yet women in male-headed households reported having less decision-making power over the allocation of food resources and were not prioritized in the distribution of food among household members. In other words, they have limited agency over their food intake. There is a need for empowering women through education in Ethiopian society in order to reduce the present food insecurity. It is recommended that these socio-cultural changes must be treated with delicately. Further research needs to be conducted to determine how to best meet the empowering of women without interfering with the existent culture.

References


Equipping Students with Poultry Science and Agripreneurship Knowledge: Does Instructional Approach Matter by Sex?

Stephen C. Mukembo, Ph.D.
M. Craig Edwards*, Ph.D.
Craig E. Watters, Ph.D.
J. Shane Robinson, Ph.D.
Jon W. Ramsey, Ph.D.
Oklahoma State University

Introduction
Agricultural education is interdisciplinary and “serves as the bridge between agricultural science and other disciplines” (Barrick, 1989, p. 27). Historically, project-based learning (PBL) has been the cornerstone of experiential learning in agricultural education (Davis, 1911; Moore, 1988). PBL equips students with life skills as they learn to transfer content knowledge across disciplines to achieve their desired goals. For example, integration of agriculture and entrepreneurship or agripreneurship using a PBL approach helps to provide students with entrepreneurial skills for self-employment and job creation (Mukembo, 2017). However, PBL requires a substantial amount of time and resources to implement (Nilson, 2010). As a result, most teachers, especially in developing countries such as Uganda, opt to use the lecture approach (Namuli-Tamale, 2014). Such an approach is convenient for large classes with limited resources (Mills, 2012), but it often does not promote critical thinking and students tend to forget much of what was taught in a short time (Menges, 1988).

Conceptual/Theoretical Framework
The overarching conceptual framework of this inquiry was Kolb’s (2014) model of experiential learning. Kolb’s model has four conceptually interrelated phases, and students ought to go through all stages during the learning process (Kolb, 1984). Kolb contended that in the learning process, ideas are organic and transformed as individuals encounter new experiences, and learners reflect on their experiences to make abstractions leading to the creation of new knowledge and understanding (Kolb & Kolb, 2009).

Purpose/Objectives
The study sought to compare students’ poultry science knowledge and their intent to become agripreneurs based on the instructional approach: PBL featuring agripreneurship versus traditional, lecture-based instruction. Also, relationships between students’ characteristics and selected variables were analyzed. Two objectives supported by four null hypotheses guided the study: (a) compare students’ poultry science knowledge based on the instructional approach used; (b) describe relationships between students’ characteristics and other selected variables.

Methods/Data Sources
The study employed a quasi-experimental, nonrandomized control group design (Campbell & Stanley, 1966). Participants were Senior Two students (~12 to 20 years) who attended four single-sex, boarding secondary schools (two girls and two boys) in Uganda. Participants were selected using a stratified sampling technique (Creswell, 2014). Existing class groupings known as streams (Sukhnandan & Lee, 1998) constituted the strata. Students were equally divided into
treatment and counterfactual groups. The treated group received training on agripreneurship in the context of poultry science using PBL, and the counterfactual group experienced traditional, lecture-based instruction. Pretest and posttest questionnaires were used to collect data from 280 participants. Data were analyzed using ANCOVA (Cook & Campbell, 1979) to determine if statistically significant interactions or differences existed among the groups, including differences between sexes. Appropriate bivariate analyses (Bryman, 2012) were conducted to describe associations.

Results/Conclusions
The four null hypotheses were rejected. For example, a statistically significant interaction ($p < .01$) was found between students’ groups and sex with a medium effect size. Because the interaction (Kirk, 2013) could not be disentangled, this finding implied that males and females were affected differently depending on their group. It was noted that males in the counterfactual group had higher adjusted marginal and observed mean scores on the posttest of poultry science knowledge than females in the same group. However, females in the treatment group had higher adjusted marginal and observed mean scores on the posttest of poultry science knowledge than males in the same group.

A statistically significant association with a small effect size was found at $p < .05$ between students’ sex and their intent to become agripreneurs in the future for the treatment group. More females than males in the treatment group indicated being either likely or highly likely to become agripreneurs in the future. This implied that females in the treatment group benefited more from the intervention, i.e., PBL featuring agripreneurship, than their male peers.

Recommendations/Educational Importance/Implications
Fewer female entrepreneurs exist globally compared to men (Koellinger, Minniti, & Schade, 2008), which has been attributed to lower perceived entrepreneurial self-efficacy among females (Coleman & Robb, 2017). Therefore, employing a PBL approach to equip females with agripreneurship skills could increase their perceived entrepreneurial self-efficacy (Sweida & Reichard, 2013), including the likelihood of becoming agripreneurs.

Because of a statistically significant interaction between students’ groups and sex for poultry science knowledge, the interaction could not be disentangled (Bailey, 2008); thus, these results were inconclusive. Therefore, additional research should be conducted to establish the impact of using various teaching approaches on students’ performance by sex regarding their acquisition of poultry science knowledge.

References


Introduction/Conceptual Framework
An effective social media strategy can define an organization’s success in the digital age. During a 2018 Mandela Washington Fellowship Institute (MWFI), social media was used to raise its Internet profile while also extending Oklahoma State University’s brand worldwide. The MWFI’s broad aim was to provide learning experiences for 25 entrepreneurs (“Fellows”) from 20 Sub-Saharan African (SSA) countries and to stimulate ongoing collaborations with U.S. businesses and the university community. Most Fellows were either agricultural entrepreneurs or food purveyors. They came to Oklahoma State University for a six-week-long, summer Institute, including topical presentations, enterprise shadowing, service-learning experiences, leadership development, and cultural activities. The 2018 Institute was the university’s second. The Fellows were among 700 from SSA dispersed among 28 Institutes and chosen from 37,000+ applicants. The Institute used social media to promote its participants and program. Functional building blocks of social media, i.e., “the honeycomb of social media” (Kietzmann, Hermkens, McCarthy, & Silvestre, 2011, p. 243), served as the study’s conceptual frame, especially in regard to considering identity, conversations, sharing, relationships, and reputation.

Purpose/Objective
The study sought to assess Oklahoma State University’s efforts in using social media to promote its 2018 MWFI.

Methods/Data Sources
The Institute used social media to raise awareness about its programming and the 25 Fellows who participated in such. The Institute’s Facebook page was active in organically sharing participants’ posts, was available to be tagged by other accounts, and actively used hashtags to interact with users. Facebook was the most active platform, and it promoted content associated with the Fellows’ learning experiences and activities, including spotlights on individuals, i.e., #FellowFridays, beginning in Week 2 of the Institute. Posts were available for shares by the Fellows via personal pages and enabled them to keep families and friends up-to-date about their activities.

Fellow Fridays were generated to create interest in the Fellows themselves and allowed followers to identify and place stories with names and faces. These posts were shared by the Fellows and their online networks to generate a worldwide reach. Fellows’ entrepreneurial pursuits, backgrounds, and educational aspirations were included in the posts, along with a professional headshot. The Fellows also shared posts of newfound friends attesting to their
skillsets and personalities, and introduced citizens of different countries to one another through the Internet. Comments of support and praise for the Fellows’ posts occurred frequently, and reactions, including the “like,” “love,” and “wow” emoticons, were numerous.

To assess the Institute’s digital reach based on post type, post typology was studied by dividing the posts into main categories or purposes. Three post types were identified based on content: achievement posts, event and experience posts, and Fellow biography posts. Post typology analysis is a growing area of interest because results can reveal strategies to boost an entity’s social media presence. Sabate, Berbegal-Mirabent, Cañabate, and Lebherz (2014) analyzed post typology based on timeframe and content richness. However, de Vries, Gensler, and Leeflang (2012) and Coelho, de Oliveira, and de Almeida (2016) proposed models in which the typologies are based on content type, or what information the posts are designed to share. We analyzed sharing of the Institute’s posts by type, as based on their content.

Selected Results/Conclusions
By using Facebook’s metrics such as people reached, countries reached, shares, like, comments, and counting those individuals who inquired by private messages, the performance of each post type was analyzed. Our best performing individual post with 1,799 people reached, 193 engagements, and 3 shares was a #FellowFriday post. Its successful promotion relied on the Fellow’s personal network “sharing,” “liking,” and commenting on the post. The next two most successful posts relied on interacting with local businesses and reaching out to our university’s surrounding community. Those organizations had webpages that interacted with our posts, which drew attention and support from people within their respective online networks. Using social media networks as maintained by other entities was a goal of the 2018 Institute.

Recommendations/Implications/Educational Importance
Facebook is recommended as an effective social media platform for promoting a MWFI or a similar program. Results also support more use of the Institute’s most effective post type overall – event and experience posts. To improve the sharing of an Institute’s biography posts, an individual’s and the program’s prestige should be highlighted as much as possible, i.e., burnish their reputations within the respective online communities (Kietzmann et al., 2011). Finally, Institutes should budget for qualified staff to effectively establish and maintain their social media platforms (Kietzmann et al., 2011).

References


Introduction
The ability to produce certain crops year-round is one of the greatest advantages of protected agricultural systems such as greenhouses, which enable producers to grow products out of season and thereby acquire market and price advantages (SIAP, 2017). However, production per unit in greenhouses is usually more expensive than field agriculture (Dalrymple, 1973). Nevertheless, greenhouse designs have improved over time with changes calibrated to minimize costs while providing optimal growing environments, including for tomatoes (Jaimez, Costa, Palha, Salazar, & Araque 2015). In the case of Sinaloa, Mexico, tomato production in greenhouses had a significant impact on the region’s economy, making the phenomenon worthy of historical analysis.

Purpose
This inquiry’s purpose was to investigate the introduction of greenhouses for tomato production in the State of Sinaloa, Mexico, including its economic benefits and the related implications for other regions where similar technology may be an appropriate tool for development.

Methods/Data Sources
In historical research, an attempt is made to reconstruct what occurred during a specific time period with as much accuracy and detail as possible. This method is analytic-synthetic and relies on examining a phenomenon’s constitute parts to reveal the forces and motives underlying it, and thereafter create an explanatory synthesis (Langlois & Seignobos, 1965). Textbooks, encyclopedias, newspaper articles, chronicles, and literature reviews can be appropriate sources of data for historical inquiries. Such were collected and examined for goodness and credibility (Tobin & Begley, 2004), and subjected to external and internal criticism to establish authenticity and accuracy of this study’s findings (McDowell, 2002). Most of the data were retrieved using Internet search engines provided by the main library at Oklahoma State University. Some key search terms were greenhouses in the State of Sinaloa, history of greenhouses, history of Sinaloa, protected agriculture, State of Sinaloa, and tomato industry.

Selected Findings
Sinaloa’s farmers became major exporters of tomatoes during the 20th century. Their strategic market was and remains the United States (Calzada, 2015). The cultivation of tomatoes, including field production, has always required large sums of money (Hernández, 2000). In the late 1970s, the Mexican government’s Commission for the Development of Marginalized Areas (COPLAMAR) promoted the construction and use of greenhouses in Sinaloa (Loredo, 2015; Pacheco, 2006). A first, all were wooden structures and covered with plastic film (Loredo, 2015). Over time, new materials and machinery was introduced to automate certain tasks, the modernization of packing occurred, and cooling and gassing was adopted to achieve targeted ripening objectives (Pacheco, 2006).
Other technological innovations included the use of fertigation together with plastic mulching (Carrillo, 2015; Mayorga, 2010; Pacheco, 2006). Greenhouse production and hydroponic technologies allowed tomato farmers to take better advantage of inputs, and reduce risks of diseases and pests, which positively impacted their production (Beltrano & Gimenez, 2002). Challenges to vegetable production in open fields, such as inclement weather, pests, and the need for improved efficiency, also contributed to the rapid development of Mexico’s protected agriculture sector (de Grammont, 2010).

These growing systems generated more employment per hectare than conventional agriculture which stoked regional development and improved peoples’ livelihoods (Bernal, Rumayor, Perez, & Reyes, 2010; Victoria, Van der Valk, & Elings, 2011). Today, Sinaloa stands out as the Mexican State with the most protected horticulture; it is estimated that more than 6,000 hectares were under production in 2016 (Goldense, 2016). Most tomato producers have invested large sums in greenhouse technology; they are well-organized and well-structured entrepreneurially, have a strategic vision, have established corporate offices, and have a financial development and marketing infrastructure (Robleño, 2006). Sinaloa has established itself as the first tomato producer in Mexico, with the production of 937,796 tons valued at slightly more than 4 billion pesos (>200 million USD) in 2017 (Amarillas, 2018). The sector is an important source of jobs and foreign exchange for the region and nation (SIAP, 2017).

**Conclusion/Recommendations**

Tomato production in Sinaloa, especially after the introduction of greenhouse systems, has contributed to the economic livelihood of thousands of people in its rural areas (FAO, 2013; FIRA, 2016). Additional research is needed to explicate the lessons learned during Sinaloa’s emergence as Mexico’s leading tomato-producing region. This could inform policymakers struggling to improve other regions with similar development needs. “Good practices are successful experiences that have been tested and replicated in different contexts and can therefore be recommended as a model” (FAO, 2018, p. 1). However, such practices require rigorous documentation which may be achieved through methods of historical research (McDowell, 2002).

**References**


Integrating Gender-Sensitive Participation in Sustainable Intensification Research

Kenrett Jefferson-Moore  
Paula E. Faulkner  
North Carolina Agricultural and Technical State University  
Shahana Begum  
Bangladesh Agricultural University  
V. Bougouma-Yameogo  
Nazi Boni University of Bobo-Dioulasso  
Socheath Ong  
Royal University of Agriculture  
Fentanesh Fenta  
Bahir Dar University

Introduction
With nearly one billion people living in extreme poverty (The World Bank, 2018), often relying on farming for meager livelihoods, and a growing population competing for limited land and water resources (FAO, n.d.), there is an urgent need for a systems approach in developing appropriate-scale mechanization to advance sustainable intensification (SI) for smallholder farming systems. Inclusive SI approaches include integrated pest management, conservation farming, crop rotation, agro-forestry, improved timeliness in farm activities and precision application of seeds, fertilizer, herbicide, and water require technologies at appropriate scales. Sustainable intensification requires timely field operations, accurate planting, precise and timely weeding, and efficient crop harvest and storage. Sustainable intensification must be based on an understanding of the seasonal sequence of field operations and their effect on subsequent tasks. In many cases, the management practices associated with sustainable practices can require significant demands on labor and management expertise, which is normally performed by males. Gender-based task designations are constraints to promoting intensification. Since women’s time and energies are spread thinly (The World Bank, 2018), manual tasks like seeding and weeding are often delayed, even though the lack of timeliness can greatly reduce yields. This study seeks to increase the number of women during sustainable practices. This study is a part of a multi-institutional research effort, the Appropriate Scale Mechanization Consortium (ASMC), focused on gender-sensitive participation of women farmers in Bangladesh, Burkina Faso, and Cambodia.

Purpose and Objective
The main purpose of this study was to collect baseline data to help to identify and focus on farming systems where women are often overlooked and strategies increase their participation in sustainable research. The objective developed to guide the study is to determine if improved mechanization could mitigate critical labor bottlenecks, thereby improving timeliness, crop production, worker safety and health, and farm profitability for the women farmers.

Methods
The study was conducted June 2017- December 2018 respective to country timelines, needs, and available resources. Gender Specialists in Bangladesh, Burkina Faso, and Cambodia. Each specialist administered was provided a script to use for the focus group sessions (60-90 min).
The focus groups focused on participants’ status, successes and challenges experienced, and what opportunities exist in agricultural mechanization. Data was collected video recorder transcribed and then analyzed.

**Results and Conclusions**

The results based on Bangladeshi focus groups (n=6), to address integrating gender sensitive participation in sustainable projects with women (n=54), found they felt low empowerment. They also felt the need to change their traditional beliefs and attitude toward gender inequity. Results from trainings and demonstrations (n=8) held in Burkina Faso with women farmers provided training on the proper use of seeders and drills in order to design the tools to be ergonomically friendly. The study continues to learn the level of adoption, and barriers of use. In Cambodia, women farmers (n=39) participated during workshops and trainings on the proper use of machinery (i.e. no-till planters, broadcasters, roller crimpers). The women farmers noted the advantages of seed planter technology and the need for addressing gender roles in the agricultural mechanization sub-sector. No data was provided from Ethiopia. From the study’s results, it was concluded women farmers desire receiving short and long-term training programs, demonstrations, pilot testing and technology knowledge. Based on the expressed needs of the women farmers. The researchers conclude the project’s capacity building will help to ensure that the interventions put in place will continue to be sustained after the project ends September 2019. This approach will foster trust in agricultural research, increase research participation, address issues of greatest importance to the communities, and aid in the translation of research results into useful practice.

**Recommendations and Implications**

Based on the conclusions, the researchers recommend that more education and training be provided to women farmers and for their spouses to improve knowledge and skills for the use of technology, tools such as planters and machinery to reduce drudgery. In addition, more focus groups (i.e. gender sensitization) will be held to focus on the importance for women being involved in daily decision-making with support of men in the household and community. The implications of this study are imperative as supported by Sreelata and Antony (2012), who offered, “the nature of women's manual labour has changed little in many developing countries for centuries, either because technologies and innovations haven't catered to their particular needs, or because they are inaccessible or unaffordable” (p. 1).

**References**


A Qualitative Assessment of Concerns from Four Watershed Communities in Trinidad and Tobago

Introduction
Watersheds of Trinidad and Tobago are under threat, particularly those within the Northern Range. The legal and illegal clearing of land, illegal occupation of land, agriculture, logging and quarrying have resulted in destruction of the watersheds (National Environmental Policy, 2017). Despite there being legislation specifically drafted to protect various aspects of the environment in Trinidad and Tobago, little collaboration among institutional and non-institutional stakeholders exists (National Environmental Policy, 2017). The lack of collaboration often times presents itself in the limited inclusion of community members who may be directly impacted or affecting the watersheds in terms of decision-making activities.

Purpose and Objectives
This study sought to determine perspectives on watershed management problems from four watershed communities in Trinidad and Tobago, in an effort to develop suitable approaches towards addressing watershed problems.

Methods
This qualitative study was guided by an interpretative theory, grounding the researcher in the context of the participants (Webster & Ganpat, 2006). Focus group discussions therefore were conducted in the Northern Range communities of Lopinot, Guanapo, Maracas/ St. Joseph and Mausica, using three closed-ended guide questions to stimulate discussion.

Responses from the focus groups were analysed utilizing In-vivo coding, following steps prescribed by Saldaña (2011). Relevant themes were developed and used to describe watershed issues from the community’s perspective. Peer review of the transcripts ensured trustworthiness and neutrality of the data, and participant quotes were included to provide evidentiary support.

Results
Theme 1: Environmental Degradation. Participants discussed environmental degradation from two points of view. Firstly, they considered environmental degradation due to the actions of persons who were not from within the community and secondly, because of the actions of persons who were from within the community. Environmental degradation due to the actions of persons, who were not from within the community, was supported by responses such as:

“They (quarry operators) widen the road on one side and then dump on the dirt on the other side, just leaving it there. What you think happens when they do not remove the dirt? It goes into places it is not supposed to be, either the river or when it is the dry season, the dust floats on the air” (Participant 1, Guanapo).

Environmental degradation due to the actions of persons who from within the community, was supported by responses such as:

“Residents are cutting the lands on the hillside, and this causing the water in the river to be lower” (Participant 1, Lopinot).

Theme 2: Unsustainable Agricultural Practices. Poor agricultural practices featured as the main type of unsustainable agricultural practices, with the potential to give rise to health issues, water pollution and loss of wild life. This was supported by responses such as:
“Spraying spraying...a practice I am totally against...a set of thing we ingesting like chemicals. The farmers get lazy and depend too much on the use of agricultural chemicals because they afraid of insects”. (Participant 1, Lopinot).

Theme 3: Governance/ Institutional Pitfalls. The majority of the discussions highlighted projects being started by government agencies and remaining incomplete. Participants felt that law enforcement personnel are not performing their duties efficiently and inadequate law implementation allows negative environmental practices to take place. This theme was supported by responses such as:

“Incomplete work by government agencies. They come and start something, and to me it remains unfinished or incomplete” (Participant 2, Mausica) and “Poor implementation of laws regarding the use of the forest...if people are charged for doing the wrong thing, then they would stop” (Participant 4, Lopinot).

Theme 4: Social Stressors. Participants asserted that in most instances, people were the main culprits in that, their actions tended to have adverse effects on the surrounding environment. This was supported by responses such as:

“Religious people and local tourists using the river for whatever purpose leave their garbage behind just like that. The locals have no respect for their surroundings. You do not get this problem with international tourists” (Participant 4, Lopinot) and “People come and interfere with the natural course of the river. What you think happens when this is done? Is trouble for us who from the area.” (Participant 1, Maracas/ St. Joseph).

Implication and Recommendation
The focus group discussions emphasized that, more is needed to done regarding educating persons about the impact they have on the watersheds either knowingly or unknowingly. If this is not done, serious environmental degradation issues stand to be the outcome. The need for aggressive education and awareness campaigns, dialogue and participatory approaches geared towards bringing about positive attitude changes are required.

References
The Potential and Role of an Extension Service in the Provision of Sustainable Farming Practices in Gressier Region of Haiti for Alleviating Hunger and Poverty

Abhimanyu Gopaul
Joseph J. Molnar
James R. Lindner
Auburn University

Introduction
Food insecurity is a challenging issue in Haiti. The rural economy is highly dependent on agriculture, with 65% of the population earning a livelihood from it, which is mostly subsistence farming. The productivity of local farming is constrained by the dominance of small-scale subsistence farms (averaging 0.5ha), weak and non-existent extension services. Sustained economic growth of a country was found to be closely associated with its initial or simultaneous agricultural development. The Ministry of Agriculture and Rural Development of Haiti agricultural policy has ensured a minimum basic agriculture public service very often insufficient compared to the requirements. Government agricultural programs were unable to provide necessary resources and assistantship for supporting sustainable increase in productivity. There were lack of centralized agricultural research and extension planning function. The Ministry of Agriculture in Haiti has been relying heavily of the private sector and NGOs for research and extension. Agricultural extension is considered as a structured exchange of knowledge aiming to help rural families to develop their skills required to solve their immediate problems and improve their lives. The lack of rural infrastructure, agricultural extension, and research has stunted agricultural innovation, access to markets, and the development of rural enterprises. The rural farmers worked in isolation spatially distributed across the regions with no help and support. Participation of people in achieving rural developments programs faced great challenges. The situation exacerbated by the sharp increase in international food, fuel and fertilizer prices along with farmers losing their assets and agricultural output in the recent storms and earthquakes during the year 2008 and 2010 respectively. This led to migration of people from the urban and capital which was seriously damaged, to rural areas causing a dramatic influx of people increasing the pressure on food security. This study proposed two theoretical frameworks, the adoption and diffusion theory and transformational education and applied them to the Haitian context as a case study. Research on strategies dealing with low adoption of agricultural innovations revealed that extension agents in the rural areas were inadequate and ineffective. Transformational education was also considered as a framework for describing the most effective way for implementing outreach education programs.

Purpose
The purpose of this study aimed at developing an appropriate framework for the establishment of a functional extension system with key stakeholders. The case study addressed how to implement an extension service network for the provision of technical information to the farming community. The objectives of the study were to: identify projects for combating malnutrition and hunger in the region of Gressier, provide solutions for tackling the poor communication network hindering the farming community in improving agricultural productivity, develop a framework to support adult education in the surrounding community and outline the activities of the extension agents and desired outcomes for alleviating and poverty.
Methods
The methods and data sources used in this study were based on the findings derived upon the development of Experiential Learning Modules, a work undertaken in Haiti under the USDA funded project “Solving problems of Food Insecurity and Human Suffering in Haiti and Beyond”.

Results
Results revealed that the agricultural sector would benefit from the establishment of a well-functioning extension service system to improve agricultural productivity of rural farmers through dissemination of agricultural information that would catalyze rural development. Experiential Learning Modules are instructional educational materials based on the four adaptive modes of the Kolb’s Learning Cycle. They addressed and identified related needs to food insecurity and human sufferings and contributed towards formulating outreach extension programs for addressing the problem of food insecurity in the region. Using existing agricultural educational facilities at Christianville Foundation Inc (NGO) as a pilot study, trained agriculture students graduating from the CVET (Christianville Vocational Training school) constituted a pool from which potential extension agents that can be trained to disseminate agricultural information in the Gressier region. A logic model was developed for the provision of an extension service for the region of Gressier with a budget narrative. The rational of this study was to influence future policies and developmental projects for providing extension services as well as the type of extension services.

Implications
The implications of this study were to attract the interest of the local government and international funding institution to support the setting up of an extension system that is vital to the socio-economic activities of the rural areas of Gressier. The expected outcomes related to findings include a fully functional extension system in place contributing towards increasing agricultural productivity through improved sustainable practices, thereby improving the livelihood and food security of the rural community.

References
Christoplos, I. 2010. Mobilizing the potential of rural and agricultural extension. Food and Agriculture Organization of the United Nations, Rome, Italy


Agricultural Development Storytelling: An AgriCorps Qualitative Exploratory Study

Lacey Roberts
Tobin Redwine
Taylor Rogers
Texas A&M University
Raegan Pugh
Assemble
Morgan Bullock
Texas A&M University

Introduction

Storytelling has been a part of society since mankind first began to communicate. Verbally or visually, stories connected generations, passed down information and continue to do so today (Banks-Wallace, 2002; De Groot & Zwall, 2007; DeLarge, 2004; Robin, 2008).

Groups of people have used stories to share personal and cultural identities, customs, and beliefs. Stories are a tool used to communicate and demonstrate leadership. (Harris & Kim Barnes, 2006; Robin, 2008; Sawhney, 2009). Looking specifically through an agriculture development lens for this research, De Groot & Zwaal (2007) and Silver (2001) highlight areas of healthcare and conservation that utilize storytelling. By utilizing stories to break down complex ideas, sharing new agriculture practices and technology in agriculture development is feasible (Barker & Gower, 2010; Cunsolo Willox, Harper, & Edge, 2012; DeLarge, 2004; Forster et al., 1999; Harris & Kim Barnes, 2006).

Research has called for intercultural approaches to stories and two-way exchange, as opposed to single lenses (De Groot & Zwaal, 2007). Finding better ways to tell stories in appropriate settings is still needed in development today.

Contextualized examples of storytelling are applied in myriad fields. However, in the current forms of storytelling used to disseminate information, experiences are not always a part of the model (Barker & Gower, 2010; DeLarge, 2004; Sarica & Usluel, 2016). Additionally, international agricultural development is underrepresented. What would a model of storytelling look like that incorporated immersive cultural experiences, and international agricultural education? How do we tell stories about the challenges and successes of international agricultural and extension education?

Purpose and objectives

The purpose of this study is to explain the role of storytelling and how it is implemented in international agricultural education settings. We used two research questions to guide inquiry: 1) how does storytelling in international agricultural development manifest? and 2) how do immersive experiences inform the discipline of storytelling?

Methods

The population consisted of eight AgriCorps teaching fellows who were working in Ghana (n=6) or Liberia (n=2), during the 2017-2018 academic year. AgriCorps is a US-based non-profit
educational organization that establishes 4-H and FFA chapters in Ghana and Liberia by placing recent graduates from western universities in year-long teaching fellowships. AgriCorps was purposefully chosen because AgriCorps teaching fellows are uniquely tasked with teaching in an international setting, immersion in a new culture, and creating content for marketing and storytelling purposes. In many cases, these are entirely new tasks for the fellows.

Data was gathered using naturalistic inquiry with no manipulation. We implemented written metacognitive reflections to capture participants' sentiments and perceptions about their storytelling behavior during their immersive international agricultural education experience. Participants were given guiding prompts for metacognitive reflection and completed and delivered their reflections electronically.

Data was analyzed using open and axial coding in a constant comparative method described by Merriam and Tisdell (2015). Open codes were first used by three researchers who manually sorted 130 discrete codes comparing the initial codes to each other. After initial codes were sorted into groups, each researcher compared groups to begin narrowing down the findings.

Findings and Conclusions
Three major themes emerged regarding storytelling in international development. Nine subthemes were found to support and further describe the major themes. Researchers synthesized these findings and knowledge base from the literature to conceptualize a model of Experiential Storytelling. The first three major themes: a) documenting the experience, b) sharing the experience, and c) reflecting on the experience, each work harmoniously to contribute to a holistic view of experiential storytelling.

The first theme, documenting the experience, explores ways participants clarify and articulate specific moments of meaning. This theme included subthemes of mindfulness and journaling as means for documentation.

Sharing the experience included specific mentions of the act of writing as a response to moving documents of an experience toward two-way communication and exchange. This theme is further characterized by subthemes of practice and mechanics of writing.

The final theme, reflecting on the experience, includes the importance of pensive observation to complete the storytelling process. Further characterizing this major theme, subthemes of connecting to others, introspection and reporting emerged.

Recommendations
The Experiential Storytelling Model illustrates how storytelling manifest in international agricultural educators. Organizations should plan for these experiences, particularly in immersive and educational settings. Experiences are required to tell an accurate and engaging story. Organizations can train volunteers entering into field work to become storytellers.

Future research is needed to quantify the Experiential Storytelling Model. Creating an instrument to test this model will aid in its transferability through multiple contexts.
References


Behavior-Based Safety and its Applications in Organizational Settings

Dr. Austin Burrow  
BASF Agricultural Solutions  
Seeds Innovation Center

Dr. Courtney Gibson  
Dr. Matt Baker  
Dr. David Doerfert  
Dr. Jeong-Hee Kim  
Oyugi Millicent Akinyi  
Texas Tech University

Introduction
In organizational leadership, we teach a relation between leader behavior, follower attitudes, and performance outcomes (Yukl, 2013). There are common performance outcomes (Howell & Costley, 2006) with some being positive (greater worker performance) and others negative (absenteeism, workplace injuries, turnover).

Behavior-Based Safety (BBS) analysis has provided insight into the complexities of understanding human behavior as it relates to safety incident prevention in many work environments (Morris, Todd, Midgley, Schneider, & Johnson, 1990). BBS is composed of three branches: (a) behaviorism, which focuses on the philosophy of behavior analysis; (b) the experimental analysis of behavior to identify the basic principles and processes that explain behavior; and (c) applied behavior analysis (ABA) which focuses on solving problems of social importance using BBS.

BBS has been adopted by many organizations over the past thirty years (Geller, 2001a). Unsafe acts cause 88% of accidents in the workplace by employees (Heinrich, Roos, & Peterson, 1980). According to Geller, Williams, and Safety Performance Solutions (2001) their clients who adopt BBS receive a 22% improvement in their injury rate within the first year, a 72% improvement after five years, and after seven years, a 79% improvement in their injury rate after implementing BBS.

Purpose and Objectives
The purpose of this study was to conduct an exhaustive literature review to: (1) describe the historical development of BBS programming and (2) describe the safety applications of BBS in the workplace.

Methodology
The researchers obtained secondary data through a desktop review to gain a broader understanding of the historical development of BBS and its significance within the implementing organizations. This was one part of a larger study conducted in 2017 at a cotton seed delinting plant for GMO cotton.

Results of the Study
The systematic means of understanding human behavior includes many approaches; however, behavior-based and person-based are the two most commonly referenced (DePasquale & Geller, 1999; McSween, 1995; Petersen, 1989; Ward, 2000, Baer, Wolf & Risley, 1968). The behavior-based approach (e.g. behaviorism) undergirds BBS principles (Geller, 2001a; Geller, 2016). B.F. Skinner (1938) is credited as the father of behavior-based analytics and greatly contributed to our current understanding of how and why individuals behave in certain ways when exposed to various environmental influences. Many scholars agree with Skinner’s philosophy of behaviorism (Catania, 2007; Fisher, Piazza, & Roane, 2014; Krause, 1997; Geller, 2001b; Cooper, 2009). However, Fisher, et al. (2014) alludes that this concept is in opposition to cognitive psychologists, who view thinking and other internal events as the sole entities that effect or control one’s behavior.

Geller’s safety-triad has guided safety incident investigation methodology to identify the person, behavior, and environmental conditions that may have contributed to a single incident. A review of history on the safety movement, however, reveals how the primary source of inquiry in regard to accidents, began with engineering controls and design that did not focus on education and enforcement (Peterson, 1991; Winn & Probert, 1995; Haddon, 1968; Geller, 2001b; Agnew & Daniels, 2010; Geller, 2016).

BBS is designed to promote a safety culture in the workplace through safety performance. Safety culture and safety climate in the organizational environment has been explicitly advanced by Glick (1985), Lewin, (1951), and Mead, (1934). Since the beginning of the U.S. Occupation Safety and Health Administration (OSHA) in 1971, regulations to ensure the safety of employees have catalyzed the development of safety programs. There are many safety programs to date in U.S. driven by OSHA rather than by the employers at-risk and employees who are legally responsible for the safety of their workers (Geller, 2001a).

Work practices can be observed, tracked, and recorded objectively in most workplaces (Geller, Lehman, & Kalsher, 1989; Krauss, Hidley, & Hodson, 1996; McSween, 1995). BBS has enhanced effective communication within organizations and the usefulness of human interactions in the workplace (Malott, Shimamune & Marlot, 1993; Sturmey, 1998).

Conclusions and Recommendations
Numerous scholars agree that direct observation is the gold standard against which to evaluate the accuracy of indirect measures (Fisher et al., 2014; Beaver & Busse, 2000; Merrell, 2000). BBS programs were developed so that the science of psychology could be implemented to promote safe behaviors in the workplace. The development of ABA programs has evolved to create both behavioristic and humanistic focused-programs. However, it is best used when safety professionals implementing BBS programs possess the knowledge and understanding of how these programs have come into existence.

References


Linking GPS Data Acquisition Tools with Survey Research in Agricultural and Extension Education

Raphael M. Gikunda
Juma R. Magogo
David E. Lawver
Texas Tech University

Introduction and Conceptual Framework
Global Positioning System (GPS) is a worldwide navigation satellite system that gives the location of a position on or near the earth (Krenn, Titze, Oja, Jones, & Ogilvie, 2011). The geolocation information is captured by a GPS receiver. GPS receivers are extensively used in agriculture and its potential is rising. Its uses on the farm are numerous including yield mapping, field mapping for insurance and records, variable rate planting, and variable rate lime and fertilizer application (Quot, Quot, Alley, & Heatwole, 2009). In research, GPS receivers are widely used to survey the population's time-spatial behavior because of its ability to track individual’s movement in space (Murakami & Wagner, 1999). Milla, Lorenzo and Brown, (2005) posit that GPS technologies has proved to be a crucial tool for monitoring and managing agricultural and natural resources. Auld, Williams, Mohammadian, & Nelson, (2009) observed that GPS tools can be combined with interviews to form rich hybrid approaches. The spatial visualization capabilities of data collected through GPS offer a method for examining and displaying a phenomenon in the field of Extension Education.

Purpose and Objectives
The overall objective of this article is to outline the value of linking GPS devices with semi-structured/structure questionnaires to gather spatial-temporal data in Agricultural and Extension Education. It also documents the lessons learned from integrating the device with the survey.

Method/Procedures
GPS survey data collection process involved GPS and a farmer questionnaire. The GPS units were used for recording farm household positions (waypoints), which were later exported to a file for processing after the fieldwork. The questionnaire was used for recording waypoint information and farm-related data which were then linked together in an excel sheet for processing. Prior to data collection exercise, the team was assembled and trained on both GPS device use and content of the questionnaire. After the training, the team was allowed time to practice the use of GPS units and also questionnaire administration in both English and the local language. The GPS/questionnaire data in excel sheet were cleaned by filling in the missing data and deleting redundant entries. The excel data were then cleaned, converted to a CSV table and exported to a shapefile for analysis.

Results
Through the enumerators had not used the GPS devices, before they learned how to use them within a short time out of short training that they got in two days. Very minimal mistakes were witnessed, the majority of which could be dealt with through proper training and practice. GPS/questionnaires data enabled the researchers to examine spatial patterns and generation of maps that help the reader to conceptualize spatial distributions and spot spatial outliers. The
spatial data enabled the researcher to establish spatial relationships and clusters among study variables. The technologies made it possible for the analysis of trends in certain practices in agriculture to identify thrust and future directions in the development of those practices (Anselin, 1994). Additionally, spatial data allowed the construction of spatial models that facilitated the running of regression analysis among other inferential statistics.

**Educational Importance, Lessons Learned, and Implications**

GPS as a research tool affords researchers an opportunity to not only integrate classical and spatial data but also for the generation of maps to ease visualization of results thus bringing new perspectives to our scholarship and our understanding. Spatial data is suited for studies aimed at establishing spatiotemporal characteristics (Taczanowska, et al., 2012) of the study participants, mapping out trends and analyzing spatial patterns of the subject being studied. The tool bonded well with the surveys which involved the use of semi-structured questionnaires. The instruments allowed space for recording the spatial data collected via GPS. This minimizes the possible confusion that might arise when the data from the same study is recorded in separate sheets and afforded the researchers an easier time in managing and processing the data.

**References**


Technology Adoption in Southern Nations, Nationalities, and People’s Region (SNNPR) of Ethiopia

Carla Andrea Millares Forno
Fátima Diaz
Amy E. Boren Alpízar
Melisew Dejene
Hawassa University
Conrad Lyford
Texas Tech University

Introduction
Ethiopia is the fastest growing economy in Africa. Investment in the agricultural sector, construction, and services are some of the key elements of the country’s success (World Bank, 2018). Poverty levels have also been reduced from 45% in 2000 to 23.5% in 2016 (UNDP, 2018). Though this country has experienced unprecedented growth, Ethiopia remains one of the poorest countries on the African continent (World Bank, 2018). In particular, areas related to agricultural growth and gender equity need to be strengthened (UNDP, 2018).

The adoption of new technologies among small farmers can increase productivity (Meara et al., 2015) and may enhance gender equity (Mwangi, Meinzen-Dick, & Sun, 2011). Studies suggest that there is a relationship between adoption of new technologies and the reduction of poverty (Mendola, 2007). In spite of this, the rate of new technology adoption in developing countries is low (Mwangi & Kariuki, 2015). There are several studies that have explored the reasons for low rates of adoption (Mwangi & Kariuki, 2015), but no studies have examined Ethiopian women’s perceptions of technology adoption.

This study attempts to understand the willingness of women to adopt technologies that will benefit them and the barriers that may affect this process. This study used as a conceptual framework the Model of Five Stages in the Innovation Decision Process (Rogers, 1983). This theory recognizes five main stages in the decision of adopting a new technology: Knowledge, Persuasion, Decision, Implementation, and Confirmation. It is important to understand the Innovation Decision Process among women in developing countries, such as Ethiopia, to diffuse useful technologies that can reduce poverty and enhance gender equity.

Purpose and Objectives
The purpose of the study is to measure and describe the perception that women from the Southern Nations, Nationalities, and People’s Region (SNNPR) have toward the adoption of new technologies. The following objectives were created:

1. Describe the demographic characteristics of the population studied.
2. Describe the willingness to adopt new technologies based on education level.
3. Assess the perceived benefit of adopting new technologies by Ethiopian women.
4. Determine the barriers that Ethiopian women face when adopting new technologies.
Methodology

For this quantitative study, data were collected in 2014 from a randomized sample in twenty districts (woredas) of the SNNPR in Ethiopia. Overall, 11,243 women responded to the 400-item survey. Enumerators were used to ensure everyone could participate regardless of their literacy level. Data were analyzed using SPSS v. 24 and the following statistical analyses were conducted: descriptive statistics, correlations, and Chi Square.

Results

Results for objective one showed that 38.4% of the women were between 25 and 29 years of age, and 42.6% of the women were illiterate. While 59% of the women owned land, most did not make decisions regarding its use.

Objective two aimed to evaluate the willingness of Ethiopian women to adopt new technologies. Overall, women from the SNNPR demonstrated a willingness to adopt new technologies regardless of their literacy level.

Objective three assessed the perceived benefit of adopting new technologies by Ethiopian women. Health improvement, increased productivity, and overall life improvement are the three most frequent benefits as perceived by women in this region.

Objective four sought to determine the problems that Ethiopian women face when adopting new technologies. The biggest barriers to adopting new technologies included the contradiction between modern technologies and the subjects’ religion, followed by the price of adopting the new technology.

Conclusions and Recommendations

This study can be used as a baseline to understand the willingness of women in the SNNPR to adopt new technologies, the main barriers to adoption, and the impacts new technologies have on their lives. According to Rogers (2003), the decision to adopt new technologies is based on people’s previous knowledge. Even though all women were open to adopting new technologies, women with a higher level of education were found to be more willing to adopt new technologies than the other groups, which emphasizes the importance of education in the process.

This information can be used for future projects in the region focused on the adoption of new technologies. This study can be replicated with people from different regions of Ethiopia to see if the perception is generalized or just focused in this group. Additionally, men could be included into the sample to determine the impact of gender in the new technologies’ adoption.

References


Introduction

When teaching in international contexts, general words seem imperative when teaching or trying to understand a concept. However, with language barriers, sometimes words are not enough to communicate a concept. As educators we know it is vital to use diverse methods to adhere to different learning styles. One way to do this is using photographs. Photographs provide depth to the ideas and thoughts of educators and participants. Some of the most ancient stories are told and passed on from visual artifacts of pottery and sculpting, as well as pictures of these historical marks. Why not get back to the basics of photovoice to teach and learn from each other, especially with the ever changing technological advances?

Photo learning contributes to critical thinking skills that expound far beyond what the eye can see. “They communicate far more than mere words. In fact, words are helpful only as they conjure up a picture in our minds” (Elmore, 2004, p.1). When people relate photos to stories about content, they are more susceptible to regurgitating the material. It can also be assumed that many people will have many different outcomes of opinion and idea as to what the photo represents. “Photography has been deployed to represent, evaluate, classify, codify, document, prove, and to synthesize scientific truths about human diversity” (Pollack, 2011, p.79). Not only is imagery used as an eye appeasing tool, but for historical information and documentation. It reveals the population’s diversity and history. Photos bring people together, by teaching similarities and respect for differences.

Vocal communication can be a deterrent to some teaching and learning abilities. Banks & Zeitlyn (2015) suggest that photos are a form of resolution in diverse communicative environments. “There is now an abundant research literature from within cultural studies and most social science disciplines that specifically address visual forms and their place in mediating and constituting human social relationships, as well as discussing the visual presentation of research findings through film and photography” (Banks & Zeitlyn, 2015, p. 2). Yang and Hsu (2017) studied design education, which promotes learning via visual communication design (VCD). Communication skills and visual creativity are imperative to be successful in teaching students the art of interpretation without using vocal language (Yang & Hsu, 2017).

Purpose

The purpose of this abstract is to highlight an innovative model of educational programming, VCD, which can be implemented in any context and in any setting.

Methods

VCD was the premise of three different projects participants presented to their peers. On an international experience, participants were taught the importance of the culture’s art history by viewing a variety of original pieces made by various artists. The meaning behind each painting...
was explained and discussed. Following the history of the art and their artists, participants were
asked to communicate their vision by designing an abstract piece as the historical artists did. The
designs were then communicated amongst the other participants. The participants were also
asked to take a photo of their depiction of what leadership is. Then, they had to connect their
personal photo to a leadership theory and explain their reasoning behind the photo.

In a different VCD study, participants were asked to find existing pictures from magazines that
explained different aspects of leadership. The photos were cut and pasted on a board to form a
visual collage of their depictions. The reasoning behind the particular photos chosen on the
collages were explained and discussed with the other participants.

Results
Visual Communication Design has been an effective teaching method for adult learners in local,
regional, country, and international contexts (Yang & Hsu, 2017). Facilitators have experienced
an increase in the quality and quantity of interactions between the participants and between the
participants and facilitators after completing a VCD activity.

Implications
The use of photovoice and photo elicitation as a research method, in international contexts, is
gaining recognition, but many of those studies use the experience only to study the participants,
not to educate them (Leggette, Hall, & Murphrey, 2017). Using photo voice/VCD as a teaching
method allows international agricultural educators to engage their participants in a unique
manner and to connect new material to a concrete experience.

References
Sage.
Growing Leaders.
participation in a Cochran Fellowship Program focused on Biotechnology and
unconscious and philosophy. na.
Yang, C. M., & Hsu, T. F. (2017). New Perspective on Visual Communication Design
Education: An Empirical Study of Applying Narrative Theory to Graphic Design
Courses. International Journal of Higher Education, 6(2), 188.
Global Mindedness of Pre-Service Agriculture Education Students at North Carolina State University: A Pilot Study

Emma Cannon
Jim Flowers
Joy Morgan
Marshall Baker
North Carolina State University

Introduction and Theoretical Framework

Globalization affects current and future agriculture students in their personal and professional lives (Chang et al., 2016) and it is reported students are increasingly entering the workforce underprepared both personally and professionally (Association of American Colleges and Universities, 2002). In colleges of agriculture, a shift has been called to meet the changes caused by global integration, new science, consumer influence, environmental concerns, demographic, and political shifts (National Research Council, 2009). The need to reform their undergraduate curricula and student experience to meet the needs of the changing world because they are uniquely positioned to fill the gap providing a model for other disciplines to follow (National Research Council, 2009; Estepp and Roberts, 2011). When preservice teachers have a short-term global experience, the content and context of their instruction are impacted by their newfound empathy to those, not like themselves (Willard-Holt, 2001). Internationalizing teacher education has a direct effect on a teacher’s classroom communication skills and student learning (Walton, 2002).

The study utilized a global mindedness instrument originally developed by Hett (1993) which measures five constructs: responsibility, cultural pluralism, efficacy, global-centrism, and interconnectedness. Cultural pluralism is defined as people who value diversity and multiculturalism (Golay, 2006). Efficacy can be defined as a belief that one individual has the ability to make a difference in the world (Hett, 1993). Global-centrism is defined as thinking about good for the global community more than good for oneself (Hett, 1993). Interconnectedness refers to globally minded people who are aware of the connection between themselves and the rest of the world (Hett, 1993).

Purpose

The purpose of this study is to explore the global mindedness of pre-service agricultural education students at (State) University. This study aligned with the American Association for Agricultural Education Research Agenda, Priority 3 – Sufficient Scientific and Professional Workforce that Addresses the Challenges of the 21st Century (Stripling & Ricketts, 2016). The study is guided by one primary research question:

• What are the attitudes of the pre-service undergraduate agricultural education students at (State) University towards global mindedness?

Methods

This descriptive census study targeted a population of pre-service undergraduate agricultural education students at (State) University in the fall semester of 2017 (N=68). The scale used to measure the dependent variable of global mindedness was a five-point Likert-type Global
Mindedness Scale (Hett, 1993), and the researcher selected 10 of the 30 questions targeting the constructs of interest to this study. The five constructs being measured by the instrument were responsibility, cultural pluralism, efficacy, global centrum, and interconnectedness. The Cronbach’s alpha score for the constructs were -0.59 responsibility, 0.72 cultural pluralism, 0.75 efficacy, and 0.58 for global centrum. The researcher reports a limitation in the low Cronbach’s alpha, but for larger populations, the instrument has proven to be reliable in similar populations (Hendrickson, 2015; Smith, Jayaratne, Moore, Kistler, and Smith, 2010). The data were analyzed using SPSS software to compute measures of variability (Privitera, 2017).

Findings and Conclusions
The mean construct scores for the Global Mindedness Scale (n = 43) were 3.65 for responsibility, 3.98 for cultural pluralism, 3.6 for efficacy, 2.60 for global centrum, and 4.36 for interconnectedness. With a population of (N = 68) and a return rate of (n = 43) the researcher acknowledges some limitations in describing the population with a 66% response rate.

The students reported the highest in global centrum but held the lowest mean of interconnectedness as well as others. Data indicated students have a strong sense of responsibility when it comes to understanding global awareness, however, the students have a hard time understanding that global awareness is more than the country they originate from. Students need to understand the interconnectedness of cultures and global thinking and realize that agriculture is a global industry. Students reported to only slightly value cultures other than their own (cultural pluralism) and didn’t score very high in efficacy.

Recommendations
The ultimate goal is to increase the global competency of teacher candidates, who will integrate topics related to global agriculture successfully into their agricultural education program, seek additional global opportunities, and have increased empathy for students from varied backgrounds. The topic of global awareness should be incorporated within all subjects as we seek to prepare students who will be able to compete in a global society. Teacher educators should teach how to integrate global concepts into curriculum to demonstrate the interconnectedness of agriculture. This integration will provide students experiences and exposure to perspectives from the inside the classroom.

References


The Assessment of Training Needs of Mississippi State University Extension Agents in Organic Agriculture

Thamir N. Al-Janabi
Kirk A. Swortzel
Marina D. Denny
Susan D. Seal
Donna J. Peterson
Mississippi State University

Introduction
[STATE]’s number one industry is agriculture, employing approximately 29% of the state’s workforce either directly or indirectly, while also generating 7.6 billion-dollar annually ([STATE] Department of Agriculture and Commerce, 2017). Organic agriculture is an ecological production management system that promotes and enhances biodiversity, biological cycles and soil biological activity. It is also based on minimal use of off-farm inputs and on management practices that restore, maintain and enhance ecological harmony (Gold, 2007).

Purpose
“[STATE] harbors a high culture of industrial agribusiness. Within the last ten years, [STATE] has seen a surge of small-scale farmers interested in growing organically and selling locally.” (Nassif, 2014, p.1). [STATE] State University Extension is working to help existing non-organic growers convert at least some of their production to organic methods or to assist those who want to begin organic production ([STATE] State University Extension, 2017). Unfortunately, knowledge and support for organic agriculture among Extension agents is limited within the Southern region of the United States, even though Extension agents’ knowledge about organic production is essential in moving the organic industry forward (Sanderson, 2004). The purpose of the study was to determine the training needs of [STATE] State University Extension agents in organic agriculture.

Methods
The population of this study consisted of all [STATE] State University Extension agents in all 82 counties (N = 154). A survey was developed that consisted of 29 organic agriculture topics identified from the literature. Agents were asked to rate the importance of each of the 29 topics and their current level of knowledge on these topics using a Likert-type scale. The Borich (1980) model was used to determine the priority for the training of [STATE] State University Extension Agents in organic agriculture based on a weighted discrepancy model. The model utilizes a formula to calculate the mean weighted discrepancy (MWD) of each of the 29 organic agriculture topics:

\[ I = \text{Importance rating} \]
\[ K = \text{Knowledge rating} \]
\[ N = \text{Number of observations} \]

Formula: \( I \times (I-K) = \text{Weighted Discrepancy Score (WDS)} \)

\[ \text{Sum of WDS} = \text{Mean Weighted Discrepancy (MWD)} \]
\[ \frac{N}{N} \]
The weighted discrepancy score (WDS) could range from +12 to -3 based on the rating scales used in the survey.

**Results**

The MWDs ranged from 3.64 to 5.57. According to the Borich (1980) model, higher MWDs are an indication that respondents need more training in these topics, and lower MWDs are an indication that respondents need less or no training in these topics. Using the mean weighted discrepancies for Extension agents to establish training priorities, MWDs of 5 and above should be considered highest priority. Following are the MWDs of the 29 organic agriculture topics, listed in order of highest to lowest training needs:

- Appropriate amounts of bio-fertilizers to use in organic agriculture (5.57),
- Appropriate amounts of IPM in organic agriculture (5.56),
- Organic certification (5.49),
- Organic agriculture standards (5.39),
- Types of bio-fertilizers used in organic agriculture (5.36),
- Post-harvest handling techniques in organic agriculture (5.33),
- Labeling of organic products (5.32),
- Steps in utilizing bio-fertilizers in organic agriculture (5.27),
- Steps of utilizing IPM in organic agriculture (5.15),
- Benefits of bio-fertilizers used in organic agriculture (5.14),
- Different types of organic agriculture production systems (5.13),
- Weed control practices in organic agriculture (5.11),
- Benefits of IPM in organic agriculture (5.08),
- Types of organic fertilizers (5.04),
- Appropriate amounts of organic fertilizers (5.02),
- Steps in utilizing organic fertilizers (5.00),
- Marketing organic produce (4.79),
- Integrated Pest Management (IPM) practices used in organic agriculture (4.70),
- Harvesting practices in organic agriculture (4.67),
- Benefits of organic fertilizers (4.64),
- Crop rotation systems for organic agriculture (4.62),
- Types of organic agriculture equipment (4.45),
- Using biofuel in organic agriculture (4.39),
- How to transition from traditional practices to organic practices (3.89),
- Growing row crops organically (3.84),
- Raising livestock organically (3.77),
- Growing produce organically (3.70),
- What is organic agriculture (3.69), and
- Benefits of organic agriculture (3.64).

**Recommendations**

There are several practical and research recommendations from this study. First, there should be continued and enhanced formal and/or non-formal education and training opportunities, workshops, and seminars relating organic agriculture for [STATE] State University Extension agents so they are better prepared to assist producers in the state. Additionally, agents should try to collaborate with organic farming networks and organizations and establish relationships.
Future research could include study about the knowledge and attitudes of [STATE] farmers about organic agriculture practices as well as study about the interest of 4-H youth in organic agriculture practices.

References
International Service-Learning Study Abroad: A Transformational Experience

Dale Pracht
Kate H. Fletcher
Caroline Cully Garbers
University of Florida

Introduction
According to Black, Moore, Wingenbach, & Rutherford (2013), future research needs to expand the existing relationships between universities and non-governmental organizations (NGO). Specifically, observing the interactions between students, faculty, and NGOs to better understand the practical impacts of the international service-learning (ISL) experience in college of agricultural and life sciences study abroad programs. International components of curricula have grown in popularity and importance in colleges of agriculture (Graham, 2012). Research suggests that it is essential to incorporate both service-learning and study abroad experiences into the same program of study (Black, Moore, Wingenbach, & Rutherford, 2013). Service-learning has a positive effect on understanding of social issues, personal insight, and cognitive development (Yorio & Ye, 2012) and has become a teaching practice used to decrease emphasis on individualism, increase civic responsibility, and feelings of inclusion within a community in students (Harder, Bruening, Graham, & Drueckhammer, 2009). During the summer of 2018, there were 19 UF students who participated in the youth development ISL study abroad program to Galway and Gweedore, Ireland. These students completed approximately 240 hours of ISL during a six-week study abroad program, which included four weeks of individualized youth development placements with NGO’s in Galway, and approximately two weeks of a team-based community youth development center placements in Gweedore. In addition to the ISL component of the Program, the students were also required to complete guided journals, weekly group reflections, pre-departure and mid-program interviews.

This study replicated both Rockquemore and Schaffer’s (2000) and Pracht’s (2007) studies to see if the following six stages of cognitive development occurred. These stages included shock, guilt, normalization, cultural sensitivity, engagement, and empowerment.

Purpose and objectives
1. Understand student motives behind ISL study abroad program.
2. Understand student attitudes toward civic responsibility and feelings of inclusion within a community of students during an ISL study abroad program.
3. Assess social issues, personal insight, and the six stages of cognitive development students experience during an ISL study abroad program.

Methods
The researchers utilized a mixed method research design. Journals were analyzed utilizing Constant Comparative Method – Grounded Theory (Glaser and Strauss,1967). Students completed both a semi-structured pre-interview in the spring semester before leaving campus for the study abroad program, a mid-point program interview, and a post-interview at the end of their individual Galway placements using axial coding to organize codes into themes and subthemes (Strauss & Corbin,1990; Saldana, 2013). From analyzing the ISL from an ISL study
abroad program, it is assumed that each student was truthful when answering each of the guided journal questions and interviews. It is also assumed that the instruments are reliable and valid when measuring student’s attitudes regarding ISL.

**Results**

While all 19 ISL students completed the Program, 18 of the 19 students agreed to participate in this study. Preliminary results indicate: Objective 1: Students participated because they had some service-learning involvement prior to the program. Objective 2: Students wanted to be helpful, most students did not have any concerns prior to the program, and student responses tended to be very self-focused and not necessarily focused on the community. Objective 3: continued coding is currently underway to see if these emerging themes align with the six stages of cognitive development and will be completed by presentation time. The current themes emerging include: bonding (living arrangements, relationships, NGO placements), discovering their passion/purpose, reflecting (personal and group reflections), safe spaces (discrimination and racism), emotions (feelings, expectations, empathy, and comfort zones), and the importance of acclimating and orienting to a new environment.

**Recommendations**

This study should be replicated in other comparative ISL study abroad programs to further validate the themes that have emerged. This study should be replicated in a setting where students have not previously completed service-learning to validate the relationship findings found in this study. This study should be replicated comparing student groups from year to year on this program and compare other ISL study abroad programs in colleges of agricultural and life sciences. These findings should be replicated and published. The final recommendation is for future research to also include the Identity Stage of Development in the Psychosocial Stages of Development (Erikson, 1959).

**References**


Examining the Decision-Making Process Pertaining to Public Understanding of Agricultural Systems

Alexa J. Lamm  
University of Georgia  
Joy N. Rumble  
Ohio State University  
Jason D. Ellis  
Kansas State University

Introduction
A lack of trust in science is pervasive in many developed countries, yet scientific agricultural breakthroughs have proven to be a solution to food insecurity in the developing world. How the public makes decisions about agricultural and natural resource (ANR) issues is complex and multi-dimensional (Trowler, 2012). While extensionists share science and fact, personal decision-making involves emotion, ethics, morals and politics (Cook, Pieri, & Robbins, 2004). Ruth, Rumble, Lamm, Irani, and Ellis (in press) introduced a theoretical model for decision-making about ANR science combining the Theory of Diffusion (Rogers, 2003), the Spiral of Silence (Noelle-Neumann, 1974) and the elaboration likelihood model (Perloff, 2014). The model could have implications for how extensionists can educate about technology adoption around the globe but must be tested to determine effectiveness.

Purpose and Objectives
The purpose was to test two components of the model (perceived Diffusion characteristics and Spiral of Science attributes) using attitude toward genetic modification as the ANR science of interest. It was guided by the following objectives: (a) describe respondents’ perceptions of the five Diffusion characteristics; (b) describe respondents’ perceptions of the Spiral of Silence attributes; and (c) identify the direct and indirect effects of both on attitude toward GM.

Methods
Using non-probability sampling, an online survey collected data from 1,046 respondents in the U.S. The diffusion characteristic items were researcher-developed and spiral of silence items were adapted from Noelle-Neumann (1974). The survey was expert panel reviewed and pilot tested. Relative advantage, compatibility, trialability, perceptions of future trends, perceived opinions of others, and willingness to expose attitude were measured using five-point Likert-type scales (1 = strongly disagree; 5 = strongly agree). Five-point semantic differential scales were used to measure complexity and observability (1 = low; 5 = high) and attitude toward GM (1 = negative; 5 = positive). Relative advantage had eight items, compatability six items, trialability five items, perceptions of future trends seven items, perceived opinions of others eight items, willingness to expose their attitude six items, complexity six items, observability six items, and attitude toward GM eight items. Each set was averaged to create reliable index scores (系数 > .70). Descriptive statistics and structural equation modeling (SEM) were used. The Chi-square test of model fit was significant.

Results
The respondents expressed a neutral attitude toward GM science ($M = 2.52, SD = 1.06$), were neutral regarding the perceived observability of GM ($M = 2.69; SD = .98$), complexity of GM ($M = 2.69; SD = .78$), compatibility of GM ($M = 3.27; SD = .71$), and trialability of GM ($M = 3.27; SD = .53$). Respondents agreed GM had a perceived relative advantage ($M = 3.59; SD = .79$). Respondents were neutral regarding perceived future trends ($M = 3.30; SD = .83$), opinions of others ($M = 2.98; SD = 1.08$), and agreed to exposing their attitude ($M = 3.51; SD = .73$). The direct and indirect effects were identified using SEM. Perceptions of future trends was a significant predictor of attitude ($b = -.74$). Willingness to expose was not a significant predictor of attitude but was a significant predictor of future trends ($b = .07$). Perceived relative advantage, compatibility, and trialability were all positive direct predictors of perceptions of future trends; therefore, they also had an indirect effect on attitude toward GM.

**Conclusions and Recommendations**

The findings suggested the public examined in this study (a developed country) is neutral about GM. Perhaps this is because they do not completely understand GM science and what it can do for world hunger, as expressed by their inability to agree or disagree with the perceived diffusion characteristics. However, when the variables were examined in the model predicting attitude toward GM, three of the perceived diffusion characteristics did have a significant effect. In addition, the perception of future trends predicted attitude. The findings imply extensionists need to drive future trends by encouraging conversations about GM, making scientific information more readily available and assisting the public in connecting GM science to their everyday lives.

This study should be replicated in a developing country to examine the differences in public attitude and what drives the formation of that attitude where food is not readily available and GM is viewed as a solution. The study should also be replicated using a different technology as the dependent variable. Perhaps examining a new water conservation technology or food safety protocol would elucidate further understanding of how the public makes decisions about agricultural systems.

**References**


Perceived Barriers Affecting Extension Agents’ Personal Resilience in Post-Hurricane Response: Implications for Extension Practitioners

Amanda D. Ali
T. Grady Roberts
Amy Harder
University of Florida

Introduction
Burnout and compassion fatigue are common among disaster responders, negatively influencing effective post-disaster response (Burnett & Wahl, 2015). Burnout is a component of compassion fatigue that deals with emotional exhaustion and low personal accomplishment among disaster responders (Maslach & Jackson, 1984). Burnout symptoms include physical exhaustion, behavioral changes, and psychological stress (Igodan & Newcomb, 1986). In post-disaster response, Extension has a responsibility as a support organization (Telg et al., 2008). Agents involved in post-hurricane response should be ready to deal with clients’ needs, however, personal stress can hinder their ability to effectively respond (Telg et al., 2007; 2008).


Purpose and Objectives
The purpose of this study was to explore challenges UF/IFAS Extension agents experienced while involved in post-hurricane response. The objective was to describe perceived barriers affecting agents’ ability to respond to client-needs post-hurricane.

Methods
A basic qualitative design explored how Extension agents interpreted their experiences with hurricanes. Purposive sampling was used to select UF/IFAS agents who were personally or professionally affected by a hurricane, as determined by experiencing losses related to valued objects, personal conditions, energies, or personal characteristics (Hobfall, 2001; Paul et al., 2013). Saturation determined the sample size resulting in nine agents. A semi-structured interview guide developed from burnout and personal resilience literature (e.g. Igodan & Newcomb 1986; Maddi 2013) guided face-to-face and telephone interviews.

Interviews conducted in August and September 2018 occurred with approval from the University of Florida’s (UF) Institutional Review Board. UF’s contact for Extension Disaster Education Network provided a list of agents involved with post-hurricane response after Hurricane Irma; snowball sampling provided additional participants. Interviews lasted 45 minutes. Questions
focused on stress and job demands. Member-checks ensured credibility. A two-cycle coding process (Saldaña, 2013) facilitated data analysis. Structural coding summarized data and identified sub-themes during first cycle coding. First-level themes were pre-determined by the conceptual framework. Pattern coding identified category labels and attributed meanings to themes during second cycle coding (Saldaña, 2013).

Results
First level themes were identified as stress (mental, emotional, physical), performance deficits, and perceived lack of motivation. Under stress, mental and physical fatigue was a common sub-theme. “As a single parent, having to leave my kids to fulfill my role, it’s a little bit stressful” shared Lynsey. “People that participate in the emergency operations center are expected to report days before an expected disaster and work during the event, so you’re in lockdown, and then stay after the event” (Jenny). Sub-themes under performance deficits were having good support systems and undefined roles. A good support system helped manage job demands, however undefined disaster roles posed a conflict between state and county responsibilities. “I have my responsibility with the county, but I needed to be at a conference right after the hurricane. I needed to be there as I was presenting. So, definitely a conflict of what do I do” (Lynsey). An emerging theme of performance deficits was new agent experiences. For some agents, Irma was the first hurricane they experienced. It was stressful as they were unclear of how to assist with disaster relief. Feeling unfocused was a sub-theme under lack of motivation. Cindy said, “I wouldn’t say unmotivated. I would say divided, just not being as effective because there’s this to do over here. Definitely felt unfocused.”

Conclusions and Recommendations
Agents involved with disaster response experienced different levels of stress consistent with burnout literature (Igodan & Newcomb, 1986). Making responsibilities known can help reduce agents’ mental stress, especially for first-time agents involved in post-hurricane response. Feeling unfocused was consistent with feeling pulled between professional and personal demands (Telg et al., 2007). Agents found difficulty dealing with personal demands while fulfilling professional roles, compounded by unclear expectations and available resources. Extension should provide agents with clear disaster roles and responsibilities, and promote available resources delivering support to cope with disasters. Other Extension systems in hurricane-prone countries may benefit from implementing similar strategies.

References


Introduction and Conceptual Framework
Krutka, Carpenter, and Trust (2016) posited Personal Learning Networks (PLN’s) may create an environment in which teachers can simultaneously learn and share in a reciprocal fashion. Multiple approaches exist in which teachers engage and participate in their PLN, each of which is unique to the individual’s motivation (Krutka et al., 2016). Discovery encompasses the exposure to ideas, resources, and methods as a result of PLN’s that were not part of a teacher’s specific quest to answer an individual question. Experimentation refers to the testing of new discoveries. Reflection addresses the consideration of outputs and changed behavior. Sharing denotes the teacher’s individual contributions in the form of knowledge, skill or resources.

Facebook can help teachers engage in informal professional growth and allows users to join and follow groups which align with their personal interests (Rutherford, 2013). Users can engage in conversation relating to user generated topics, justifying participation in Facebook and other online informal learning groups as valid sources of professional development for teachers (Trust et al., 2016). Although literature related to Facebook is capacious, a lack of research in practicing teacher’s use of Facebook emerges (Rezende da Cunha, van Kruistem, & van Oers, 2016).

Purpose and Objectives
The purpose of this study was to gain insight into teachers use of their PLN, and the role of Facebook in teacher’s informal professional development needs and usage.

Methodology
A qualitative content analysis approach was utilized to conduct a review of discussion posts, comments and resources shared within the [Name] Ag Education Discussion Lab Facebook group, from its inception in June 2016 to the last post prior to the beginning of this study on August 24, 2018. There were 419 members in the group, of which, it is believed members are current or past agriculture educators at the preservice, secondary or post-secondary level. All subjects in the group are adults. All posts and comments in the group were transcribed by the researcher in an effort to ensure saturation of data to increase trustworthiness (Merriam & Tisdell, 2016).

Approximately half way through transcription a list of participants was created and sorted alphabetically by first name, then each member was assigned a number starting at the top of the list with 101. As transcription continued more names were added to create a comprehensive list of all 99 participants. Each post and its corresponding comments were numbered, starting with 1, and continuing chronologically after the groups creation.
Results
The content of discussions in this study in which teachers were attempting to pursue personal needs, leveraging collective wisdom, creating a culture of growth, and self-reflecting, surrounded topics relating to the three circles of agriculture education. Although many school sites have social media sites blocked, literature has shown that teachers are using these platforms as a means to attain informal professional development on topics of specific interest to them. The topics of the conversation in this study were directly related to secondary agriculture education, and therefore can be considered a valid form of informal professional development because it meets their own learning objectives on their timeline (Nussbaum-Beach & Ritter Hall, 2012).

The theories and models can be combined and organized to explain the emergent themes of the findings of this study including need-based pursuance of knowledge and skill, leveraging collective wisdom, a culture of growth, and self-reflection. The most notable connections relate to the model created by Krutka et al. (2016), and its web of interconnected elements of teachers use of their PLN. The five areas outlined by the researchers can be applied to each individual teacher and their use of their PLN. Each teacher brings forth their own background and experience to their unique agriculture education program. Because each teacher is using their PLN in a way that’s unique to them, in each discussion post there are often several elements occurring in a single post and its comments as described by Krutka et al. (2016).

Recommendations and Educational Importance
Based on the findings of this study and literature, further study with a more in-depth approach may reveal greater complexities of how teachers are using their PLN’s, and what role the discussion groups play in their professional development continuum. Study of school administrators views of social media platforms as part of the teacher professional development continuum compared to teachers use of these resources may provide insight into creating a more effective approach to formal and informal professional development for teachers in secondary agriculture programs.

References


The Cultural Dynamics of Food Insecurity Among Farming Households in Oyo State, Nigeria

Bisi-Amosun, O. Olamide
Linda J. Pfeiffer
Mark A. Russell
Jennifer L. Johnson
Mark A. Tucker
Purdue University

Introduction
Most of the world’s poor are farming households who live on less than $2 a day and make up half of the world’s undernourished people although they produce four-fifths of the food in developing countries (International Food Policy Research Institute [IFPRI], 2017; The World Bank, 2016). This makes the agricultural sector a front-runner in tackling food insecurity mainly through improved agricultural productivity (Food and Agriculture Organization [FAO], International Fund for Agricultural Development [IFAD], & World Food Programme [WFP], 2002; Mandyck & Schultz, 2015; Thurow, 2016).

The recent decline in progress towards achieving global food security has led to the realization that the adoption of an economic approach is ineffective (FAO, IFAD, United Nations Children’s Fund [UNICEF], WFP, & World Health Organization, 2017). This implies that increasing income does not necessarily translate into better nutritional status (Popkin, Adair & Ng, 2012) as food-related decisions are rooted within the context of cultures and social structures (Weingärtner, 2004; Fanzo, 2015). There is however a limited understanding of the relationship between culture and food insecurity in developing countries like Nigeria because most research on food insecurity are economically driven and quantitative, which may not reflect the reality of how the phenomenon occurs within cultural contexts (Jerven, 2013).

Purpose and objectives
The study’s purpose was to explore cultural factors that play a role in food-related behaviors among farming households in Oyo state, Nigeria. The specific objectives were to:

1. Describe the food production, consumption and distribution patterns among farming households
2. Explain the role of cultural norms, values and beliefs in the food-related behaviors of farming households

Methods
The study adopted a qualitative methodology and participating households were purposively selected based on type of marriage (polygamy/monogamy), religion, land size, and marital status. Participant observations and interviews were the data collection methods used. The time spent in each community was approximately four weeks – the first two were spent conducting observations and informal interviews, findings from these activities were adapted into a guide, which was used for interviews during the last weeks of the study. Forty-four farming households participated in the study and the person(s) in charge of making food-related decisions was interviewed in each household. Interviews were audio-recorded, transcribed by a third-party
transcription service, and imported into Nvivo 11 for data analysis. Interview transcripts were analyzed inductively and deductively to identify emerging themes and patterns.

**Results and Conclusion**

Results of the study showed that agriculture is rain-fed and unmechanized in the farming communities. Men make food production decisions, and these decisions are usually based on climatic and soil conditions, crop marketability, and household food preferences. Intercropping of maize, cassava, yam, legumes (cowpea or groundnut) and/or leafy vegetable is the farming practice adopted by most households. The main meal of preference in both communities consists of yam pudding, vegetable and palm oil soup eaten with meat/fish. They however eat foods made from cereals and/or legumes during hunger season (usually a few months to harvest) when they cannot afford meat/fish. Yam is the most valuable crop, its consumption is an integral part of cultural identity and its cultivation is one of the determinants of social status among farming households.

Priority is given to husbands when meals are shared, older household members are served before younger members, and wives usually eat last and/smaller food portions when food is insufficient. This is based on the belief that the husband regardless of his age is the head of the household, children learn contentment and respect by not consuming as much food (especially meat/fish) as elders, and mothers should be sacrificial.

The study concluded that cultural norms and values are major drivers of food consumption and distribution within farming households. Further, intra-household food distribution is based on cultural beliefs and norms, therefore, members of the same household may differ in terms of food insecurity and/or nutrient deficiency depending on their gender and age.

**Recommendations**

Food-related behaviors at the household level are influenced by an intricate network of factors rooted within the cultural context of farming communities. It is imperative that development practitioners understand the cultural dimensions of food insecurity in order to ensure the adoption of a holistic approach that takes into account economic as well as non-economic factors that have an impact on household food security.

Nutrition education is recommended for farming households in Oyo state, Nigeria to enhance sustainable and equitable food security. Agricultural development initiatives in the region should include nutrition programs that enlighten farming households on caloric needs based on the age and gender of individuals.

**References**

Introduction and Theoretical Framework

Extension plays a critical role in the development of African countries, and extension professionals are key players in the development process (Msuya et al., 2017). The effectiveness of extension services is highly dependent on the preparedness and professional competencies of extension professionals (Jasmin et al., 2013; Okoedo and Edobor, 2013; Hoffmann, 2014). For any extension organization to improve its performance, continuous and systematic training of extension professionals is necessary (F.A.O. 2001). One area of training importance to extension professionals is adult learning. According to Malcolm Knowles, andragogy is the art and science of adult learning (1984). The theoretical framework used for this study was Knowles et al (2005) andragogy in practice model.

Purpose and Objectives

The purpose of this study was to determine the perception of extension workers in Malawi and how the incorporation of andragogy centered professional development could be used and viewed as tools to design and facilitate more effective extension programming. The objectives of the study were to:

1. Determine the perception of extension programming in Malawi.
2. Determine how programs could be modified using andragogy principles.
3. Determine how the integration of andragogy could impact extension programming.

Additionally, this study was supported by the USAID-funded Strengthening Agricultural and Nutrition Extension (SANE) project in Malawi.

Methods

Participants in this study consisted of Malawi extension professionals and university students preparing to become extension professionals at the Lilongwe University of Agriculture and Natural Resources (LUANAR). The participants completed a two-day professional development training designed to help extension professionals and students design educational programming based on the principles of andragogy. The interactive workshop provided participants with the knowledge and skills to apply adult learning principles, experiential learning concepts and learning style preferences to current and future programming. Each participant selected one current program outline to redesign during the workshop. At the conclusion of the professional development, participants were divided into two groups and two focus groups were facilitated, audio recorded, and transcribed verbatim. Each group included 10 participants with mixed male and female participants for a total of 20 participants. A semi-structured interview protocol
developed as part of the professional development training was used during the focus groups. Data analysis was conducted using Grbich’s (2007) block and file approach that allows for themes to emerge based on reoccurring words and phrases. Trustworthiness techniques (Lincoln & Guba, 1985) were used to provide rigor to the study. To help ensure transferability (Dooley, 2007), multiple researchers were used and rich descriptions were provided. Methodological journaling was used to help assure dependability and conformability.

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

The following themes emerged from the study: a) using andragogy to change the negative perception of extension in Malawi to a positive perception, b) andragogical principles should increase the effectiveness of extension programing, and c) time, energy and resources are needed to develop an impactful extension professional.

Using andragogy in program design encourages extension professionals in Malawi to focus on the participant of the adult education program, enabling the adult education program to center on the issues that the program participants are currently facing (P15). As ownership of the adult education program shifts from the extension professional to program participants, the program participants will begin to feel like they are truly a critical component of extension (P4; P7; P11; P13; P14). In turn, more people will participate in extension programming and begin to view extension in Malawi positively (P3). Additionally, participants felt that using andragogical principles would help extension professionals to provide programming that is highly valued, problem-centered, and will meet the needs of the clients (P9; P12). Participants felt that andragogical principals will help to develop a more holistic extension professional, but the development of a more holistic extension professional will require more time and energy to develop and more time and energy will be needed to design adult programming (P6; P19).

**Recommendations**

Participants in this study felt professional development designed to help extension professionals incorporate andragogical principles is critical to creating a positive perception of Malawi extension. The SANE project in Malawi is currently working with extension professionals to improve extension programming. We recommend scaling up professional development focused on designing and implementing programs based on andragogical principals, and to provide continued support to extension professionals once they begin implementing newly designed programing. Extension professionals also need to have blocks of time to specifically design and redesign adult programing based on the principles of andragogy.

**References**


Planning and Delivering a Mandela Washington Fellowship Institute for Entrepreneurs from Sub-Saharan Africa: Oklahoma State University’s Experience

Mahamane Cissé
M. Craig Edwards*, Ph.D.
Craig E. Watters, Ph.D.
Alexander J. Smith
Luis A. Flores
Michaela R. Clowser
Oklahoma State University

Introduction
Progress in health care coupled with a high fertility rate has created a population explosion in Sub-Saharan Africa (SSA) while employment opportunities remain dismal for millions of young job-seekers (Filmer & Fox, 2014). These potential workers often lack the means to translate their education into livelihoods. The youth in SSA represent the largest demographic group; more than one-half of the region’s population is under the age of 18 (Fox, Senbelt, & Simbanegavi, 2016). Unfortunately, this potential is overlooked or misused because of public policies that do not provide young people with the entrepreneurial and leadership skills to develop businesses and create jobs. Pursuing President Obama’s commitment to Africa’s future, in 2014, the White House promoted the Mandela Washington Fellowship (MWF), the flagship program for the Young African Leaders Initiative (YALI) (“Young African,” 2014).

The MWF intends to capacitate young African leaders through academic coursework, leadership training, and networking (“Young African,” 2014), which is accomplished through Institutes, as provided by U.S. institutions of higher education funded by a competitive grant seeking process. Oklahoma State University’s 2018 MWF Institute (MWFI) featured business and entrepreneurship training, including topical presentations, enterprise shadowing, and site visits to agribusinesses and farms. The Institute was almost six weeks in duration. Most of the 25 participants or “Fellows” (15 males; 10 females) were either agricultural entrepreneurs or food purveyors, 25 to 35 years of age, and came from 20 nations. They were among 700 from SSA and chosen from more than 37,000 applicants.

Purpose/Objective
The poster presentation will describe the planning and delivery of a MWFI, as conducted by faculty and students at Oklahoma State University during 2018.

Methods
The methodology used in the Institute’s planning phase was a conflation of Waterfall and the Project Management Body of Knowledge (PMBoK) set of standard guidelines. It owes to Waterfall the sequential approach taken (Balaji & Murugaiyan, 2012) while borrowing from PMBoK the five stages of initiating, planning, executing, monitoring and controlling, and closing projects (Thomas & Adams, 2005). The project’s team used a course on project management, as co-taught by the two faculty members who led the Institute, to provide its preliminary planning. Students were assigned weekly themes for which to develop the Institute’s “at-a-glance” schedule and partial budgets for such. They also identified topic presenters as well as site visits.
and cultural excursions befitting the Institute’s broad aims. Thereafter, the faculty leaders and four graduate students supported by the project finalized the Institute’s schedule through meetings and iterative modifications. Faculty and students of Oklahoma State University’s College of Agricultural Sciences and Natural Resources and its School of Business (SSB) presented topics and/or facilitated related learning experiences during the Institute. All were unpaid volunteers in that regard.

**Selected Results/Conclusions**

The project was jointly planned and delivered by members from two academic departments and a center for entrepreneurship at Oklahoma State University. The Fellows had learning experiences during which they collaborated and interacted with faculty members and students, representatives of the Stillwater, Oklahoma business community, numerous Oklahoma entrepreneurs, and service providers supporting entrepreneurship. Five major themes were addressed: creativity and service, business foundations, ethics and leadership, communication and marketing, and capital generation and money management. More than 30 topics were presented to the Fellows and 20-plus site visits occurred. The Fellows also participated in numerous enterprise shadowing experiences as individuals, small groups, or as one unit. The shadowing experiences were intended to match the Fellows’ entrepreneurial interests and related business ventures in their home countries. Examples range from a vertically integrated, family-owned egg layer farm to an aquaponics project to a restauranteur who also exports food products to international markets.

**Educational Importance/Implications/Recommendations**

The long-term impacts stemming from a MWFI stand to be enormous, including growth in economic livelihoods, improved well-being of communities and nations, as well as positive changes regarding cultural stereotypes or misconceptions held by Fellows and U.S. citizens. However, follow up inquiries – quantitative and interpretive – are needed to assess such. Moreover, agriculture is highly diverse around the world, including in the United States. Oklahoma has exemplary sectors, but it also has limitations or even non-existent sectors in which Fellows may be interested. So, providers are challenged to seek out analogous production processes or enterprises intended to meet Fellows’ entrepreneurial interests. This, however, requires more advance work by the funder who places the Fellows and an Institute’s providers. Such may prevent a serious mismatch from occurring. Other lessons learned by the Institute’s providers will be shared during the poster’s presentation.

**References**


Leadership Development Needs Assessment for Penn State Extension

Mariah Stollar
Suzanna Windon
Pennsylvania State University

Introduction
There is a need for a systematic leadership development program for Extension that considers input from Extension professionals and recognizes their efforts (Bruce & Anderson, 2012; Ladewig & Rohls, 2000; Woodrum, 2003). The literature review showed that Extension leadership development is important for all Extension employees; various populations, including specialists, new educators, and experienced educators, were evaluated (Bruce & Anderson, 2012; Nistler, Lamm, & Stedman, 2011; Radhakrishna, 2001; Ricketts, Carter, Place, & McCoy, 2010; Stedman & Rudd, 2006; Woodrum, 2003). Successful leadership development programs exist for regional and national levels. However, only selected individuals by state are given the opportunity to be part of this program each year (University of Minnesota, n.d.). State-centered leadership development programs require more attention because they provide accessibility to all state Extension employees.

[University] Extension has been a pioneer in Extension organizational restructuring efforts, beginning these efforts in October 2011 ([University] Extension, n.d). An Extension business model and new cross-cutting program teams were created ([University Stat Extension, n.d.). New teams require intentional effort to build trust, manage conflicts, and efficiently collaborate. The newly created Extension cross-cutting program teams need accessible leadership development trainings to successfully serve Extension customers and stakeholders.

Purpose and Objectives
The aim of this study is to assess [University] State Extension leadership development needs with the purpose of creating an accessible leadership program for all Extension employees in the future. The research objective is to identify leadership development needs for [University] State Extension employees.

Methods
A qualitative method will be used to address this study objective. The researchers will use a modified brainstorming technique to assess leadership development needs for [University] State Extension employees. The researchers developed an open-ended questionnaire based on the literature review. Five Extension administrators helped established face validity of the questionnaire to ensure questions’ relevance to the organization. The final instrument is summarized below.

• What are the leadership development opportunities available to [University] State Extension leaders and educators?
• What are the strengths of current leadership development opportunities provided to Extension leaders and educators?
• What limitations and barriers surround the development and support of Extension leaders and educators?
• How do you think Extension personnel would describe the quality of available
leadership development opportunities?

• Do you think a new training program could improve leadership development for Extension leaders and educators?

Authors will use a brainstorming writing approach instead of a group discussion. Participants will have the opportunity to review other responses and provide additional thoughts or ideas. This writing brainstorming technique will help to avoid criticism or rewarding ideas and synthesize diverse experiences, which will foster collaborative problem and solution generation. A step-by-step approach of a modified brainstorming technique is provided below:

1. Establish and provide a comfortable meeting environment.
2. Present the problem based on the literature review and describe the purpose of the session.
3. Introduce audience to the writing brainstorming technique.
4. Participants will have 20 minutes to silently complete the five open-ended questions.
5. Participants will have also an additional 10 minutes to provide new ideas or thoughts generated by reviewing two other participants’ answers.

Participants
Twelve [University] State Extension administrators will participate in this study.

Data Collection
Data collection and data analysis will occur in November 2018. We will analyze data using NVIVO software. Findings will be shared with the [University] State Extension leadership team. In addition, the results of this study will inform a broader statewide needs assessment strategy.

Conclusion
In November 2018, we will complete this phase of the leadership development needs assessment with this audience. Acceptance of this abstract will give us an opportunity to share pertinent findings from the modified brainstorming session with [University] State Extension administrators. More specific implications based on findings will be provided during the conference poster session if this proposal is accepted.

Implications
Maintaining human capital development involving team-building and collaboration for the 31 newly created [University] Extension cross-cutting program teams is essential. The results of this study cannot be generalized across the Extension organization because the population was limited to the state of [state]. However, our recommendations based on results could be valuable for similar organizations. The actual study will be conducted in November 2018 and implications will be shared during the conference.

References


Impacts on Global Perspective of Peace Corps Volunteers

Tegan J. Walker
James R. Lindner
Auburn University

Introduction
Several studies have shown the impact international experiences have on one’s global perspective (Radhakrishna, Leite, & Hill, 2003; Tritz & Martin, 1997; Zhai & Scheer, 2002). Various international experiences such as short term study abroad, semester long study abroad programs, personal travel, and foreign service learning programs have been documented to impact global perspectives and enhance cultural awareness. Very few studies have been done on the impacts of a Peace Corps volunteer’s international experience. Peace Corps volunteers on average spend two years in their country of service. This type of international experience is much longer than the typical experiences reported on in previous studies. Peace Corps volunteers’ experience is typically much more entrenched in the country of service, their host community, and local culture. Some studies have examined the cross-cultural awareness of Peace Corps volunteers (Carano, 2013; Klem, 2007) but none have touched on the global perspective change as a whole of Peace Corps volunteer experiences. Hanvey (1975) discusses five dimensions for an attainable global perspective; perspective consciousness, state of the planet awareness, cross cultural awareness, knowledge of global dynamics, and awareness of human choices. More attention should be placed on the experiences of Peace Corps volunteers and how those experiences impacted their global perspective.

Purpose and Objectives
The purpose of this study was to understand the change in global skills of Peace Corps volunteers after their long-term international experience. Five skill sets were used to assess their global perspective; problem solving related to strategic skills, synergistic learning related to intrapersonal skills, global perspective related to cognitive skills, psychological health related to stress management skills, and communication skills related to interpersonal skills.

Methods
A quantitative survey research design was developed to explore the change in global skills of Peace Corps volunteer’s international experience. An online post-pre questionnaire adapted from the global skills inventory instrument (K. Rosenbusch, personal communication, July 13, 2018) was developed for returned Peace Corps volunteers to indicate their level of agreement with various statements before starting their Peace Corps service and their level of agreement with those same statements after they returned from their service. The questionnaire contains 62 five-point summated scale questions: strongly agree=1, agree=2, neither agree nor disagree=3, disagree=4, strongly disagree=5. Descriptive statistics were used to determine the mean of the responses in each of the five skill sets. Gain scores were calculated to indicate the change within each skill set as a result of Peace Corps service.

Results
Results show the participants indicated the greatest gain ($M_{\text{gain}} = 0.76$) in communication skills. After Peace Corps experience participants indicated higher ($M = 1.6$) communication skills than
before \((M = 2.36)\). The second greatest gain \((M_{\text{gain}} = 0.73)\) was in synergistic learning. After Peace Corps experience participants strongly agreed \((M = 1.23)\) with statements in this skill set while before their experience participants indicated they agreed \((M = 1.95)\) with the same statements. Participants also indicated gain \((M_{\text{gain}} = 0.60)\) in problem solving. Higher \((M = 1.85)\) problem solving skills were indicated after Peace Corps service than before service \((M = 2.45)\). Gain \((M_{\text{gain}} = 0.51)\) was also indicated in global perspectives. Participants strongly agreed \((M = 1.4)\) after Peace Corps service whereas before their service they agreed \((M = 1.91)\). The final skill set measured was psychological health with the smallest gain \((M_{\text{gain}} = 0.33)\). Participants indicated higher \((M = 2.93)\) skills after Peace Corps service than before \((M = 3.27)\).

**Recommendations**

These findings are similar to previous studies on the positive global perspective impacts of international experiences. Peace Corps volunteers experience a much longer and immersive experience that positively impacts their global perspective. Findings support that the Peace Corps increases global skills of its members. Findings showed that Peace Corps volunteers indicated that their service improved their problem solving techniques, enhanced their negotiation strategies, developed their ability to deal with uncertainty, and aided the improvement of their communication skills. Identifying the positive impacts of service may help the Peace Corps better market and recruit potential volunteers. It also documents positive impacts of the program for accountability purposes. Continued efforts to document impacts of Peace Corps service is warranted. Additionally, it is recommended that similar assessments of students participating in other types of global service and for varying lengths of time abroad be conducted to more specifically identify those positive gains that may be directly linked to the Peace Corps.

**References**


Internationalizing Formal and Non-Formal Curriculum in Agricultural and Extension Education to Improve Learner Outcomes

Scott D. Scheer  
Jera E. Niewoechner-Green  
Mary T. Rodriguez, Ph.D.  
The Ohio State University

Introduction
Effective strategies for teaching and learning are important to consider whether in academic courses or through workshops in non-formal educational settings. There has been an emphasis about the benefits and strategies for internationalizing curriculum and teaching. In academic settings, research studies have indicated topics important to include in agricultural college courses such as globalization and its implications on agriculture and understanding agricultural and extension education systems in different countries (Bruening & Shao, 2005). Other studies have focused on internationalizing classrooms (Pitts, Chaippe, & Mengiste, 2010), undergraduate programs (Gouldthorpe, Harder, Stedman, & Roberts, 2012; Navarro & Edwards, 2008) and teaching academic courses in international settings (Radhakrishna, 2006). Studies in non-formal contexts, usually Extension, have also emphasized the positive outcomes of internationalized program content and experience. Recommended competencies for teaching in international extension settings have been established and include competencies of change strategies, learning principles, and organizational development (Strong & Harder, 2011). Other studies have pointed out the need to internationalize Extension through farmer-to-farmer programs (Bates, 2006) and professional development for non-formal educators through an international lens (Harder, Lamm, & Vergot III, 2010). An area to explore further are the methods for internationalizing both formal and non-formal instructional strategies to develop more purposefully integrated cross-disciplinary perspectives in courses and research related to agricultural and natural resources.

Purpose/Objectives
The purpose of this poster presentation is to provide multiple approaches of incorporating international perspectives of agricultural and extension education to use in formal and non-formal education settings. Specific examples will be shared as models for replication and implementation.

Theoretical/Philosophical Themes
A cross-national theoretical framework is used which emphasizes a global perspective to overcome cultural, linguistic, and ethnic barriers to better understand the human condition (Kohn, 1989). Understanding how social institutions are related to national characteristics, allows for deeper analysis of similarities and differences across contexts and the understanding that no nation exits in an international vacuum. Through internationalizing the educational environment, value is placed on comparative analysis of political and economic systems, cultures, and social structures to acknowledge similarities and differences across countries and learn from events leading to the current contexts in which students may work.

Conclusions
The authors of this poster presentation share via action research (authors as participants) the advantages of internationalizing curriculum and resources. Evidence is provided from academic courses (undergraduate and graduate) and in non-formal, extension settings. Benefits were observed across geographic locations using internationalized curriculum. Specific examples are shared in the next section. The authors bring international viewpoints and educational practices in geographic contexts that include Belize, Cameroon, Costa Rica, Ethiopia, Honduras, Jordan, Mexico, Nicaragua, South Africa, Tanzania, Trinidad & Tobago, and the United States.

**Educational Importance**

The educational importance of internationalizing curriculum and teaching practices is clearly evident from the research literature provided in the introduction section. The authors are strong advocates of purposeful and critical integration of international perspectives in formal and non-formal learning contexts. For example, in academic agricultural and extension education courses guest speakers or the authors connect course content across cultures and geographic locations in topic areas from program planning to food security. Lessons learned about addressing food security in developing countries have implications for industrialized nations and vice versa. The authors have been involved with funding through USAID to provide graduate education (course work) for students outside of their home country, while conducting their research in their home country.

Non-formal extension education can be particularly productive with an internationalization emphasis. The authors regularly conduct workshops and trainings using a cross-national theoretical approach which values local traditions and cultures. While at the same time tapping into practices from other contexts that can inform and advance the goals and objectives of non-formal programs. Illustrations include the advancement of women in Honduras, food security promotion in Tanzania, and environmental sustainability within Costa Rica. The authors will include figures, text, and pictures in the poster presentation to give details about these examples. Conference attendees who view this poster will take ready-to-use strategies to improve learner outcomes by internationalizing their curriculum and resources.

**References**


Transforming Lives through Empowering Women: Integrating a Whole-Person Learning Approach within Education and Training Programs in Kenya

Jenny Nuccio  
Texas A&M University & Texas Tech University  
David E. Lawver  
Texas Tech University

Introduction
Empowerment is not a temporary fix or a quick handout, but it encompasses the knowledge of the whole person. It seeks to transform and drastically alter lives through socio-economic factors that establish growth in self-confidence and worth of the individual involved. By growing cognitive skills through education and training, an individual has the capability to contribute to society because they have overcome the isolation of psychological needs. They have transitioned from merely surviving, to thriving in their life. “This ‘whole person’ experience differs from conventional education in its learning objectives and teaching methods, which consider emotional and social, in addition to cognitive, outcomes, and it is an established and well-studied form of experiential pedagogy” (Barbera, Bernhard, Nacht, & McCann, 2015, p. 324).

Underdeveloped nations, like Kenya, are known for high poverty and high unemployment rates. Due to this common factor, we find that there is a saturated amount of training programs dispersed across these various countries, which promote socio-economic benefits for individuals displaced or in need. Although acquisition and training programs are readily available, many lack the development of the whole person. It is more than equipping these women with skills, but it is about providing dignified work that allows for them to develop in their character and leadership development skills due to the development of positive self-perspective. “Integral development therefore covers all aspects of human life. Obviously, it covers the economic matters and therefore development in the economic sense, starting with the fundamental issues of hunger, thirst, and health, and moving beyond to education. (Naudet, 2013).

By integrating whole-person learning approach, these women are transformed and grow into positive leaders for their workspace and community. “Taking part in leadership training and development process provides the means to one’s self-discovery and improvement. The motivation to lead and engage in leadership development is enhanced when a person has strong engagement in positive thought self-leadership” (Skarbaliene & Minelgaitė-Snaebjornsson, 2017, p. 10).

Empowering women through education of the whole person establishes a confident voice within the woman as her esteem and self-actualization needs are being met. By growing both cognitive and emotional skills through the whole-person learning approach, a woman has the capability to contribute to society and become a change agent within her community.

Purpose and Objectives
Education of the whole person is essential for change to take effect amongst developing nations. The purpose of this poster is to demonstrate the importance of empowering vulnerable women through the use of educating the ‘whole person’. This impact emerges from socio-economic
factors and emotional investment of the woman involved in the program. “Emotions have been described as an important catalyst for learning and development” (Barbera, Bernhard, Nacht, & McCann, 2015, p. 336). This poster will focus on the transformation of the whole person through adaptive and innovative educational practices.

**Methods**
This poster will illustrate the intrinsic value of empowering women in Kenya. Additionally, it will focus on the transformation that occurs when education of the whole person is implemented through the use of socio-economic factors in existing training programs.

**Conclusions**
By empowering women in Kenya, it is changing the outcome of the future for these communities. “Africa is a land of untapped potentials in terms of human and material resource endowments” (Oluwatayo & Ojo, 2018, p. 66). By transforming the life of a woman through holistic education, it will enhance the human capital and lead to growth of an individual. Overtime, these empowered women will evoke innovative thinking and change in their society due to the result of growth in their self-perception and innate confidence.

**Educational Importance**
This poster raises awareness of the importance of empowering women education of the whole person in Kenya. It provides a platform for the creation of future programs, which will focus on the implementation of the whole-person learning approach. By educating the whole person through the empowerment of women, it allows for innovative leaders to emerge in the community. These empowered women become leaders through growth in character and self-actualization, ultimately becoming change agents in their country.

**References**
Perception of Pre-Service Teachers Regarding the Importance of Global Awareness in the High School Agriculture Classroom

Susan Jones
Joy Morgan
North Carolina State University

Introduction
The high school agricultural education class is a place where students learn valuable skills related to agricultural concepts that are found within the agricultural industry and hopefully applied to a future career. Although agricultural concepts are the main focus, other important skills are incorporated such as reading, writing, and math because these skills are also prominent within agricultural careers. Just as reading, writing, and math are important integrated concepts that the student needs to understand, so is thinking globally. The agricultural industry is a fast-paced, growing industry that stretches from nation to nation. As the industry advances and expands outside of the United States, students must be globally aware of the agricultural industry and those impacts made by other countries. Global awareness and an understanding of global concepts are important as teachers seek to prepare students who are able to compete in a global economy (Bikson, 1996; Radhakrishna & Dominguez, 1999).

Purpose and Objectives
The purpose of this project was to understand the amount of global knowledge offered to current Agricultural Education majors during their high school career and their current view on the integration of global awareness into agricultural education. Two objectives were identified as focus areas:

1) Do lessons that incorporate global activities allow students to improve global thinking?
2) Are students who were exposed to global thinking more apt to incorporate global learning in their future classes? What influence, if any, did global learning have on them?

Methods
Survey research was used for this study to gain information related to current agricultural education student’s high school experiences related to global concepts. The survey utilized five point Likert scale style questions and open-ended questions that required the participant to provide feedback on their experiences in agricultural classes in high school related to global awareness and global knowledge. Participants were asked to describe global activities they participated in and what effect the global learning, if any, had on them. Questions were constructed based on a review of literature and the initial objectives. The survey was created using the online survey generator, Qualtrics. This survey engine was selected because of its ability to summarize data in a clear manner. The population of this project included currently enrolled North Carolina State University students in Agricultural Education. The survey was distributed through the departmental listserv. In addition, a $25 gift card drawing was used as an incentive for those students who completed the survey. Students were emailed the survey link, and two reminders were sent to non-respondents. Survey responses were kept anonymous and survey responders were asked to notify the researcher via email when they completed the survey.
to be eligible for the gift card. Names were written on paper and randomly drawn to determine the winner of the $25 gift card. A total of 34 respondents participated in the research study.

Results
The results of this project were very insightful on the amount of global knowledge that is currently present in (State) and among agricultural education majors. When looking at the mean of the survey questions that were directly related to global knowledge, these ranged from 1.53-3.78, where 5 would represent global knowledge always being present in the agricultural classroom. This emphasizes the lack of global concepts present with the agricultural education classroom, but does show that there was at least some global knowledge present. The researcher also found that 65% of the respondents had traveled outside the United States. Of the participants, 81% stated an interest in a short-term study abroad, while only 25% would be interested in a long-term study abroad program. These percentages show an interest in global experiences, but only for a short amount of time. Based on the results, students value and see the importance of global competencies which hopefully will carry over into their high school classrooms when they become teachers.

Recommendations
To better prepare high school students to enter the career workforce or college setting, global concepts should be integrated within the agricultural education curriculum when possible. By integrating these concepts, agriculture teachers can encourage travel and study abroad experiences as well as a greater understanding of diverse perspectives. A future study to gain more insight on this topic would be to survey university students from across the United States to understand the similarities and differences among programs in other states. To encourage the implementation of global lessons into high school curriculum, it is recommended to hold a pre-service workshop for teachers to learn strategies use in their classroom.

References


Pupil Voice Groups: Do They Increase Engagement in the Community?

Eric D. Rubenstein  
Jason B. Peake  
University of Georgia

Introduction

Pupil Voice Groups (PVG) are student initiated, lead, implemented, and managed organizations within a school that offer students an opportunity to become active citizens of the school, have a voice, and impact what is happening in the educational setting of their school. The nature of current educational systems places children and minors in a rapidly changing social dynamic which can often leave the students feeling as though they do not have a voice (Lincoln, 1995). There are a variety of motivations for the implementation of PVG’s. The United Nations Convention on the Rights of the Child (UNCRC) promotes that state entities educate a child to “assure to the child who is capable of forming his or her own views the right to express those views freely in all matters affecting the child, the views of the child being given due weight in accordance with the age and maturity of the child” (p 5). (Article 12, 1990).

Purpose

Schools utilize PVG’s to provide students with the means (voice) to both formally and informally play a critical role in the healthy development of their environment and their self. However, several questions are raised in regards to the effectiveness of these programs:

- Are these students provided a voice to influence interpersonal, institutional organization, community, and policy?
- Do PVG’s foster children who are capable of forming his or her own views?

Therefore, the purpose of this study was to describe the role that PVG’s play in engaging students in the community.

Methods

Troqueer Primary School located in Dumfries, Scotland served as the school where students were sampled and the data collection were conducted. The study utilized focus-groups for data collection where 6 to 9 students from each grade level were interviewed by researchers in a focus-group and 1 community members \((n = 36)\). Draper (2004) and Fade (2004) both provide philosophical and theoretical bases for the use of focus-groups in researching human behaviors, feelings, and attitudes. Researchers served as both moderator for the small group discussions and recorder for student comments. Students were presented with a series of questions leading to the overall essential question of “How do Pupil Voice Groups engage students in academic programs?”. The audio files were transcribed and each student was given a pseudonym to ensure the anonymity of the participants. Once the files were transcribed, the documents were coded utilizing the constant comparative method described by Lincoln and Guba (1985). Trustworthiness and Rigor were upheld through the use of triangulation, member checking, saturation, and methodological journals.
Findings

Through this research, 3 themes emerged from the data:

1. Meet More than Once a Month
2. Strengthened Community Involvement
3. The World is Bigger than I

While, meeting times were limited to once a month to ensure that adequate instructional time was provided, the participants believed more time should be spent on PVG’s. Each of the students except for two stated being involved in the PVG’s made them want to come to school. S-10 stated “being in a PVG makes me feel like I am an important part of the school and community. I wake up each hoping that we will get to meet.” Further, students shared that they believed that they were not able to get enough accomplished during the monthly meeting. S-22 shared, “each month I feel rushed during our meeting, like, we just run in circles and finish nothing.”

Many of the students, discussed that their involvement in the PVG’s increased their knowledge of the community’s needs. Further, the students shared that they believed they needed to have a stronger presence in the community. S-17 reported, “Being in Roto-kids makes me aware people in our community need our help. I just want to find a way to help them.”

The final theme that emerged from the study, was the idea that the world is bigger than the students themselves. The school is partnered with a school in Kenya and works to ensure the school has the supplies needed to provide their students a full education. S-32 stated, “I am so glad that I get to share my school supplies with students at our partner school. I feel like I am making a difference in their lives and that makes me feel good.”

Recommendations

The researchers recommend examining how PVG’s can be utilized to help implement agricultural education programs in elementary schools in the United States. Further, secondary and elementary teachers in the United States should works to encourage this same type of engagement by students in their local communities.

References


An Investigation of Crisis Communication Amidst Natural Disasters: Opportunities for Extension Systems

Megan Myers
Robert Strong Jr.
Texas A&M University

Introduction
Communities are extremely vulnerable when local and national systems cannot cope with the aftershocks of a crisis (WHO, n.d.). The international community has made substantial effort to reduce the impact disasters have on people and livelihoods with natural and technological triggers (O’Brien, O’Keefe, Rose, & Wisner, 2006). According to the American Red Cross (n.d.), they respond to an emergency every 8 minutes and approximately 64,000 disaster responses each year. The World Health Organization (WHO) partners with Member States, international partners, and national partners to help communities prepare for disasters, deal with health consequences, and mitigate the long-term effects (n.d.). The University of West Indies developed the Disaster Risk Reduction Centre (DRRC) after the hurricane in 2004 (UWI, n.d.). Initiatives include managing and sharing Comprehensive Disaster Management (CDM) knowledge, management policy for the Jamaica Red Cross, and reports on livelihood baseline assessments (UWI, n.d.).

Extension organizations in the Organization of Eastern Caribbean States (OECS) must be strengthened to disseminate information to farmers primarily through radio PSAs (Ganpat, Barry, & Harder, 2018). Ganpat, Narine, and Harder (2017) reported Information Communication Technology (ICT) development and dissemination has been supported by Caribbean governments. While the ICT revolution was created in the industrialized world, the most dramatic impacts are illustrated in developing countries by enabling the expansion of vast communication networks without traditional cable infrastructures (Toya & Skidmore, 2018).

Purpose and Objectives
The purpose of this study was to provide an overview of how crisis communication has been an asset during natural disasters.

Methods
This case study was selected to provide an investigation of disaster communication between developed and developing nations. Data for case studies can be qualitative or quantitative evidence, and can be collected from fieldwork, archival records, verbal reports, observations, or a combination of designs (Yin, 1981). The distinguishing characteristic of a case study is that it examines a real-life example, especially when the boundaries between the phenomenon and context of the situation are not clearly correlated (Yin, 1981).

Results and Conclusions
In July 2018, Ministers of Foreign Affairs from the EU and from the Community of Latin American and Caribbean States (CELAC) met to settle upon a 30 million euro financing agreement for post-hurricane and reconstruction efforts (European Commission, 2018).
A million euro will be allocated to Dominica to support the budget for a national recovery plan (European Commission, 2018). 5 million euro will be directed towards Antigua and Barbuda for housing reconstruction for low-income families (European Commission, 2018). And 14 million euro will support the Caribbean Disaster Management Agency (CDEMA) to strengthen the region’s disaster preparedness and response capacity (European Commission, 2018). These three programs are a subset of a 74 million euro package adopted this week to “build-back-better” and promote resiliency in the Caribbean region (European Commission, 2018).

In order to prepare for potential tsunami threats in the Caribbean, the Pacific Tsunami Warning Center (PTWC) issues regional messages to Tsunami Warning Focal Points in each country (CDEMA, UWI & USAID, 2010). Tsunami information bulletins are used to advise of major earthquakes, provide general information about tsunamis, and typically indicates that there is no threat of a destructive tsunami at the time (CDEMA et al., 2010). A tsunami advisory is issued when there is a threat of a tsunami threatens those close to the water due to strong currents or waves (CDEMA et al., 2010). A tsunami watch is the second highest level of alert, it is issued to provide an advance alert to areas that could be impacted by damaging tsunami waves (CDEMA et al., 2018). A tsunami warning is the highest level of alert and is issued when there is imminent threat due to a large underwater earthquake, or following confirmation of a destructive tsunami headed towards the particular region (CDEMA et al., 2010).

Recommendations and Educational Importance

This case illustrated the cause and effect of how crisis communication has strengthened avenues of disaster relief between government agencies, nonprofits, and people. Crisis communication must be a top priority for developed and developing nations to protect the wellbeing of the people. As a country transitions through phases of development, it reduces the vulnerability to natural disasters by allocating greater resources to safety (Toya & Skidmore, 2018), ICTs have played an essential role in enhancing communication in the Caribbean. Most disasters are unpreventable, but their effects can be mitigated (O’Brien et al, 2006). In order for countries to prosper amidst natural disasters, government agencies and non-profits must partner together and utilize Extension resources to alleviate damage in affected communities.

References


The University of the West Indies. (n.d.). *About the Disaster Risk Reduction Center*. Retrieved from http://www.uwi.edu/drrc/about


Faculty Attitudes and Motivations for Study Abroad Service Learning Programs

Caroline Cully Garbers  
T. Grady Roberts  
University of Florida

Introduction

International components of curricula have grown in popularity and importance in colleges of agriculture (Graham, 2012). Globalization affects current and future agricultural students in their personal and professional lives (Chang, Pratt, Bielecki, Balinas, McGucken, Rutherford, & Wingenbach, 2013). It is becoming increasingly important for students to have an international experience as part of their undergraduate careers. According to Zhai and Scheer (2004) agricultural college students who had international education experiences believed studying abroad was a useful experience in promoting personal development and global competencies. Furthermore, service learning has become a teaching practice used to decrease emphasis on individualism, increase civic responsibility, and feelings of inclusion within a community of students (Harder, Bruening, Graham, & Drueckhammer, 2009).

The Transformative Learning Theory has a significant place in the main aspects of study abroad. Mezirow (1997) defined transformative learning as the process of affecting change in a frame of reference. Learners participating in transformative learning move toward a frame of reference that is more inclusive, discriminating, self-reflective, and integrative of experience (Mezirow, 1997). A person’s frame of reference is often transformed through critical reflection on the assumptions upon which their interpretations, beliefs, and habits of mind or points of view are based (Mezirow, 1997). If educators can facilitate a change to the frame of reference for a student, the student is experiencing transformative learning. Service learning and study abroad programs have been viewed as potential transformative learning experiences.

Purpose

The purpose of this study was to explore the attitudes and motives of faculty who lead study abroad programs that have a service learning component in the program.

Methods

The population for this study was agricultural faculty at land grant universities who lead study abroad programs which include a service learning component. Potential participants were identified through a related study through points of contact at each university that included deans, associate deans, and study abroad directors. In total, seven faculty were nominated and five agreed to be interviewed, representing five universities. Faculty were asked to participate in a thirty-minute semi-structured interview which took place via the phone or face to face. Data were analyzed using an open coding process and then axial coding was used to organize codes into themes and sub-themes (Saldaña, 2013).

Results

Culture
The overarching desire for faculty to create these programs was to have students experience a cultural outside their own. Faculty wanted students to go beyond what was considered their everyday norms and get out of their comfort zone.

**Service Learning Programs**
Respondents designed these programs with service learning in mind as a way for students to interact more with the local population. The idea was that students would not only impact the local community in a positive way but that students would also be challenged to change their own preconceived notions in terms of volunteer work in another country.

**Expectations.** A subtheme of service learning programs found respondents indicating that there was a deficiency between preprogram expectations and the realities of the program. However, they felt that this issue was part of the learning process for the students.

**Selection.** Another subtheme was student selection of the programs. There were various ways in which faculty selected students to participate in these programs. For most, the functioned in a first come first service manner in which if students signed up for the program, they were automatically admitted. Other programs were more selective and required interviews before students were approved.

**Conclusions and Recommendations**
Faculty motivations for leading study abroad programs with service learning centered on a desire to provide a cultural experience for their students. They believed these programs were a great way to provide authentic interaction with local populations, which was consistent with Harder et al. (2009). Faculty also reported student preprogram expectations did not always match the realities in the field. Additionally, faculty used a variety of processes to select students to participate.

Future programs should work to establish clearer expectations to maximize student learning (Mezirow, 1997). Recommendations for future research include exploring students’ perceptions of expectations. Additionally, research could also be conducted with faculty outside of the agricultural fields. Multiple disciplines could lend to a more robust understanding of faculty attitudes and motives.

**References**


Introduction and Review of Literature

Assessing the needs of the clients is an important step in extension program planning (Caffarella, 2002; Etling & Maloney, 1995; Reddy, 1993). Extension educators conduct needs assessments on a regular basis (Malmshheimer & Germain, 2002) and use the results to design their programs (Donaldson & Franck, 2016). Such assessments help in identifying areas that will benefit most clients over a period of time (Donaldson & Franck). Since needs change over the time, educators should not assume that they have a good understanding of their clients’ needs (Etling & Maloney), and conduct needs assessment periodically.

This paper presents the results from a needs assessment study of growers conducted by a County Extension Office in the Western United States. Although agriculture is the fifth major industry in this county, it includes 243,029 acres devoted to commercial agriculture and had a direct economic output of about $1.7 billion in 2017 (Department of Agriculture Weights and Measures, County of [     ], 2017). This study is significant as the last formal, comprehensive growers’ needs assessment was conducted by county extension two decades back. This study was conducted to develop a profile of growers in the county, to document the growers’ production practices and to identify issues of concern and farming related needs. The results will be used to inform future extension program design and delivery.

Methods

A descriptive cross-sectional census survey was administered on Qualtrics to commercial (for profit) farm business operators in the county. The sampling frame was developed from the client mailing lists developed by the county from their past training participant logs and from other partners. It was not possible to get the number of survey recipients as some of the partners that administered the survey couldn’t share their recipient lists according to their organizations’ privacy policies. An initial invitation email followed by four reminders to non-respondents were administered. 296 growers responded to the survey. The survey was developed by County Extension Personnel in consultation with a Grower Advisory Board, other County Staff and an Evaluation Specialist. These stakeholders established the face and content validity of the survey while a pilot test with seven members of the Advisory Group established the reliability.

Results

A great majority of the respondents were white (70%), over 50 years of age (79%), male (70%) and with 4-year college or higher degrees (~66%), with an average farming experience of 19.5 years. About 47% of the respondents were individual owners or sole proprietors, and a great majority (78%) were full owners. A great majority (76%) of the respondents used smartphones and computers in their farming operation. Further, they used a wide variety of Apps or programs on those devices.
A great majority (74%) of the respondents expressed a desire to expand their production to access profitable market outlets. The respondents were most concerned about costs of farming (63%), laws and regulations (46%) and labor supply issues (44%). Most respondents accessed information about farming mostly through websites; e-newsletters and e-mail; in-person meetings, workshops and conferences, and personal networking. Most of the respondents indicated that mornings (64%) on Wednesdays (27%) and Tuesdays (25%) would work best for them to attend the county educational meetings. Two-third (69%) of the respondents were satisfied with the responses received from UCCE San Diego county office at any time.

The preliminary associational analyses indicated that having more farming experience was correlated at a statistically significant level with a higher preference for conventional farming compared to organic; higher interest in aggregating products with others; a distrust of commercial food supply/system; lower concern about laws, regulations, labor supply issues and trade and foreign competition. Further, bigger farm size was correlated at a statistically significant level with lower concern for labor costs, labor supply issues, pest problems, marketing alternatives, marketing commissions, and trade and foreign competition.

**Educational Importance and Implications**

We are working to prioritize the needs from wants, concerns and preferences related to farming practices, marketing channels, laws and regulations, extension program delivery, and technology and information usage patterns. The correlation results are being used to develop grower profiles that will inform targeted educational programming. Regression analyses will be computed to test for causal effects. We anticipate that designing future programs on the basis of the needs identified from this study will have a positive impact on the growers and help sustain agriculture in the county. The findings have been shared at state Extension meetings, which is expected to strengthen the needs assessment efforts of extension personnel and nonformal educators.

**References**


Experiential Learning Experiences and Leadership Development of Students on a Study Abroad Trip to Australia

Baylee Jarrell
Carrie Stephens
The University of Tennessee, Knoxville

Introduction
Experiential learning holds the potential to impact what a student takes away from a study abroad experience. Learning should not be measured as a development, but more importantly learning is persistent through involvement and learning is the progression of creating one’s own knowledge (Kolb, 1984). Overall, experiential learning through study abroad experiences ultimately strives for social transformation of one’s learning.

Purpose and Objectives
The overall purpose of this study was to describe student’s perceptions of being engaged in an experiential learning study abroad trip to Australia.

Methods
Students were engaged in experiential learning activities some activities conducted were in effort to increase students’ international perspectives in the areas of leadership, education, communications, and extension. In an effort to remain true to the experiential learning process, students selected organizations from a generated list in which students learned about leadership, education, communications or extension. Six students, 1 male and 5 females, were involved in a study abroad trip to Australia for 21 days. Throughout the 21 days, interviews were conducted with the students about their experiences. These interviews lasted anywhere between 15 minutes to 45 minutes. A thematic analysis was chosen to help code and transcribe those interviews due to the flexibility, detailed, and complex description of data that thematic analysis provides for qualitative research. Thematic analysis was used in order to code the transcriptions from each interview and to pinpoint four themes that evolved from this study.

Results
There were nine codes (cultural diversity, perceptions of experience, personal growth, study abroad challenges, experiential learning, leadership, global learning, emotional impact of study abroad, and team-based experiences) that evolved from this study and were then converted into five themes. Those five themes, with supporting documentation, are listed below.

1. Experiential learning did occur with these students.
   Well I didn't really come in with a big agricultural background so not knowing what to expect. I learned that people and everything is based on agriculture whether it be tourism or whether it be the culture or whether it be just something like simply going out to eat like everything over in Australia involves agriculture in some way so I think I was pretty narrow-minded when it came to agriculture I thought it was just crops and farming and I think that my overall learning outcome is that it's way more than that.
2. Personal growth was evident while utilizing experiential learning methods and team-based experiences. “I learned a lot. I learned a lot about cultural diversity. I learned a lot about myself and who I am and where I stand with a lot of different things.”

3. Cultural and Global diversity impacted the student’s experiences and invested in their overall learning. “It was really diverse, I think it was one of the most culturally diverse places that we've been to, so you had a lot of different things going on.”

4. Student’s perceptions of agriculture were enhanced by witnessing Australian Production sites. “Eye opening for me just seeing how farmers impact the communities in a positive way because if you take out the farmers you don't have the communities…if you take the farmers out then your community won't survive so I guess that was really eye-opening to me that the number of farmers and tradespeople they have here in Australia.

5. Student’s emotional challenges were evident, but they persevered outside of their comfort zone. “I was kind of nervous at first coming to a new country for three weeks and I was kind of nervous that we had three weeks to do all these sites and everything we had to go to and do was a lot on our plates, but I’m really glad I did it because I learned so much about myself and leadership.

Conclusions/Recommendations/Implications
The overarching conclusion is during the study abroad experiential learning experience in Australia, students developed their leadership skills, grew personally, and enhanced their cultural diversity. The authors recommend to others who would like to lead an experiential learning study abroad trip to allow students to explore their learning questions and to be adequately engaged in the experiential learning process. Also, truly immersing students in the experiential learning process can be challenging for students and the faculty mentor must provide support and direction during challenging situations. The implications of this study are students should buy-in to the experiential learning process to be fully engaged in the experience. Furthermore, faculty should provide opportunities for student growth through exploring the culture in which they are immersed.

References
Oral Presentation Abstracts
Resource Presentation Preferences of Extension Professionals in Their Use of Facebook

Moses Mike
Amy Harder
University of Florida

Introduction
Extension professionals experience high demands on their time (Ensle, 2005; Hu, Yang & Kelly, 2009, Moore & Harder, 2015). Finding availability for training and capacity development can be a challenge. Yet, having competent extensionists is critical for the provision of high-quality extension services (Swanson & Rajalahti, 2010).

Providing extension professionals with access to resources through Facebook may be a practical alternative to providing on-demand professional development. Papacharissi and Mendelson (2011) identified professional advancement as one of nine possible motivations for using Facebook. The Program Development and Evaluation Center (PDEC) for UF/IFAS Extension has hosted a Facebook page since 2015. As of September 2018, there were 317 people who liked the page and 314 people following it. Most of those people live in the United States. Daily content focuses on core competencies (Harder, 2015), often in the areas of leadership, time management, and program development and evaluation. In 2018, PDEC began testing videos as a new format for content delivery to see if they would increase users’ interaction with professional development content delivered through the Facebook page.

Purpose and Objectives
The purpose of this study was to ascertain the resource presentation preferences of extension professionals in their use of Facebook. The primary objective of this research was to determine if video resources were more popular than text-based resources on PDEC’s Facebook page using the Facebook analytics of Reach, Clicks, and Reactions.

Methods and Data Sources
A descriptive approach was used for this study. Measures were comprised of metrics from Facebook analytics, namely Reach (accounts with the resource on their feed), Clicks (accounts that clicked on the resource) and Reactions (a digital emotional response mechanism). According to Carr, Hayes, and Sumner (2017), the chosen metrics are good indicators of impact. The posts were grouped as either video resources ($n = 14$) or other resources ($n = 79$). Video resources mainly consisted of originally produced PDEC videos, but other video content like webinars and YouTube content related to Extension was also included. The presence of extreme outliers for the video resources could not be fully remedied by truncation, log data transformation or other data transformation techniques, hence the absence of other analytical techniques. Text resources generally included websites such as ufl.edu, JOE.org, INC.com, HBR.org, Extension.org, and Energizeinc.com. Posts ($N = 93$) to the PDEC Facebook page between April 4, 2018 and September 17, 2018 formed the data set. Descriptive statistics used in this analysis were generated by SPSS software.

Results and Conclusions
The average Reach for all posts was 97 (SD = 192.40). Video resources had an average Reach of 270.86 (SD = 468.43), while text resources had an average Reach of 67.06 (SD = 27.55). The average Clicks for all posts was 7.76 (SD = 25.85). Video resources had average Clicks of 30.21 (SD = 62.93), while text resources had average Clicks of 3.87 (SD = 4.45). The average Reactions for all posts was 4.16 (SD = 14.39). Video resources had average Reactions of 18.50 (SD = 34.54), while text resources had averages Reactions of 1.62 (SD = 1.40). The most popular video resource post reached 1,721 users, while the most popular text resource reached 186 users. By every metric, video resources performed better than text resources. One can conclude that video resources posted to the PDEC Facebook page are substantially preferred by users over the text resources.

Implications and Recommendations

This comparative study has the potential to inform training and development offerings to extension professionals by guiding facilitators to a reusable medium that has a larger impact than text-based products. This can lead to more efficient training in a shorter time, with extension clients having current information from better trained agents. Although the Facebook page for this study is hosted by UF/IFAS Extension, it has followers from 20 countries which indicates interest and applicability beyond the United States. For organizations wanting to use social media platforms in a similar manner, prioritizing original video content above other training products is recommended. Additionally, related video products from other providers should also be high on the priority list.

Further research should be conducted to manage the extreme outliers in the data and analyze more even sample sizes. Additionally, when the data allows, further research should consider statistical analyses of current and added variables, like thematic categories, for more substantive results. Finally, comparing the popularity of video and text resources on other social media platforms would provide further depth for understanding and catering to extension professionals’ preferences.

References


22(3), 7-19. doi: 10.5191/jiae.e.2015.22301


Gatekeepers of Food and Nutritional Security Projects in South Africa

Sarahi Morales
National Cooperative Business Association (NCBA) CLUSA International

M. Todd Brashears
Amy E. Boren-Alpízar
Courtney Meyers
Wilna Oldewage-Theron
Texas Tech University

Introduction
Community involvement in developmental efforts can contribute to poverty reduction and improve food security. In addition, it can empower beneficiaries and motivate them to take a proactive role in the decision-making processes of their own communities (Mansuri & Rao, 2012). However, community involvement is not an individual decision. It is a collective action taken by the group to which individuals belong (Mansuri & Rao, 2012). In South Africa, traditional leaders, commonly known as chiefs, function locally and work on local community matters (Republic of South Africa, 1996). They oversee the community’s development and safeguard the African culture (Van Kessel & Oomen, 1997). Community members living under a chiefdom structure are expected to respect and follow their traditional leaders. Development workers attempting to engage the community in development efforts are often stymied in their attempts to implement interventions if they do not understand the sociocultural complexities of chiefdoms.

This study was based on the conceptual framework of malnutrition (UNICEF, 1990). The observance of traditional leadership is part of the deep-rooted cultural heritage practiced in rural South Africa (Van Kessel & Oomen, 1997). Successful interventions require the involvement of the community (Mansuri & Rao, 2012), but in South Africa, that involvement requires understanding the people’s traditions. In a previous study, the chief’s involvement in a community health project facilitated community engagement (Campbell, 2010). However, there is limited evidence of the traditional leaders’ role in promoting food security within their communities.

Purpose and Objectives
The purpose of this research study was to investigate the role of traditional leaders in the implementation of food security projects in South Africa.

Methodology
This was a qualitative study using a transcendental phenomenological approach. Seven participants who are extension agents, researchers and community members were purposively selected. The essence of the phenomenon came from their shared lived experiences. In-depth interviews were conducted with each of the participants in English. Data analysis was conducted using the modified procedures of the Van Kaam method (Moustakas, 1994). An epoche process was followed to examine the phenomenon from a fresh perspective using a reflective journal (Crewell, 2012). Themes found were used to develop the textural and structural descriptions that depict the phenomenon (Creswell, 2013).
Data triangulation was used to establish trustworthiness by using multiple sources of data: participants’ interview transcripts, researcher observations and field notes, and photographic images. Thick and rich descriptions were also used (Creswell, 2013; Erlandson, Harris, Skipper, & Allen, 1993; Lincoln & Guba, 1985).

**Results and Conclusions**

Four main themes with a series of sub-themes were found in this study: chief (chiefdom), community reality, chief approval, and chief support. Each main theme follows a sequential order in which the participants described the experience and process to gain the favor of the chiefs in rural communities of South Africa. Chiefs were defined as traditional leaders overseeing the community in developmental, social, and political aspects. The participants emphasized the importance of establishing the context in which the phenomenon takes place (poverty, hunger, vulnerability and lack of resources) as well as the reasoning for a developmental program. Understanding the chiefdom and community context provides the basis for a chief’s approval. The chief’s support comes after gaining his approval. Once approval from is obtained, he provides his complete support to implement the intervention with extension agents and researchers. One participant concluded: “Once you have the will of chief, you have the will of the community, then to implement a community project is not a big deal.”

**Recommendations - Implications**

The themes uncovered the underlying factors that contribute to successful interventions in communities while considering traditions and involving the community and its leader. These findings coalesce with previous authors: when traditional leaders agree to collaborate with external actors, the involvement of the community is more successful (Mansuri & Rao, 2012). Achieving success in an intervention or program requires an involved chief who cares for the welfare of their community and supports the program or intervention. Uninvolved chiefs whose priorities do not align with the community’s welfare can be detrimental for the community.

As chiefdoms are traditions that will most likely remain over time, it is recommended to explore the characteristics of involved and uninvolved chiefs, what are their priorities, and how they exert their power over the community to influence the community attitudes, values, and behaviors. Finally, it is recommended to quantitatively assess food security outcomes obtained by interventions that categorize the chief’s involvement as key in reaching success.

**References**


from the Developmental Leadership Program website:
http://www.dlprog.org/publications/indigenous-institutions-traditional-leaders-and-
developmental-coalitions-the-case-of-greater-durban-south-africa.php

essence of the lived experiences of urban agricultural education students. Journal of
Agricultural Education. 56(1), 58-72. doi: 10.5032/jae.2015.01058

Campbell, C. (2010) Political will, traditional leaders and the fight against HIV/AIDS: A South
African case study. AIDS Care, 22 (S2), 1637-1643. doi: 10.1080/09540121.2010.516343

Chitiga-Mabugu, M., Nhemachena, C., Karuaihe, S., Motala, S., Tsoanamatsie, N., & Mashile,
L. (2013). Civil society organizations’ participation in food security activities in South
Africa: food security study report. Retrieved from the human sciences research council


Department of Agriculture, Forestry and Fisheries. (2014). The national policy on food and
nutrition security for the republic of South Africa (Government Gazette No. 37915, 22
august 2014). Retrieved from the South African health news service website:
https://www.health-e.org.za/wp-content/uploads/2015/03/Policy-on-Food-and-Nutrition-

Dube, M. (2013). Food security in South Africa: A comprehensive review of the past two
decades (Master’s thesis, University Gent). Retrieved from

soy dishes in low-income rural Qwa-Qwa communities. International Journal of Home
Economics, 5(2), 151-166. Retrieved from


Food and Agriculture Organization of the United Nations [FAO], International Fund for
Agricultural Development [IFAD], & World Food Programme [WFP] (2015). The state
of food insecurity in the world: Meeting the 2015 international hunger targets: taking
stock of uneven progress [Adobe Digitals Edition version]. Retrieved from
http://www.fao.org/3/a-i4646e.pdf

Gross, R., Schoeneberger, H., Pfeifer H., & Preuss, H., (2000). The four dimensions of food and
nutrition security: Definitions and concepts. Retrieved from the Food and Agriculture
Organization of the United Nations [FAO] website:

Johnson, L. R. (2016). Community-based qualitative research: approaches for education and the

International Policy Centre for Inclusive Growth United Nations Development
Programme. Retrieve from the International Policy Centre for Inclusive Growth website:


Introduction
Agricultural production environments often contain a large number of hazards that are tackled by an array of engineering design and health, safety, and environment (HSE) policies (Geller, 2001). Compliance with federal safety and corporate HSE policies promote safety at the workplace. Most organizations, however, typically follow policy and procedure which is not enough to achieve safety excellence (Geller, 2001). Agriculture ranks top among hazardous industries in the United States with 621 work-related deaths occurring in 2010 (Bennett, 2013) and 401 work-related deaths occurring in 2015 (Agricultural Safety, 2017). Behavior-based safety (BBS) is a program designed to prevent and reduce injury in organizations by roughly 55% within the first five years of implementation (Krause, 1997). The program is an integrated management process that centrally focuses on people (Jones, Cox & Rycraft, 2004; Hurst & Palys, 2003). BBS categorizes behavior as either ‘safe’ or ‘at-risk’. At-risk behavior is that which could contribute to an injury or death, while safe behavior is that which will not result in any injury or death in the workplace. The conceptual model known as the ‘safety triad’ was adapted from social-cognitive theory by Bandura (1986). The model acknowledges the interrelationship between the individual, the environment, and behavior (Grusec, 1992) and focuses specifically on the effects of safety on the person, behavior, and environment within organizational settings (Geller, Lehman, & Kalsher, 1989). The safety triad was applied to better understand the effects of reciprocal triadic determinism through participants’ daily BBS interactions. The three entities of the safety triad interact to strengthen the safety culture in the workplace (Wood & Bandura, 1989).

Purpose and Research Objectives
Using the safety triad by Geller et al. (1989), the researcher sought to understand the development of safety culture and effectiveness of a behavior-based safety program in reducing safety-related incidents at a cottonseed delinting plant. The research explored 1) the impact of the BBS program on employees’ cultural safety development and 2) the impact of the BBS program on employee's safety communication in the workplace.

Methods and Procedures
The researcher applied focused ethnography design to gain insight into the social, work lives of participants of the BBS program. Ethnography provides rich, holistic insights into people’s views and actions, as well as nature (Reeves, Kuper, & Hodges, 2008). It allows one to study theory in a real-world application using data collection methods from both ethnography and case study
designs despite time and space constraint (Fusch, Fusch, & Ness, 2017). The researcher used an opportunity sample of eight participants out of twenty-five employees. Participants were employees from various levels within the plant: management, supervisors, and frontline workers. The opportunity sample was appropriate given that Bayer Crop Science, who provided the BBS program, aimed to select and train eight participants at the study site (Creswell & Poth, 2017). Data were collected using semi-structured, one-on-one interviews and participants’ responses recorded on scorecards and lasted for three months. Each interview session was recorded to enable transcription. MaxQDA software organized and analyzed data into codes and themes according to Glaser (1965). Use of multiple data collection methods and member checks enabled credibility and dependability of the research process (Carlson, 2010; Creswell, 2014).

**Results**
Findings revealed that development of trust and care on participants’ social relationships occurred after participation in the BBS program. Trust and care were thus essential in strengthening social relationships and workplace safety culture. For instance, one participant mentioned that trust and care impacted the team’s social relationships since the beginning of the BBS program. Other participants attributed BBS to a willingness to care and be concerned with other team members’ well-being, positive reinforcement for team’s social relationships in the workplace, instilling positivity in the work environment, and contributing increased communication since beginning the BBS program. Findings revealed that participants were more inclined to report safety-related incidents in their workplace after the BBS program. It further increased participants’ reporting of “near-miss safety” related incidents in the workplace. “Near-miss” reporting is essential for developing a safety culture while giving information about workplace safety performance

**Conclusion and Recommendations**
The study concluded that BBS provided support for the team’s daily behavior observations, trust, caring relationships, and ultimately, promoted safety culture and performance to reduce safety-related incidents. The researcher, therefore, urged organizations to support interpersonal communication and trust within groups as this is vital to an organization’s success when implementing and attempting to sustain a BBS programs.

**References**


The Use of Selected Social Media by a Group of Small Farmers in Trinidad

David Dolly
University of the West Indies
Anita Zavodska
Barry University
Tracy James
Mathew Edwin
University of the West Indies

Introduction, Theoretical Framework and Review of Literature
According to a recent national (USA) study sample of 2,002 adults by the PEW Research Centre, the social media landscape in early 2018 is defined by a mix of long-standing trends and newly emerging narratives. The results indicated that while Facebook and YouTube were the most popular platforms being used, the younger age group (18-24 years) used Instagram and Snapchat much more (Smith & Anderson, 2018).

Social media and internet adoption have changed people’s approaches to information seeking and delivery (Henroid, Ellis & Huss, 2003). Farmers can not only gather useful information through social media but can also disseminate information about their agricultural products. Social media is (therefore) an effective tool for extension services and mass/distance education (Chang & Lindner, 2017).

When it comes to Trinidad’s small farmers, one hardly knows the extent of use of social media more so for the sharing and use of agricultural information. In nearby South Florida, the University of Florida’s Institute of Food and Agriculture Sciences has emphasized the use of social media to enhance competitiveness of their businesses (South Florida, 2018). It reiterates the use of social media for quick customer service replies, for engaging conversation with customers, for increasing sales, for building trust and transparency, and for general promotion (ibid 2018).

The small farmers in Trinidad are typical of those in developing countries and they mitigate risk in their own unique way. They operate on small pieces of land invariably less than two hectares. Their farming income may come from trying more than one agricultural enterprise. There is a lack of scaled production throughout the land although this is slowly changing. This was a similar finding of Albert, Roberts & Harder (2017) who had studied small farmers in Northern Haiti. In this modern environment of social media, it is therefore important to study its use among the small farmers of Trinidad.

Theoretically one can speculate that these farmers are using social media for non-agricultural information rather than for agricultural information.

Purpose and Objectives
This is a preliminary study that can be followed up with a more rigorous study throughout the Caribbean. Its purpose is to investigate the use of social media technology by small farmers in Trinidad for the purpose of sourcing agricultural and non-agricultural information. The study
assesses farmers’ choice for agricultural information and inquires whether they are familiar with various social media options which can assist them in carrying out their agricultural livelihoods.

Methods and Data Sources
A survey of a purposive sample of one hundred small farmers from selected farming areas in Trinidad was carried out. The survey questionnaire was divided into two sections. The first section inquired of demographics in ten questions. The second section consisted of five questions which inquired of the farmers’ access to agricultural information (for production, marketing and other mentioned reasons) as well as non-agricultural information.

Results, Products, and/or Conclusions
Using SPSS Version 22, it was found that most of the farmers were from male-headed households (68%) with the majority (94%) having some form of formal education. The majority of farms were organized in some form of family structure and most (68%) relied on the farm as the sole source of income.

More than half the farmers (53%) were self-taught in the use of social media. Twenty nine percent had no training and 17% were taught by family members. Just 1% attended a course. Overall, 63% of the farms used the internet as a source for agricultural information during the last five years. This has surpassed the more traditional sources such as family members (58%), advisory officers from input supply shops (40%), state extension officers (32%) and non-state extension officers (31%).

The farmers generally used social media as a source for non-agricultural information rather than for agricultural information. WhatsApp, Websites, YouTube and Facebook were most popular. Snapchat, Instagram, Twitter, Skype and LinkedIn were not popular. There was no use of drones.

The Extension environment can better understand the usage of social media from this study and can embark on the relevant training and other strategies for farmers in order to enhance its use among agricultural livelihoods.

Recommendations, Educational Importance, Implications and/or Application
The authors of the study recommend a bigger study throughout the Caribbean and helping the farmers become more aware of the benefits of social media for agriculture. In today’s world, small farmers should take maximum advantage of the use of social media for their education and improved agricultural livelihoods.

References

Re-examining the Role of Agricultural Communication for Improving Agricultural Productivity among Malawian Farmers

Fally Masambuka
Mary T. Rodriguez
Emily Buck
The Ohio State University

Introduction
Since its inception, agricultural communication (AGCOM) has been known to aid in disseminating research based agricultural information to farmers (Cash, 2001). This has led to the use of AGCOM as just a tool as opposed to a science for understanding people’s behavior (Tucker, 1996). As such, for most of the developing countries like Malawi, AGCOM is used as a promotional and awareness creation tool for sharing information on agricultural programs and technologies among rural farmers in order to facilitate adoption of improved technologies for increased productivity in small farms (Tucker, Whaley, & Cano, 2003; Masambuka-Kanchewa 2013; Masangano, Kambewa, Bosscher & Fatch, 2017; Ragasa, Aberman, & Mingote 2017).

For Malawi, this dates back to 1958, when the Malawi Government, via the Ministry of Agriculture, established Agricultural Communications Branch (ACB) in an attempt to increase access to and adoption of scientifically tested and proven technologies among farmers (Manda & Chapota, 2015). Apart from efforts of the ACB, in 2000 the Malawi Government started implementing an agricultural extension policy that promoted pluralistic demand-driven extension, which led to increased availability of non-governmental organizations providing agricultural communication services to farmers (Masangano, Kambewa, Bosscher & Fatch, 2017). However, after several decades of using different communication tools to promote these technologies, low productivity among most small holder farms remains a challenge (Lunduka, Fisher & Snapp, 2012; Ragasa, et al., 2017).

Limited impact of AGCOM in promoting adoption of improved technologies among small holder farmers raises a question as to whether using AGCOM as an awareness or technology promotion tool alone is effective. Therefore, this study aimed at exploring the drivers of AGCOM and the impact of AGCOM on farmers participation in agriculture. The following question was addressed during the study: What factors influence development and dissemination of agricultural information in Malawi by various AGCOM organizations?

Methods
In this exploratory, convergent, mixed-method research design, surveys were administered to 66 AGCOM officers alongside interviews with 30 farmers comprising of fifteen men and women respectively and six AGCOM officers. The farmers were drawn from all three regions of the country while the AGCOM officers/specialists were randomly selected from different agriculture organizations present in the country currently. However, for the AGCOM officer interviews, only staff from two organizations whose main mission is dissemination of agricultural information were involved. All the interviews were transcribed and analyzed using NVIVO. The data from the surveys was analyzed using SPSS v.25 where descriptive analysis and regression were conducted.
Results

The results of the study indicated that the majority of officers (59 and 60 percent) strongly believed that AGCOM is used for creating awareness and promoting improved technologies while only 38 percent strongly believed that AGCOM is used for sharing experiences among farmers. When it came to choices of message for dissemination, only 34 percent of the officers indicated that they chose the type of message to disseminate based on farmers’ demand for the message. However, during the key informant interviews all officers indicated that they use the agricultural calendar to guide their decision on what message(s) to disseminate. In addition, the farmers indicated that they do not have access to information that they want since they are not involved in selection of content as well as channels used when disseminating agricultural information.

Availability of funding was reported as influencing the type of message and channels used for disseminating agricultural information. In addition to funding, the officers also indicated that even though they come across many promising innovations developed by farmers, they do not promote such innovations until they are proven by scientists as the policy does not allow them to do so.

Recommendations

The results of the study indicate that farmers are not considered as active players in AGCOM. This is the case despite availability of studies dating back to 1991 (Higgins, 1991) which emphasized the importance of promoting two-way communication between farmers and policy makers, as well as researchers. However, for actual practitioners this call has not been heard as many still considers AGCOM as tool for disseminating information on improved technologies to farmers while ignoring the feedback component (Aker, 2011; Manda & Chapota, 2015; Ragasa, et al., 2017). Therefore, for AGCOM is to be effective in assisting farmers to improve productivity in their farms, there is need for a change of mindset among practitioners so that farmers are involved in the communication process.

References


Masambuka-Kanchewa, F. (2013). “Agricultural Information Perceptions and behaviors of smallholders farmers in Malawi” (Masters Thesis), Purdue University, IN, USA


Assessing the Impact of a Collaborative Livestock Livelihood Project on Community Capacity Building in Rural Uganda

Lindsey R. Coleman  
Robert L. Strong Jr.  
Texas A&M University

Introduction
Although many Ugandans depend on agriculture for income, the nation still suffers from “widespread poverty, hunger, and malnutrition as empowerment barriers” (USAID, 2018, para. 1). Collaborative livestock donation programs are a unique strategy being used for empowering rural Ugandan communities. USAID implemented a dairy goat project that provided lasting, sustainable change in the northern region of Karamoja (Mitchell, 2017). The empowering nature of these programs creates accountability among recipients. Heifer International (HI) has worked to end hunger through livestock donation programs in Uganda for 36 years. Another organization working to empower individuals in Luwero, Uganda is the Just Like My Child Foundation (JLMC). Together the local hospital, JLMC and HI created Project Grace, a livelihood project that provided individuals infected and affected by HIV/AIDS with dairy goats to help ensure positive living. The Community Capitals Framework (CCF) was used to support this study’s objectives. CCF provided a method for analyzing how a community builds capacity through diverse forms of capital (Emery & Flora, 2009).

Purpose and Objectives
The purpose of this study was to qualitatively assess how the livelihood project impacted the community capacity through the development of human, social, and financial capital.

Methods and Data Sources
A qualitative approach was used in this study enabling the researchers to interact with people in their natural settings (Denzin & Lincoln, 2008). Semi-structured interviews, defined as a conversation with a purpose (Erlandson, Harris, Skipper & Allen, 1993) allowed the researchers to maintain an informal conversation, while yielding the richest responses. The researchers spent eight weeks in country, providing prolonged engagement with the culture and context of the livelihood project allowing the researchers to build rapport and evade misrepresentations (Dooley, 2007). The researchers visited the homes for four participants and interviewed 26 other participants. The 26 interviewed participants were asked six questions with follow up questions as warranted. The questions focused on what the participants learned, how the project impacted the community, and what the participants are now able to do after participating. The interviewees were purposively selected via the JLMC staff. Researchers conducted interviews with the support of a translator. The data from the interviews was transcribed and thematically analyzed by reviewing the data and extracting core themes (Bryman, 2016). The data was triangulated from the interviews, the visits to farmer’s homes, and member checking.

Results
Overall, human, social, and financial capital increased after participation in the livelihood project. Human capital increased as evidenced by an increase in knowledge, skills, and abilities. Among the 26 participants interviewed, 65% (n=17) identified an increase in human capital.
Further 54% \((n=14)\) identified improved health and nutrition. Social capital increased as indicated by an increase in community connections and networks. Among the 26 respondents 54% \((n=14)\) identified an increase in social capital. Financial capital increased as seen by increased income among participant’s family or the community, 80% \((n=21)\) of respondents identified an increase in financial capital. During the home visits and interviews the researchers observed a palpable pride the farmers took in their work. Many were excited to share about their experience and expressed gratitude for the opportunity to participate.

**Recommendations and Educational Importance**

Practitioners should implement interdisciplinary trainings throughout the project. The researchers observed the participants actively interested in further training as 27% \((n=7)\) of participants said they enjoyed the opportunities to attend trainings and learn and 15% \((n=4)\) indicated they wanted more training. If additional training was provided for the goat farmers on other topics such as crop production, business management, and animal health they could further serve as educators in their community for individuals interested in topics beyond goat rearing. Some farmers enjoy teaching their community members as 31% \((n=8)\) indicated they enjoyed teaching others in their community. By provided farmers with additional knowledge, practitioners could capitalize on the farmers desire to teach and create a resource in the community for others to learn from. Additionally, this project indicates the potential of small local NGO’s partnering with larger international NGOs. Future development projects should seek to capitalize on the local leadership and resources with minimal investment from large NGOs.

Authors suggest future researchers spend more time with the farmers to implement a 360° evaluation. Future assessment teams should try to spend multiple days with farmers, allowing the project participants to show and tell the researchers about how the project specifically impacted them and their family. Data could be generated that informs practitioners, program administrators, farmers, donors, and academics best understand attributes for positive community development and project sustainability.

**References**


Farmer Resilience and Innovation through Community-Based Fall Armyworm Control

Austen Moore
University of Illinois at Urbana-Champaign

Introduction
The Fall Armyworm (FAW), a pest native to the American tropics, has appeared in force in Africa in recent years, leading to significant infestations and crop losses (FAO, 2018). The pest has caused a frenzied reaction among governments and donors worried about widespread food insecurity.

In Malawi, Fall Armyworm is of particular concern. Malawi’s agriculture is heavily reliant on maize, a crop severely damaged by the FAW (Devi, 2018). Malawi has the world’s highest per capita maize consumption, the crop accounts for >75% of cultivated land, is grown by ~97% of households, and provides ~60% of Malawians’ total caloric intake (Denning et al., 2009). Disruptions to maize crops have dire implications for the nation’s food supply, leading Malawi’s President to declare a “state of disaster” in December 2017 (Mumbere & Mtuwa, 2017).

Donors and government actors are conducting awareness campaigns and mobilizing and equipping farmers with pesticides (e.g. Cypermethrin) when infestations are found (USAID, 2018). Regular monitoring is needed for this strategy, which relies on field-level extension workers to identify severe FAW infestations before relaying information to service providers for spraying. The process is highly “top down”, labor-intensive for extension workers, and reliant on functional input supply chains.

However, coordinated responses at the field level are difficult. Extension workers face large farmer-to-worker ratios and simply cannot regularly visit all sites in their sections (Ragasa & Chiyu, 2016). Since FAW infestations spread rapidly and cause large-scale damage quickly, relying exclusively on extension workers to monitor outbreaks is not working. Even infestations that are caught early are difficult to treat, with pesticides often unavailable pesticides in rural communities. Finally, the approach fails to engage farmers who can be more involved in protecting their own crops.

Purpose
An approach that expands monitoring efforts and produces faster data on outbreaks was required to effectively manage FAW and avoid food shortages. Better engaging communities was also needed, especially through the farmer-led stakeholder platforms of the District Agricultural Extension Services System (DAESS), a hierarchy of platforms comprised of farmers and extension providers. Such an approach represented an option for better monitoring by putting more “boots on the ground” but also empowering communities to own FAW response and not over-rely on external support.

Methods
Through collaboration between the Ministry of Agriculture and the Strengthening Agricultural and Nutrition Extension (SANE) project, farmer-led stakeholder platforms were engaged to
conduct Community-Based Fall Armyworm Monitoring. SANE provided pheromone traps and training on their use to communities, and each community identified 3+ Community Forecasters to manage the traps. The Forecasters record the number of FAW moths trapped per day, and totals are reported to the local extension worker through text, WhatsApp, or face-to-face interaction. Emergency village meetings are called if moths reach critical thresholds to (1) inform the community of the impending attack and (2) devise a response with agricultural officials. Results are also disseminated through the DAESS extension system and mapped using GIS.

Results
After a year of implementing the Community-Based Monitoring approach in Malawi, positive impacts are being observed. First, by developing the approach jointly with the Ministry of Agriculture, aligning it with existing extension policies, and rolling it out with stakeholder platforms, there is ownership at the national level by policy-makers and empowerment among farmers at local levels, enhancing its sustainability. The National Task Force on Fall Armyworm – which includes public and private sector partners – has adopted and is promoting the approach nationwide.

Second, the approach leverages existing extension workers in communities but avoids overburdening them, while still putting more “boots on the ground”. This represents a better use of human resources, positioning extensionists as facilitators rather than doing monitoring themselves (Sulaiman, & Davis, 2014). Finally, the approach is generating real-time GIS maps that identify hotspots and allow for forecasting future outbreaks.

Recommendations and Implications
The Community-Based Monitoring approach is impactful, cost-effective, and empowering. It has strong potential to help address Fall Armyworm in Malawi and other countries, and can be included with other approaches used on the African continent.

Still, improvements can be made. Huge amounts of data are generated by communities, and challenges remain in aggregating the data to allow for mapping. Apps rolled out to date (e.g. FAO’s FAMEWS) have limitations, so further attention is needed on data management aspects of this approach. Improvements are also needed in how training on FAW monitoring and control are provided – either by extension workers or ICTs – so that the approach is applied consistently. Finally, a formal impact evaluation could help quantify yield and food security effects.

References
Mumbere, D., & Mtuwa, P. (2017). President of the Republic of Malawi Professor Arthur Peter Mutharika has declared a state of disaster in all districts affected by Fall Armyworms.


Creating Resilient Agriculture Systems through Customized International Training Programs: A Case Study with Bosnia and Herzegovina

Amber L. W. Beseli  
Adrienne LaBranche Tucker  
J. José Cisneros  
K.S.U. Jayaratne  
North Carolina State University

Introduction/Purpose and Objectives
The purpose of this “application” oral presentation is to inform the audience of an effective training program [university name] College of Agriculture and Life Sciences’ Global Academy carried out with Bosnia and Herzegovina to increase agricultural resilience in their country. This training program on resilient agriculture with agricultural professionals from Bosnia and Herzegovina is a practical and successful example of applied agricultural education and extension education. This training program is also an example of how to build lasting and fruitful international collaborations between university faculty, industry, and governments.

Methods and/or Data Sources
This two-week training program on resilient agriculture consisted of agricultural professionals from academia, the ministry, and the private sector. Participants from these sectors were chosen to bring all “three players” into one room in order to develop more efficient change back home in Bosnia and Herzegovina. This customized training program was designed to educate the participants on how to protect harvests from the impacts of unexpected weather phenomena; become aware of disaster response approaches and tools; decrease greenhouse emissions in farming activities; reduce vulnerability to drought, heat, pests, disease, and other shocks; and improve capacity to adapt and grow in the face of longer-term stresses like shortened seasons and erratic weather patterns. This training was also designed to assist in the development of governmental policies and programs which would support resilient agriculture and would address growing environmental issues. This training was planned, carried out, and evaluated by the College of Agriculture and Life Sciences’ Global Academy at [university name]. The training sessions were led by university professors, extension specialists, local farmers, USDA agency employees, county extension agents, industry employees, and NGO professionals.

Products and Educational Importance
Because of relationships formed through this training program, faculty members of the College of Agriculture and Life Sciences are now working with the government of Bosnia and Herzegovina, two of their universities, with an agricultural company, and with the USAID Mission to create more resilient agriculture systems in Bosnia and Herzegovina. Bosnia and Herzegovina put forth funding to bring two faculty members to their country for a national dairy conference, to tour farms, and to meet with their researchers. A few months later, faculty members from College of Agriculture and Life Sciences International Programs traveled to Bosnia and Herzegovina to discuss additional future research collaborations. In response to this, in the near future, a group of young Bosnian farmers will come to the United States for a training on improving their dairy production systems with faculty members from [university name] and dairy producers in [state name].
Farmer Participation, Conscientization, and the Development of Resilient Agricultural Systems in Chiapas, Mexico: Implications for Agricultural and Extension Education

Garland Mason
Kim Niewolny
Virginia Tech

Introduction
Participatory methodologies have long been promulgated as effective means of practicing extension education. Literature suggests participatory approaches increase efficiency of technology transfer, redistribute power throughout learning processes, and strengthen stakeholder capacity to critically analyze, learn, and problem-solve (Hellin et al., 2008; Pretty, 1995). Practitioners must be cautious, however, to avoid misrepresenting or coercing stakeholders’ participation. Simultaneously, critical practitioners who invite stakeholder participation must be scrupulous in their application of participatory methodologies and keenly aware of the dynamics of power within their approach.

Purpose and Objectives
We examined whether and how the participatory approach serves participants’ interests and investigated the meaning of empowerment within the participatory development context. Literature on international and community development (Schaaf, 2013; Youngman, 2000), participation and critical pedagogy (Arnstein, 1969; Cleaver, 2001; Hellin et al., 2008; Kincheloe, 2009; Pretty, 1995, 1998, 2002), and Freirean conscientization and empowerment (Bartlett, 2008; Freire, 1970/2010, 1974/2013; Giroux, 2006; Mohan & Stokke, 2000) informed this research. To investigate these questions, we used a qualitative methodology framed by theories of participatory learning (Pretty, 1995, 1998, 2002; Pretty & Uphoff, 2002), empowerment (Hickey & Mohan, 2005; Mohan & Stokke, 2000), conscientization (Freire, 1970/2010), and critical theory (Brookfield, 2005; Carspecken, 1996). This study holds significance for agricultural and extension practitioners interested in fostering self-mobilization for the creation of community-based and community-led agricultural systems. Findings and conclusions inform participatory agricultural education in which participants are invited to be co-creators and leaders of their own education and development. Additionally, our findings problematize the relationship between participation and empowerment and warrant critical reevaluation of the way this term may be wielded in practice.

Methods
A Chiapas-based non-governmental organization (NGO) that utilizes participatory learning and development practices served as the context for this ethnographic case study. Semi-structured individual and group interviews and participant observation were the primary methods of data collection. We conducted 30 interviews with 35 individuals (including 10 interviews with the five program staff and 20 interviews with 30 program participants), with each interview lasting an average of 52 minutes. Participant observation involved three months of embedded work with the NGO. Following Creswell’s (2009) recommended procedure, data analysis included data reduction, interpretation using coding, and identification of a priori and emergent themes.
Through analysis and writing, these themes coalesced into theoretically framed and literature informed conclusions and recommendations for research and practice.

**Results and Conclusions**

Major themes included the cultural and socio-historical contexts of participatory work; interactive participation, participatory learning, partnership and solidarity; recognizing and naming systems of oppression; conceptualizations of empowerment; and linking participation and empowerment through the concept of self-mobilization. We found the program leaders’ deep understanding of and appreciation for their socio-historical context had direct implications for transparency and success within the participatory process. Additionally, our findings reaffirm the centrality of trust, mutual respect, humility, critical reflexivity and solidarity within the practice of participatory community education. Through long-term and solidary partnership, the organization strives to actualize the notion that rural agrarians may exercise a greater degree of power and control over their situations and their futures—thereby motivating and engaging for resilient agricultural systems.

**Implications for Agricultural Educators and Extension Practitioners**

This study has significant implications for community-engaged practitioners who strive to co-create resilient agricultural communities globally. Implications include the importance of downward accountability in the work, with the practitioners’ critical reflection and humility central to the process. Through our research, we identified several key factors that facilitated the success of the organization. These findings and conclusions may inform the work of practitioners interested in sharing power and fostering conscientization through community education. We have translated these into the following recommendations: 1) provide the space, resources, and capacity-building support for local individuals and organizations to lead themselves in this work; 2) temper expectations of the participatory approach and what may be accomplished, and allow the participants to set these expectations for themselves; 3) balance ‘upward’ accountability toward organizational missions and funders’ expectations with ‘downward’ accountability toward participants’ needs and goals; 4) commit to serving the project and the community for the long-term, and co-create a strategic vision that reflects this commitment; 5) deemphasize preordained outcomes in order to prioritize participants’ emergent needs. The results of this study demonstrate that participatory approaches rooted in humility, trust, and solidarity may allow practitioners to foster conscientization and build capacity for innovative problem solving for the development of resilient agricultural communities.

**References**


Personal Resilience and Coping Ability of Extension Agents in Post-Hurricane Response

Amanda D. Ali
T. Grady Roberts
Amy Harder
University of Florida

Introduction
Projected increases in the frequency and intensity of hurricanes (National Climate Assessment, 2018) coupled with Florida’s susceptibility to hurricane occurrences magnify the importance of effective post-hurricane response. During hurricanes, agents may assist in disaster support and recovery as “front-line responders” (Kistler, Place, Irani, & Telg, 2006, p. 371). Thus, Extension agents should be prepared to deal with post-hurricane relief efforts. However, emotional stress can hinder their ability to effectively respond, particularly for those also affected by the hurricane. Telg et al. (2008) found Extension faculty in Florida “were not well prepared to deal with client demands as front-line responders” (p. 9) during the 2004 hurricanes.

Resilience literature asserted higher levels of personal hardiness led to lower levels of stress. Hardy attitudes, existential courage, and motivation led to active coping, social support, and confidence (Bonanno, 2004; Maddi, 2004). Commitment, challenge, and control are hardy attitudes that help a person deal with stressful situations. Strength in these attitudes provide the courage and motivation to cope in stressful situations (Maddi, 2004.).

Coping in stressful situations results from problem-solving, social interaction, and beneficial self-care known as hardy strategies (Maddi, 2013). A conceptual framework was developed using the hardy attitudes and strategies (Maddi 2013), and the seven dimensions of resilience (Resilience Alliance, 2013). Low levels of personal resilience and coping abilities can reduce agents’ confidence to succeed in providing effective post-hurricane response.

Purpose and Objectives
The purpose of this study was to explore the personal resilience and coping abilities of agents following a hurricane. The specific objectives were to describe the personal resilience and coping abilities of agents to respond to hurricane-impacts.

Methods
This study used a basic qualitative research design to understand how people interpret their experiences and construct their worlds (Merriam & Tisdell, 2016). The target population was UF/IFAS Extension agents in Florida. The Extension Disaster Education Network contact for the University of Florida (UF) provided a list of agents involved with disaster recovery after Hurricane Irma. Nonprobability purposive sampling was used, based on the following criteria for selecting participants: agents from any program area who were personally or professionally affected by a hurricane event. Additional participants were identified through snowball sampling. The following definition operationalized impacted or affected by hurricanes: agents who experienced losses in any of these four areas – loss of valued objects, personal conditions, energies, and personal characteristics (Hobfall, 2001; Paul et al., 2013).
Saturation guided the sample size, resulting in nine agents. Maddi’s (2013) hardy attitudes and the seven dimensions of resilience was used to create a semi-structured interview guide. Face-to-face and telephone interviews lasting 45 minutes were conducted in August and September 2018 subsequent to approval by UF’s Institutional Review Board. Member-checks ensured credibility. Data analysis used a two-cycle coding process. The first cycle used structural coding to individually categorize data, informed by Maddi, (2004; 2013). Second-cycle coding used pattern coding which develops overall category labels, identifies emergent themes, and attributes meaning to those themes (Saldaña, 2013).

Results
Pre-determined themes in the conceptual framework were personal resilience and coping ability. Three sub-themes emerged under personal resilience guided by the hardy attitudes: continuous learning, influence or control, and commitment. Under continuous learning, community preparedness was a common sub-theme as Mae indicated, “there is a real lack of awareness in the community about what hurricanes can do, and what people need to be prepared for.” Under achieving influence or control of the disaster, clearly defined expectations (university and county level) of agents was a recurring sub-theme. Commitment revealed an important sub-theme of staying connected with others.

Coping ability had several sub-themes: optimism, communication, clearly defined roles, positive social support, disaster training, and self-care. An emerging theme negatively affecting coping ability was non-localized stressors. Agents with friends and family residing abroad were affected by the impacts of Hurricane Maria resulting in an additional layer of stress. “It was hard to not know how my family was doing and fulfill my role …” (Lynsey).

Conclusions and Recommendations
There is an opportunity to provide additional support for agents post-hurricane. Clearly defined roles support effective engagement in disaster response as expectations are known at the university and county level. Ensuring agents have clearly defined roles in disaster response can help increase confidence to succeed in hurricane relief efforts. This study focused on UF/IFAS Extension agents, however the same need to support agents exist in other hurricane-prone areas (Ganpat, Barry, & Harder, 2018). Increasing the personal resilience and coping abilities of agents help contribute to effective post-hurricane response.

References


The Global Forum for Rural Advisory Services: A Network Emergence Case Analysis

Kristin Davis  
International Food Policy Research Institute  
David Dolly  
University of the West Indies  
Alexa J. Lamm  
Kevan W. Lamm  
University of Georgia

Introduction and Review of Literature

To ensure ongoing relevance, extension must be nimble and proactive in addressing critical issues (e.g., Henning, Buchholz, Steele, & Ramaswamy, 2014; Strong, Rowntree, Thurlow, & Raven, 2015). The need to work across country and even continental borders has become even more important as the world shifts to one driven by global issues. Extension is logically connected to societal shifts (Davis & Sulaiman, 2014), and these shifts will inevitably affect the structure and delivery of extension programming and the need for a global extension system connected through networks (Lamm, Lamm, Davis, & Swaroop, 2017).

In this new paradigm there are no clear protocols for the dissemination of technology or information (e.g., Molnar & Jolly, 1988; Temming, 2018). This work focuses on network emergence of the Global Forum for Rural Advisory Services (GFRAS). The conceptual framework for this study was based on social network theory proposed by Borgatti, Mehra, Brass, and Labianca (2009) and network emergence (Kogut, 2000).

Purpose and Objectives

The purpose of this study was to use GFRAS as a case to examine network emergence and the potential for extension networks on a global scale. The objectives of the study were to (a) determine how GFRAS evolved to address global issues, (b) determine how GFRAS interacted with and connected extension actors from around the world and (c) describe how GFRAS expanded its focus to relationships outside of extension to ensure its relevance.

Methods

A case study approach was used to reach the objectives of the study. A content analysis of the themes chosen a priori, the study objectives (Lincoln & Guba, 1985), and detailed notes of record from the annual GFRAS meetings was conducted to identify issues, actors, discussions, and results related to building networks and communities of practice within extension and beyond (Hatch, 2002; Merriam, 1998). Two coders familiar with the GFRAS organization conducted a content analysis of the annual meeting themes and notes of record. The two coders discussed the themes, patterns, and relationships identified amongst themselves using the results to tell the story of the GFRAS organization as it grew over time. The aggregated results were then discussed with two additional researchers to establish trustworthiness through peer review (Lincoln & Guba, 1985).

Results
Analysis of the eight annual meetings tell a story of the evolution of a network in response to agricultural themes of the day and to its members. At a high level, the arc of the meeting themes depicts how GFRAS matured from an inwardly-focused to an outwardly-focused network of extension. We can see that over the first eight years (and into the ninth), the network focus evolved through the following steps:

1. Emancipating the network (2010)
2. Consolidating the network (2011)
3. Positioning the network (2012)
4. Broadening the network (2013)
7. Partnering the network (2018)

The themes addressing global issues have also become more elaborate and sophisticated. They started with some basic issues: evaluation, policy advocacy, and capacity strengthening and have gone wider and deeper to include issues of entrepreneurship, youth, and inclusion. The issue of keeping networks relevant and finding working group members who will participate without payment remains a pervasive one. Several topics never really worked very well: the topic of climate change never managed to take off with GFRAS, and the gender working group was dissolved in 2016.

**Implications and Recommendations**

Content analysis of the eight network annual meetings revealed how GFRAS evolved to address global issues of concern and to first build and connect its community before reaching out to the broader agricultural development community. The case of GFRAS shows that although there is potential for extension to serve as a mediator in the technology-to-clientele transfer, it is also necessary for extension to adapt to the conditions in which it exists. Specifically, hierarchical information flows are no longer the norm, having been replaced with an integrated network of actors and information. Extension must adapt to such shifts and become less hierarchical and more networked. This shift will require a more pluralistic approach, whereby the best technology and information is shared and proliferated amongst extensionists. There are no boundaries when it comes to resources such as water, soil, and air. Extensionists are on the front line of these trends and are positioned to play a crucial role in technology transfer and sensitization on global issues.

**References**


Promoting Innovation and Team Performance through Cognitive Diversity: A Case of Extension Agents in Morogoro-Tanzania

Asha H. Shayo
Rickie Rudd
Virginia Polytechnic Institute and State University.
Amon Z. Mattee
Sokoine University of Agriculture- Tanzania.

Introduction
In Tanzania majority of extension agents are employed with the government (Mattee, 1994) however, some NGO and international organizations that are involved in agricultural practices also have extension agents. The difficulty in working environment, salary and other factors contribute to extension agents’ motivation which makes harder for the agricultural extension field as a whole. Extension agents’ work with various stakeholder’s including teams, understanding cognitive diversity is essential in order to increase cohesion and collaboration to improve the lives of small farmers.

Kirton Adaption-Innovation theory (KAI) (Kirton, 2011) posits that more adaptive individuals prefer structure while more innovative individuals prefer less structure when solving problems and making decisions. Kirton (2011, p.26) stated that that “Adaption -innovation theory rests on the assumption that problem-solving is the key to life in an ever-changing universe”. Every individual is unique so like the way they solve problems, and all organisms must solve problems (Kirton, 2011). Understanding the complexities surrounding us, others and ourselves is essential as we created the world which depends on the collaboration with other problem solvers (KAI, 2011).

Purpose
The purpose of the study was to examine how teams manage their cognitive diversity in promoting innovation and team performance. Kirton Adaption-Innovation theory is a concept which is new many Tanzanians. People get accustomed and comfortable when working with a team. However, they are not aware of their differences in styles when solving a problem, creativity and making decisions. According to Webber & Donahue (2001), the literature summarized that when diversity increased, it may lead to an increase in innovation, performance and cohesion.

Objectives
1. Identify extension agents’ motivation to engage in agriculture
2. Describe Kirton’s Adaption-Innovation (KAI) theory and its usefulness in professional practices.
3. Explain the Cognitive Schema for Problem Solving and typology of problems
4. Identify strategies for effectively working with cognitively diverse groups and teams to create social change.

Methodology
This study aimed to explore Morogoro extension agents multiple perspectives on preferred style in problem-solving, decision making and creativity, management of cognitive gap and diversity when working in teams, and understanding the concepts of KAI. The study used a purposively sampling method to recruit extension agents in Morogoro region. Seventeen (n=17) participants were selected to attend a three days KAI training followed by face to face interview, gathering participants preferred style in problem-solving, their management cognitive gap and diversity when working in teams and their perception about KAI. Also, share their motivation to engage in the agricultural field. The interviews lasted between 35-60 minutes. The unstructured, open-ended and face interview was conducted in the Swahili language. A researcher translated a consent form into Swahili to participants. The interviews were audio recorded and transcribed verbatim. A researcher then translated the recorded interviews to English, generated themes which were supported by quotations.

**Results**

The theory was very well received, almost all participants never had a personality style assessment of any kind, so this was a great eye opener on how personalities can be assessed. For some participant it was their first training since they have been employed, for example, one participant who worked for 28 years, KAI training was his second training in general and never had a personality assessment. Many participants saw the potential in KAI; it made them realize their style in problem solving and creativity. However, participants were still confused with the word “innovation” as most participants felt like they are innovators despite the broader elaboration. KAI theory and other self-awareness theories and tools are meaningful. Thus, the knowledge of KAI is critical in creating self-awareness and appreciate the cognitive differences that exist among people. Awareness of individual style brings about substantial performance improvement and team collaboration.

**Recommendations/ implications**

Whether an individual in a team is more adaptive or more innovative, they all have a different preferred style that they are comfortable to practice or work when they are exposed to a certain situation. A team success requires diverse group members to prevent fixation and lose focus when solving a certain problem. Extension agents work with farmers and other stakeholders every day; it is essential to understand themselves and the people they are working with every day for a change. From the analysis, participants were intrigued by the novel concepts of KAI, the vital of understanding cognitive gap between team members and the differences in personality styles in problem-solving, creativity and decision-making. Therefore, they recommended that the training and research be expanded and reach more extension agents. But also train the administration officers to create awareness on the existing difference in personalities and preference in problem-solving. The findings were from only seventeen extension agents in Morogoro; therefore generalization should be avoided.

**References**


Linking Undergraduate and Graduate Students to Extension Careers by Engaging in International Agricultural and Food Systems

M. Russell
P. Ebner
H. Oliver
T. Nzaranyimana
S. Tinkler
Purdue University

Introduction and/or theoretical framework and/or review of the literature
This presentation will offer an integration of instruction of teaching engagement methods through experiential learning (Kolb, 1984) frameworks. Service-learning is one form of experiential learning in which students apply their academic discipline while they are engaged in a community through service and then reflect on their experiences (Bringle and Hatcher, 1996). Benefits of service-learning not only should apply to the community being served, but also enhance student learning in a reciprocal relationship (Eyler, Giles, Stenson, and Gray, 2001). Students are able to learn not only about the academic material, but also gain cultural awareness, and critical soft skills (Astin, Vogelgesang, Ikeda, and Yee, 2000; Crawford, Lang, Fink, Dalton, and Fielitz, 2011). Service-learning experience adds reality to the theoretical nature of the classroom by encouraging students to apply critical thinking skills within the context of real-world challenges (Jenkins and Sheehey, 2011).

Purpose and objectives
This presentation will share the application of service-learning and how the methods are determined by the outcomes of engaged learning (Prince, 2004). Learning outcomes are to enhance undergraduate problem solving, teamwork, and critical thinking skills through direct engagement with community members and local NGOs, and to develop undergraduate intercultural competencies (communications, empathy, and self-awareness) through faculty-led study abroad programming. The Community based service-learning (CBSL) model is used because it combines experiential learning and academic goals resulting from service activities designed to meet the objectives of community partners (Brandes and Randall, 2011). CBSL has the expectation to enhance (1) academic learning, (2) foster civic responsibility, (3) develop life skills and (4) transform student attitudes (Eyler et. al., 2001). Most teachers of agricultural sciences traditionally have taught and assessed agricultural science cognitive content, yet increasingly, employers demand affective competencies as well as discipline content learning outcomes (Crawford et al, 2011). Seemiller (2014) and Vande Berg et al (2012) have identified the ability to work in multicultural and intercultural teams as a critical employability skill. Our objective to share how we have done this and preliminary results.

Methods and/or data sources; or theoretical/philosophical themes
The educational design of the “Planning, Conducting, and Evaluating International Engagement Methods” course sequence is the same regardless of the international destination. We have used this model in Romania, Haiti, and Peru since 2004. Students learn and practice intercultural effectiveness and methods of community engagement and then apply this learning through service-learning to address identified community goals of sustainability. Through the preparation
course, students are learning asset based community development methods, digital and photo ethnographic storytelling methods, Environmental, Asset, Needs-based research approaches, and an introduction to the context of life styles/cultures and challenges of the community being served. Collaborating with students from in-country universities, our students work in teams to apply these methods through community and civic engagement with local NGOs and community members. Student assignments and assessments include pre- and post- validated instruments including Intercultural Development Inventory (IDI®), Beliefs, Events, Values Inventory (BEVI®), guided reflections, a Community Partner Video Story, and a self-reflection written article and video. Engagement assignments vary depending on the host community identified priorities.

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

This course sequence is critical to adequate preparation, competent engagement, and true reflection and utilization of Kolb’s experiential model. General results include: 1) active learning courses of this nature are critical for students to develop skills to apply academic content learning to make practical differences in the lives of those they serve, 2) service-learning courses in communities cause students to develop culturally appropriate professional community engagement skills, 3) student experiences with “other” students and NGO and community leaders provide great opportunities for networking and employment for the future, and 4) students develop a sense of working and learning *with*, rather than teaching or working *for* community members and stakeholders.

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

Short-term service-learning courses of this nature require established in-country relationships and partner university partnerships. This method of instruction allows deeper on-going partnerships between community leaders, in-country universities, and the faculty leading the course. The service-learning experience sandwiched between proper preparation and evaluation/reflection allows students to grow in application of technical discipline knowledge, intercultural skills, and a true sense of methods of engagement. This can be done domestically in an environment out of the students’ comfort zone, however the international locations also provide an enhanced global citizen perspective. Whether this growth and learning results in international engagement or Extension careers or not, students leave this experience with more skills to impact a sustainable future of their communities.

**References**


Seemiller, C., 2014, The Student Leadership Competencies Guidebook: Designing Intentional Leadership Learning and Development

Utilizing Programming Frameworks of the International Community Health and Community Animal Health Programs for International Agricultural Extension

Brian Flanagan  
Texas Tech University and Texas A&M University  
Theresa Pesl Murphrey  
Texas A&M University

Introduction
International agricultural extension strives to meet programming needs with innovative approaches such as the use of mobile phones linked with information databases (McCole, Culbertson, Suvedi, & McNamara, 2014) and the implementation of leadership programming to improve farmers’ networking (Rasmussen et al., 2017). Agricultural extension programs could also benefit by considering programming frameworks of similar programs. Community Health Worker (CHW) and Community Animal Health Worker (CAHW) programs have been in existence for 98 and 48 years, respectively. These programs have a rich body of knowledge related to community outreach and knowledge sharing, much of which is applicable to efforts aimed towards meeting the needs of small-scale farmers. Drawn from the literature on CHW and CAHW programs, we identify frameworks relevant to developing, implementing, and sustaining community-worker agriculture extension programs.

Purpose
The purpose is to inform and strengthen international agricultural extension programs by bringing attention to the frameworks used to study CHW and CAHW programs relative to their applicability to agriculture extension programs.

Data Sources
Literature related to CHW and CHAW projects provided the foundation of the material to be shared, including peer reviewed reports, white papers, book chapters, and peer-reviewed journal articles. Personal experience with international programming efforts was used as the lens through which the material was viewed.

Results and Conclusions
Analysis of the literature identified lessons learned that can enhance the effectiveness of community extension programs. Six developmental stages identified in the CHW and CHAW literature serve as the framework: (1) designing a program; (2) recruitment and selection of community workers; (3) training of community workers; (4); supervision; (5) scaling-up programs; and (6) sustainability over time.

Agriculture extension programs are using more bottom-up approaches that involve community participation in the design process (Black, 2000). Both CHW and CAHW programs have experience involving stakeholders in the design phase, which is useful for organizations to mirror when developing a community agriculture worker program (Catley, Blakeway, & Leyland, 2002; Frankel, 1992). Further, reaching rural small-holder farmers requires an extension worker with certain characteristics. CHW and CAHW programs have success in recruiting and selecting workers. By involving the community in the recruitment and selection process and identifying
the appropriate selection criteria, the most appropriate workers can be chosen (Leyland, Lotira, Abebe, Bekele, & Catley, 2014; Perry & Zulliger 2012).

Training and supervision of extension workers is an important aspect of any program. Training ensures the worker has the skills and tools to reach rural small-holders. Emphasis should be placed on planning, content, methodology, and ways to enhance trainings. Improving these factors creates successful extension programs (Bhutta, Zohra, Lassi, Pariyo, & Huicho, 2010; Catley et al., 2002). CHW and CAHW programs have found that inadequate or lack of supervision can lead to failed programs. Involving stakeholders in the planning process of a supervision strategy is critical. The strategy should create a supportive environment that provides quality control while gathering and sharing information (Allport, Mosha, Bahari, Swai, & Catley, 2005; Walker, Downey, Crigler, & LeBan, 2013).

Scaling and sustainability are two important programming factors. Lessons from CHW programs show that scale-up requires a well thought-out plan that is flexible and an overall goal to not only achieve scale but also to maintain it. Community based extension programs can properly scale-up if they avoid the common pitfalls and have a detailed plan (Crigler et al., 2013; Haines et al., 2007). Program sustainability is multifaceted. Issues include the ability to do one’s job day-to-day with little ‘outside’ help, financial program sustainability, consistent service over time, services that do not have a negative impact on the environment, and programs that function in the larger context of the community (e.g., local economy, political climate, available resources and cultural factors).

Recommendations and Educational Importance

Lessons gleaned from CHW and CAHW have implications for community agriculture extension programs. These lessons relate to design, recruitment/selection process, training, scale-up and supervision of programs (Crigler et al., 2013; Catley et al., 2002). Community-based workers in CHW and CAHW are central to program success, largely because they live where they work and, consequently, are already familiar with local customs and realities. Considering the issues and challenges common to both the health and agriculture sectors, agricultural extension programs can benefit from CHW and CAHW programs. Based on lessons learned, specific practices can be implemented to enhance the contribution of community-based workers and encourage program success, ultimately, to the betterment of all.

References


Spatial Patterns of African Indigenous Vegetables Value Chain Actors: The Case of Narok and Kajiado Counties, Kenya

Juma Riziki Magogo
David E. Lawver
Mathew Thomas Baker
Amy Boren-Alpizar
Cynthia McKenney
Texas Tech University
Agnes Oyaywa-Nkurumwa
Egerton University

Introduction and Conceptual Framework
African indigenous vegetables (AIVs) have been reported to have comparative advantages over exotic vegetables (Abukutsa-Onyango, Tushaboomwe, Onyango, & Macha, 2006). Their potentials in positively impacting income and nutritional wellbeing of smallholder farmers and resilience to harsh environment have attracted attention in Extension Education (EE) research. Geographic Information System (GIS) can be used to explore the spatial patterns of the AIV value chain to aid in aligning and re-aligning EE (O’Sullivan & Unwin, 2010). Hence, in this study geospatial data were collected using handheld GPS units, screened, validated and transformed into a format which is compatible with analysis using ArcGIS (O’Sullivan & Unwin, 2010; Gorr & Kurland, 2013). Transformed data were projected and used for analysis and visualized using maps, graphs and spatial statistics.

Purpose and Objectives
The purpose of this study was to analyze spatial patterns of AIVs value chain actors (VCAs) to enhance the understanding of suitable locations for successful vegetable production, marketing and mapping VCAs for EE as targets for EE programming.

Methodology/ Procedures
Purposive sampling was used in selecting the study sites. Study locations were selected through a systematic sampling technique and households were selected through a simple random sampling technique. The sampling frame was obtained from Kenya’s Department of Agriculture. The desired sample size (n=217) was determined using a sample size table developed by Research Advisors (2007). A face-to-face questionnaire was administered by 14 trained enumerators. Enumerators were recruited from the study areas to bridge communication barriers as well as to acquire research assistants who were well versed with the study areas. The research instruments included questionnaires, handheld GPS units, and camera. GPS coordinates were used to build spatial patterns of VCAs to aid targeting beneficiaries of Extension services. Average nearest neighbor ratio (ANNR) was used to analyze spatial patterns of VCAs. ANNR is specifically designed for measuring patterns in terms of the arrangement of a set of points in two or three dimensions (O’Sullivan & Unwin, 2010).

Results
Based on ANNR, it is evident that there was a clustered distribution patterns of points on overall (Z = −21.947, p < .001), as well as in Narok (Z = −20.324, p < .001) and Kajiado (Z =
−7.101, 𝑝 < .001) counties, respectively. The null hypothesis was rejected, and given the 𝑧-
scores, there was a less than 1% likelihood that this clustered pattern could be the result of
random chance.

Clustering of VCAs may be due to AIV farming systems which are dependent upon rain-fed
agriculture (Shiundu & Oniang’o, 2007). As such, AIV farming is often along water sources such
as rivers, swamps, and dams. Clustering may also be due to area-based and commodity- based
systems (Montiflor, Batt, & Murray-Prior, 2008). In area-based systems, farmers group together
based on the proximity of farms, while in commodity-based systems, farmers plant the same or
similar vegetables and combine their output to achieve a higher volume.

Implications
The findings imply that Extension service providers can target clusters as reference points. In
Kenya, clusters have been used to determine the number of Extension staff in a sample cluster
(Evenson & Mwabu, 1998). However, there are challenges such as economies of scale and
competition. Consequently, agricultural clusters have been reported to focus more in meeting
consumer demands rather than increasing efficiency and productivity (Galvez-Nogales, 2010).

Recommendations for Practice
Grouping aspect of VCAs suggest the need for formation of viable and sustainable clusters
through concerted efforts from both private and public to provide support ranging from
strategies, policies, and programs. According to Galves-Nogales (2010), clustering in the
agricultural sector will most likely need to be induced by one or a mixture of external agents
such as government, local firms, and international investors. Cluster-based approach can be a
realistic way of avoiding coordination failures of Extension programming. GPS can also be
integrated as data collection tool in agriculture EE research and geospatial information can be
very useful in developing specific interventions to be undertaken to achieve desired results with
targeted group.

Future research
Further studies are needed on CF and its suitability for improving EE service delivery and
farmers’ livelihoods. Such studies would furnishing information on the direction and approach
to be undertaken in promoting CF. CF has been documented to provide benefits such as
improving farm income, high and/or better prices, more marketing opportunities and enhanced
information access (Montiflor, Batt, & Murray-Prior, 2008). CF has also shown to create
interaction and networking opportunities which are necessary in addressing issues of common
concern (Engel, 1997).

References
community land use for sustainable production and utilization of African indigenous
vegetables in the Lake Victoria region. Fifth Workshop on Sustainable Horticultural
Production in the Tropics, 23rd -26th November 2005, ARC, Egerton University, Njoro,
(pp. 167-179).
Engel, P.G.H. (1997). The social organization of innovations, a focus on stakeholder interaction.
Amsterdam, Netherlands: Royal Tropical Institute.


Coping Strategies to Food Insecurity in Southern Nations, Nationalities, and People’s Nationalities (SNNPR) of Ethiopia: A Gender Perspective

Rafael Quijada
Amy E. Boren-Alpizar
Texas Tech University
Melisew Dejene
Hawassa University
Conrad Lyford
Texas Tech University

Introduction
Ethiopia is recognized as the country with the highest growth and economic performance in sub-Saharan Africa (World Bank, 2018). However, globally it remains one of the least developed countries with some of the greatest economic challenges (International Food Policy Research Institute [IFPRI], 2017). With a population of 92 million people, it is the second most populous country in sub-Saharan Africa (International Fund for Agricultural Development [IFAD], 2018). In Ethiopia, the economy is based on agricultural production; 82 million people work in agricultural production and most of them farm on .5 hectares or less. These smallholder farmers generate 95 percent of the national agricultural production. Despite its great agricultural potential, Ethiopia lives in a continuous state of food insecurity (IFPRI, 2017).

In 2017, the Global Hunger Index classified the situation in Ethiopia as "Serious", indicating elevated incidents of inadequate food supply for families, stunting and wasting in children, and mortality for children under five (IFPRI 2018). When faced with food shortages, families adapt their lifestyle to the resources available using mechanisms known as coping or adaptation strategies (Davies, 1996). Families employ these strategies to mitigate times of food shortages. Women’s traditional roles as food providers and preparers for their families put them in a critical position when facing an insufficient food supply (Ivers & Cullen, 2011).

Using Corbett’s (1988) model of the sequential use of coping strategies, as well as Davies’ (1996) model for classifying coping strategies, this study explored how women in the Southern Nationalities, Nations, and People’s Region (SNNPR) in Ethiopia cope with food insecurity. Understanding their coping and adaptation strategies for mitigating food shortages can provide insight for agencies working with food insecure populations in Ethiopia.

Purpose and Objectives
The purpose of this research is to identify and classify the coping strategies used by women in the SNNPR in Ethiopia. The following research objectives guided this study:

1. Describe the current situation of food security in the SNNPR.
2. Describe the role of women in addressing food insecurity in SNNPR households.
3. Identify the dynamics of adopting coping strategies to mitigate food insecurity.
4. Classify the adopted coping and adaptation strategies to food insecurity of women in the SNNPR.

Methodology
For this study, data were collected in 2014 from a randomized sample of women in twenty zones of the SNNPR. Overall, 11,243 women responded to the 400-item survey. Data were analyzed using descriptive statistics and a Chi square was conducted to determine the role of women in addressing food insecurity. The dynamics of the adoption of coping strategies was identified using the Corbett (1988) model. Davies’ (1996) model was used to catalog the adopted coping strategies.

Results and Conclusions
Women indicated a lack of food security, with 91% of them experiencing food shortages and 15% reporting that they had exhausted their food supplies. Women identified their principal food sources as the family garden, local markets, donor agencies, and government aid. Only 22% of the women identified as family head, but only 16% of women reported that they had decision-making power over their family’s productive assts. Yet 44% of women work in the family’s agricultural production. Results indicated a significant difference \((p < 0.01)\) in the food security situation of households led by women; households led by women were significantly less food secure. These results suggest that the lack of active participation of women in decision-making processes contributes to the food insecurity experienced by these households.

Regarding the dynamics of selecting a coping strategy when faced with food shortages, the women identified 15 coping strategies they used to mitigate food insecurity. Of these coping strategies, nine were implemented as an insurance mechanism and the rest divided between the consumption of productive assets and restriction of food intake.

Recommendations
Understanding how women’s roles in the household relates to food insecurity and how women mitigate times of food shortage can be helpful in designing meaningful interventions to address these issues in the SNNPR of Ethiopia. In light of the results of this study, it would behoove development agencies to engage communities directly on issues of gender and food security. This is not an easy task, but the data from this study and others (see Ivers & Cullen, 2011) consistently demonstrate the pivotal role of women in achieving food security.

Important follow-up studies should be undertaken to assess how women choose their coping strategies. This study identified which strategies women use, but it did not identify why. An explanatory qualitative study could provide more insight into these dynamics.

References


**Village Chicken Production in Kenya: Addressing Challenges through a Social Exclusion Framework**

**Kelly Robyn Wilson**  
**Mary T. Rodriguez**  
**Scott Scheer**

**Introduction**

While there is no easy solution to food insecurity, low-input agricultural products can make important contributions to household livelihoods. A growing trend in development is to focus on “women’s products”, agricultural products typically managed by women in village settings of developing countries (Revenga & Shetty, 2012; World Bank, 2012). This approach stems from the notion that increasing women’s production capacity will lead to an overall improvement in household livelihoods, as women are said to funnel their income into household nutrition, healthcare, and children’s education. In Kenya, village chicken (VC) production is one activity commonly linked to women (Nyaga, 2007; Wanjugu & Nduthu, 2015). These small-scale flocks are raised on minimal inputs but offer crucial contributions towards household nutrition, a source of income, and are of socio-cultural importance (Alders & Pym, 2009; Sonaiya, 2008).

Unfortunately, studies find that VC producers in Kenya lack access to information and technologies that could drastically reduce the risk of disease and improve productivity (Amwata & Kanui, 2016; Okeno, Kahi, & Peters, 2012). Further, while women are hailed as the owners of village chickens, mechanisms of social exclusion limit their access to and ability to use resources (Muyanga & Jayne, 2006; Nambiro et al., 2006). Lacking awareness of the socio-cultural processes surrounding VC production presents barriers to help producers (Guèye, 2005; Ochieng, Owuor, & Bebe, 2012).

**Purposes and objectives**

This purpose of this study was to explore VC producer challenges through an analysis of social exclusion. Kabeer’s social exclusion conceptual framework examines the institutional and societal processes responsible for distributing and providing access to resources and establishing value (Kabeer, 2000). Identifying these processes and the actors involved in perpetuating them offers opportunities to improve social policy and programming (Kabeer, 2000, 2005; Rodgers, 1995; Sen, 2000). We specifically focused on Kabeer’s three categories of social exclusion mechanisms: mobilization of institutional bias, social closure, and unruly practices (Kabeer, 2000).

**Methods**

This qualitative research study conducted a case study of VC production in Kitui and Embu Counties of Kenya. In each county, gender-segregated focus groups were conducted with VC producers by trained facilitators. In addition, semi-structured qualitative interviews were conducted with agricultural extension agents working in each county.

Protocols for focus groups and interviews were informed by preliminary studies conducted in 2017. Protocols were evaluated by a panel of experts, whose comments were incorporated to improve clarity and appropriateness of content.
Focus groups and interviews were translated and transcribed, then coded using Kabeer’s social exclusion framework (Kabeer, 2000). Coded data was further explored to compare perspectives between male and female producers and producers and extension agents. Examining multiple sources of data also improved trustworthiness of data (Creswell, 2014).

**Results**

Preliminary data analysis identified instances of mobilization of institutional bias and social closure. First, the focus of government programs and funding has persistently overlooked VC producers. Neither group could recall any past or current efforts to support chicken production. Instead, agricultural services have focused on cattle or goat production. Importantly, this neglect was not reflected in the extension agents’ attitudes themselves: each interviewee emphasized the need to support VC producers.

Participants identified women’s social closure from market access. The predominant method of selling VC products is through a middle-man, an individual who comes to the farm-gate to collect products and sells them at market. While this is an important service for VC producers, participants emphasized how the farmers rarely have negotiating power in this relationship. Moreover, participants contended that middle-men were almost always men.

Contradictory ideas about chicken ownership emerged from focus group discussions. Both male and female groups agreed that most work surrounding VC production involves women, but there was disagreement on who has decision-making agency. Each women’s focus group asserted that women decide when to sell eggs or chickens. However, each men’s group said that the decision was ultimately up to men (FG #8). Each extension agent identified women as the primary owners of chickens, but said that they often had to work through male head-of-households when providing services.

**Recommendations**

These findings illustrate a demand for services targeting VC production in Kitui and Embu Counties of Kenya. While women were most linked to chicken production, they may not have full agency over flocks. Gender-inclusive programming is thus recommended for VC producers. An emphasis on chicken production in policy and programming is a critical social acknowledgement of the activity itself (Hovorka, 2012; Parpart, Rai, & Staudt, 2003). Such recognition can empower and lend authority to VC producers (Kabeer, 1999; Parpart et al., 2003).

**References**


Socio-Cultural Practices that Impact Sukuma Women Farmers’ Land Ownership: A Qualitative Study

Asha H. Shayo
Rickie. Rudd
Virginia Polytechnic Institute and State University.
Amon Z. Matte
Sokoine University of Agriculture- Tanzania.
Donna Westfall-Rudd
Thomas Archibald
Virginia Polytechnic Institute and State University

Introduction
In many African countries women whose livelihood is agricultural production, the cultural norms in rural areas remain biased against women’s ownership of and control over land (Enwelu et al., 2014). The existence of patrilineal and matrilineal societies has different cultural norms and beliefs across regions in Tanzania (Myenzi, 2010). The Sukuma tribe is a patrilineal society, which often results in male dominance and control. With differing cultural norms and beliefs around the globe, this study intended to identify cultural norms and beliefs that strongly impact Sukuma women farmers’ access to and control over land (IFAD, 2010).

Theoretical Framework
This study utilized Fishbein & Ajzen’s (2010) The Reasoned Action Approach and Behavior Change framework. Attitudes involve the intention to practice certain behaviors depending on the cognitive readiness to practice and the environment. The Sukuma women farmers’ intention can be determined by the attitude toward the specific behavior, subjective norms, and perceived behavioral control. The Theory of Planned Behavior posits that the attitude toward a particular behavior is measured by questioning people about their intentions to act, think, and perceive. Attitude is highly influenced by the perception of closely affiliated peers and family. Perceived behavioral control refers to the formation of an intention and ability to perform a behavior which may be supported by social norms. Behavioral change is influenced by the need and desire to change (Fishbein & Ajzen, 2010).

Methodology
This qualitative research study was conducted in the Mwanza Region. Twelve participants (n=12) were selected from the Ilemela District for this study. The criteria for participants’ selection were: women who own land (not legal ownership), women who did not own land, men who allowed their wives/daughters to own land, and men who did not allow their wives/daughters to own land, traditional leader, and government officials. This sample selected to achieve multiple perspectives of women farmers land ownership. Data were collected through face-to-face interviews, which were audio recorded and transcribed verbatim. Researcher observations, field notes, and artefacts were also analyzed along with the interviews (Rossman & Rallis, 2012). The study was conducted in the Swahili language and was translated by the researcher into English for data analysis. The consent form was verbally explained in Swahili. The interviews were transcribed and open-coded to generate themes, which were supported by quotations.
Results
From the interviews, the following six themes emerged: (1) both men and women’s negative perceptions of land ownership by women discourages Sukuma women farmers from land ownership. (2) Traditional norms and beliefs influence men and women’s attitudes toward Sukuma women farmers’ land ownership. For example, the practice of paying a dowry for a wife makes the wife the property of the husband. (3) In Sukuma families, men are considered the head of the household and final decision makers. The inability to make decisions suppresses the desire for women to acquire land. (4) In some cases, men viewed giving women decision-making power and ownership of land as advantageous. (5) Although national laws exist to enable land ownership by women, there are contradictions in the law that allow customary laws to be enforced to block land ownership by women. (6) Both men and women distrust government officials in matters of acquiring land.

Cultural environment and perceived behavior influence individual intentions to perform a particular behavior. The negative perceptions that some women and men in Sukuma tribe believe about women farmers land ownership is influenced by the cultural norms and patterns in their communities. Sukuma tribe adopted a patriarchal system, where men have power and authority to make decisions in the families and their communities.

Implications, Recommendations and Conclusion
Social-cultural practices such as dowry, lack of education, cultural norms, lack of knowledge of human rights etc. have an impact on the Sukuma community on women farmers’ decision-making over resources. Across Sukuma culture, there are unique customs and norms that are practiced in the communities. The culture varies and makes each clan different. Many reports generalized the cultural practices in all tribes (and some in all African countries) and created some forward-thinking ideas on how to help women get their rights (Meinzen-Dick & Quisumbing, 2012). However, there are differences across individual tribes (patriarchy and matriarchy system). As for Tanzania, there are almost 132 separate tribes. The modalities to change people’s attitudes and perceptions remain different. Therefore, studies should be conducted across tribes to understand the culture specifics to find the right modality to eliminate gender-based violence and discrimination against women farmers. Inability to know their rights, Sukuma women farmers are deprived the right to legal ownership of resources such as land.

References


Gender Roles in Dairy Production and Women’s Access to Agricultural Advisory Systems in Western Afghanistan

Carmen N. Benson-Byce
Terry K. Hutchens
Texas A&M University
Basir Ah. Nikoomanish
Herat University, Afghanistan

Introduction
The use of new technologies and implementation of improved practices, which require access to knowledge, are the primary drivers to increased productivity in agriculture (Hazell & Bernstein, 2013). Yet, Peterman, Behrman, and Quisumbing (2010) found that one of the most significant deterrents to agricultural technology adoption among women in developing countries is limited access to information from reliable sources such as extension officers. Literature from previous AIAEE scholarship in Iraq, Iran, Honduras and Rwanda identify similar barriers to women’s access to agricultural information and technologies, notably including education and literacy levels, transportation, fewer female extension agents, limited ownership of land and resources for inputs among women, and cultural factors (Abi-Ghanem et al., 2013; Chizari, Lindner, & Bashardoost, 1997; Colverson, 1995; Kemirembe, Brewer, & Krueger, 2007).

From a global perspective, two-thirds of livestock keepers are women (Thornton et al., 2003). Likewise, women in Afghanistan are major contributors to household income and nutrition and are often involved in agricultural production, including livestock management (NAPWA, 2007). Historically however, Afghan women have had limited access to agricultural inputs, including access to information through extension services (Wilcox et al., 2015). Beyond gender-specific cultural and security constraints, women’s access to extension services in Afghanistan is further hindered by significant challenges incumbering extension service delivery to all farmers, including limited resources, low technical capacity among extension personnel, and political and physical insecurity in the country (Byce et al., 2016). The USAID-funded Afghanistan Agricultural Extension Project (AAEPII), implemented by a consortium of U.S Universities and led by the University of California-Davis, aimed to build technical capacity among Afghanistan’s Ministry of Agriculture, Irrigation, and Livestock (MAIL) offices and personnel, in order to improve farmer access to quality information necessary to improve agricultural production in rural Afghanistan.

Purpose and Objectives
This study was initiated prior to the project’s launch of a Dairy Farmer Field School program in order to collect program baseline data and to inform program design and implementation. The study sought to identify plausible answers to these questions:

1. How are roles and decision-making authorities differentiated among family members on small-scale dairy farms?
2. What formal and informal agricultural advisory systems do women currently rely on for information related to dairy production and marketing?

Methods
The study utilized a descriptive-analytic questionnaire consisting of 35 closed-answer items and one open-ended item to collect primary data. The instrument was evaluated for cultural bias and local appropriateness by an Afghan co-investigator, translated to the most common local language, and administered orally due to low literacy rates among participants (Fink, 2003; Lietz, 2010). The target population for this study was female members of the Herat Dairy Union (estimated n=450), which is a private collective of small-scale dairy producers and processors in the western region of Afghanistan. A purposive sample of 329 respondents was selected based on their expressed interest in joining the project’s Farmer Field School effort (N=329). Closed-answer survey responses were analyzed using the statistical package for social sciences (SPSS) to summarize the data using descriptive statistics while data was analyzed for correlation between independent variable (such as age, household size, income, and location) and dependent variables (family roles and women’s access to information) using multivariate linear regression analysis (Ho, 2013).

Results
Respondents were from nine villages across three districts of Herat Province, Afghanistan. The mean reported age of respondents was 36.95 years, ranging from 17 to 62 years old. The mean household size reported was 3.46 with 89.66% of respondent reporting at least one child under the age of 5 in the household. Respondents reported a mean dairy herd size per household of 1.44 cows and an average land holding of less 1.77 jeribs (less than one acre).

Analysis of reported delineation of family roles across 11 key tasks associated with household milk production and marketing, indicated that women in the household are most typically responsible for tasks such as daily milking (96.81% of respondents), cooking with milk products (98.17% of respondents), and maintaining herd data and milking records (96.16% of respondents). 93.0% of female respondents indicated that women decide how income from milk production is utilized for the farm and household. Purchasing and selling dairy cattle and equipment, feeding and providing medical attention, cultivating feed and forage crops, and bringing products to the market are reportedly conducted by adult males. Regarding access to and use of formal and informal agricultural advisory services, 98.48% of women reported seeking advice from other women in the community, with private veterinarians being the second most commonly access source of information. Conversely, less than one percent of respondents reported accessing public extension advisory services provided by MAIL extension personnel.

Implications
With this clearer understanding of family roles in small-scale dairy production and marketing, extension practitioners in Afghanistan can better target their initiatives with a gender-responsive approach. Examples from the dairy industry in India suggest that understanding and strengthening formal and informal information systems and access for women contributes to significant increases in sector productivity and growth (Herath, 2007). While this study was rapidly implemented to inform program design, further study drawing from previous work such as Al-Rimawi’s (2002) study of women’s role in livestock production in Jordan, will yield a deeper understanding of the extent of women’s participation in various production and processing activities as well as the extent of women’s power in decision making related to dairy production and processing.
While many donor programs focus on building public capacity for extension and advisory services, this preliminary study highlights the importance of informal advisory systems, such as social networks among women, and private sector services, suggesting women rely very little on government-provided livestock extension services. While further study is recommended, this study strongly suggests that programs aimed at improving small-scale milk production in Afghanistan should diversify their mode of delivery and participants to both men and women while broadening collaborations beyond the public sector, to leverage informal and private-sector advisory and service systems.

References


Wilcox, C. S., Grutzmacher, S., Ramsing, R., Rockler, A., Balch, C., Safi, M., & Hanson, J.
The Phenomenon of Women’s Empowerment Projects Fostered by the INGO Field of Hope in Northern Uganda

Alexa M. Major
Field of Hope

Dr. M. Craig Edwards
Dr. Shida R. Henneberry, Ph.D.
Oklahoma State University

Dr. Joshua J. Ringer, Ph.D.
Langston University

Introduction

Women across the world continue to be marginalized. In Sub-Saharan Africa, women are more than 50% of the agricultural labor force, but only own approximately 20% of the land (FAO, 2014). Agricultural outputs of lesser-developed countries would rise from 2.5 to 4.0% if women had equal rights; this increase would result in 150 million fewer hungry people worldwide (USAID, 2015; World Economic Forum & FAO, 2013). The United Nations (2018) prioritized gender equality in its Sustainable Development Goals (2015-2030) and encouraged national governments and other actors, such as International Non-Governmental Organizations (INGOs), to do likewise. Many INGOs provide programs related to microfinance and cooperatives to improve the woman-farmer’s way of life (Lecoutere, 2017; Majurin, 2012; Otero, 1999; Selinger, 2008). For example, Field of Hope has implemented Village Savings and Loan Associations and hosted agricultural trainings for women farmers in northern Uganda. However, little research has been done to study the effectiveness of its projects.

Purpose/Objective

This phenomenological study (Moustakas, 1994) sought to describe the lived experiences of women who participated in empowerment projects provided by the INGO Field of Hope in northern Uganda.

Methods/Data Sources

The study’s theoretical perspective included both critical and feminist theories, with foundations in empowerment and the actions of persons “transcending the constraints placed on them” (Fay, as cited in Creswell & Poth, 2016). Twelve women farmers, i.e., beneficiaries of Field of Hope’s projects in northern Uganda, as suggested by key informants (Rogers, 2003), volunteered to participate in semi-structured interviews during August of 2017. Three women from four groups participating in the INGO’s program were interviewed. Eleven relied on a translator and interviewed in their native language; one woman requested to be interviewed in English. Following the interviews, responses were coded and analyzed to develop five themes and 10 subthemes.

Selected Results/Conclusions

Theme 1. Securing children’s futures through education. Participants expressed great concern for their children’s futures and the need to provide them with an education. Woman 7 explained that her biggest accomplishment was putting her children in school: “I have been able to pay my
children’s fees . . . when soya is good, I am going to sell it now, and I’m going to pay their tuitions, pay their fees.”

**Theme 2. Empowerment and improved livelihoods as a result of INGO participation.** Theme Two was supported by five subthemes: development of self-esteem; gender equity and inclusiveness; building community; economic empowerment; and improved agricultural practices. Each subtheme demonstrated women becoming more empowered (Osirim, 2001).

**Theme 3. Further aspirations for improved quality of life.** Theme Three encompassed two subthemes: need for greater income generation and need for additional agricultural inputs. Woman 1 explained: “She is saying, they highly need those things, like fertilizer, seeds, trainings, professional skills, and training for vocation[al] skills so they can also improve their lives.”

**Theme 4. Ongoing challenges.** Theme Four included three subthemes: burden and responsibility of paying school fees; climate and weather volatility; and access to and affordability of health care. Despite efforts of the women and the INGO, these challenges persist.

**Theme 5. Fear of abandonment by the INGO.** After two years in the INGO’s program, a sense of reliance on their services had formed. Participants feared the program’s projects would end. Woman 7 explained:

What I need most? Probably to encourage me and giving us the trainings. I was just saying I wish they would not leave us, they would continue with us, until they bring us out of the state we are in.

By coalescing the study’s themes, the phenomenon’s essence was revealed: *Women participants of projects fostered by the INGO Field of Hope in Uganda, although feeling empowered based on increased perceptions of self-esteem, gender equity, sense of community, agricultural knowledge, and economic improvement, still faced ongoing challenges and aspired to further improve their livelihoods.*

**Implications/Educational Importance/Recommendations**

This study contributes to the literature by giving voice (Cornwall & Edwards, 2010) to the beneficiaries of an INGO-sponsored empowerment program in Uganda. Its findings stand to inform the best practices and realistic goals of INGOs working on issues of women’s empowerment. INGOs should clearly communicate their strategic plans to beneficiaries and be transparent about expectations for the termination of projects. Additional research is needed to determine which INGO practices encourage empowerment over dependency (Rahman, 2006). Investigators should also examine whether empowerment projects increase women’s agricultural productivity and the economic impacts of such (O’Sullivan, Rao, Banerjee, Gulati, & Vinez 2014).

**References**


Experiential Service Learning and Reflection: What International Experiences Can Teach Us About How We Learn

Catherine E. Dobbins
University of Arkansas
Leslie D. Edgar
University of Georgia
Kim E. Dooley
Texas A&M University

Introduction and Theoretical Framework

Much experiential education research emphasizes the importance of reflection (Lutterman-Aguilar & Gingerich, 2002; Mintz & Hesser, 1996; Silcox, 1993; Welch, 1999). A gap exists, however, in research focusing on how reflection in international experiential education and service learning can help students understand their personal learning styles and can empower students to become lifelong learners. International service learning (ISL) experiences help students develop skills to navigate an increasingly globalized world, and the localized, engaged scholarship provided to students in ISL contributes to advanced academic and personal knowledge production (McCabe, 2001; Peterson, 2009).

Reflection is a mechanism for students to process experiences (Roberts & Edwards, 2016). Experiential international education requires reflection to fulfill the educational aspect of the learning experience. Experiential education and service-learning abroad programs naturally complement each other because both aim to empower students to become responsible global citizens (Lutterman-Aguilar & Gingerich, 2002). Assessing students’ reflections can determine whether students have developed the capacity to learn through reflection (Bourner, 2003). Reflective narrative analysis is an important tool for educators to understand the degree to which students were able to process their experiences into learning.

Learning is a major determinant of human development, and understanding how individuals learn is crucial to their personal and professional development (Kolb & Kolb, 2005). The four stages of Kolb’s Experiential Learning Theory, used to guide data analysis, are: (a) concrete experience (CE), (b) reflective observation (RO), (c) abstract conceptualization (AC), and (d) active experimentation (AE) (Kolb, 1984). Kolb identified four types of learners who correspond to various stages in the experiential learning cycle: assimilators, convergers, accommodators, and divergers (Kolb, 1981). Assimilators learn better through consideration of logical theories and represent learning stages of AC/RO. Convergers learn best through practical applications of concepts and theories. Accomodators learn through hands-on practices. Diversers learn through direct observation and collection of a variety of related information. Understanding learner types is crucial to empowering students to improve their personal pedagogy through critical reflection and become lifelong learners.

Purpose and Objectives

The purpose of this study was to determine how reflection in an international service-learning project could yield insights about ways of learning based on Kolb’s Experiential Learning Theory (1984). The research objectives were to describe searching questions and emergent
themes within the reflective narratives, to identify the stages of Kolb’s Experiential learning theories students demonstrated in their narratives, and to determine to what extent Kolb’s learner types can be identified through the narratives.

**Methods**
Four graduate students enrolled in the spring 2018 course, *Global Horticulture and Human Nutrition to Enhance Community Resilience and Food Security*, participated in an ISL to Timor-Leste. Students kept a reflective journal during the ISL, cataloging daily activities and associated reflections. Emergent themes were qualitatively analyzed in the reflective narratives through open and axial coding to create overarching themes for pre-travel and daily reflections (Merriam, 2009). Using Kolb’s Experiential Learning Theory, researchers identified stages of Kolb’s model in the student narratives and used these stages, in addition to searching questions present in narratives, to construct learner profiles for each student. After data analysis, the constructed profiles were disseminated to students to provide them with an understanding of their preferred ways of learning. The Intercultural Development Inventory (IDI) offered students a way to measure intercultural competence before and after the ISL. Reflections on this assessment provided insight to how students view their own cultural competency.

**Results**
Emerging themes from the data provide an overarching context for the student learning profiles. Four themes emerged from the pre-travel reflections: *excitement and anxiety*, *expanding global knowledge*, *helping the community*, and *learning from locals*. Five themes emerged from the daily reflections: *learning about international development*, *reverence for people and country*, *understanding of infrastructure challenges*, *comparing perceptions of community*, and *learning about poverty and malnutrition challenges*.

The four students demonstrated two of Kolb’s Learning Types in their crafted profiles: diverger and assimilator. Student 1 and 4 were diversers, and Student 2 and 3 were assimilators. The diverging learners expressed sentiments such as “Timor-Leste is becoming strong; it is in a good place. Children have hope” (RO; Student 1), and “It was inspiring to see the families working the land and gain a greater understanding of into the work Hiam Health is doing” (CE; Student 4). The assimilating learners expressed, “I realized in addition to university educated citizens, developing countries need a vocational workforce to improve services” (AC; Student 2) and “A harsh reality set in. Americans, for the most part, do not have to worry about where their next meal comes from. At least I don’t” (AC; Student 3).

The group profile of the IDI demonstrated a meaningful gap between perceived and actual orientation on the continuum. This indicates that students overestimated their intercultural competency, which students expressed in the narratives. The reflections expressed a variety of sentiments toward the IDI, but all students intended to use the ISL to improve their intercultural competency, mostly through interpersonal interactions in country.

**Recommendations and Educational Importance**
This study provides an innovative framework for using ISL experiences to investigate learner types and ways of learning. It is recommended that educators empower students to understand
how they learn to enable them to become reflective practitioners and lifelong learners (Bourner, 2003; Schön, 1983).

References


The Forms of Dissonance Experienced by U.S. University Agriculture Students During a Study Abroad to Nicaragua

Adam M. O’Malley
Richie Roberts
Kristin S. Stair
J. Joey Blackburn
Louisiana State University

Introduction/Theoretical Framework
As capital, labor, and culture become more globally integrated, it is critical to engage individuals in cross-cultural activities (Myers, 2006). One popular approach that U.S. universities use to facilitate such experiences is through study abroad programs (McCleod & Wainright, 2009). Evidence demonstrates that study abroad programs can transform students’ intercultural sensitivity, global knowledge, and views on agriculture (Roberts & Edwards, 2016; Strange & Gibson, 2017). To facilitate such transformations, however, requires designing experiences that challenge students’ existing values and worldviews – a concept known as dissonance (Kiely, 2004). Mezirow (1991) theorized that when individuals reflect critically on dissonance, it spurs a transformational learning (TL) process. However, knowledge on the types of dissonance that initiate TL in study abroad programs is insufficient. In spring 2018, nine agriculture students from Louisiana State University (LSU) traveled to Nicaragua for a one-week study abroad. To encourage TL, students were required to reflect on their experiences daily.

Purpose
Grounded in Mezirow’s (1991) transformational learning theory (TLT), this study sought to understand the multiple ways that LSU agriculture students experienced dissonance during a study abroad program to Nicaragua.

Methodology/Data Sources
In this study, we used Stake’s (1995) instrumental case study approach. Lincoln’s and Guba’s (1985) standards for rigor – dependability, confirmability, credibility, and transferability – were also embedded in its design to ensure qualitative quality. To investigate the phenomenon, we analyzed participants’ daily video reflections captured using the smart-phone application ReCap®. To achieve a purposeful sample (Patton, 2002), we selected students (n = 5) who submitted a minimum of eight reflections. We then transcribed the reflections verbatim. To make sense of the data, we used Corbin’s and Strauss’ (2015) constant comparative method to facilitate three coding procedures: (1) open, (2) axial, and (3) theoretical. Through continuous analysis and data reduction, findings emerged.

Findings
Findings were narrated through three themes: (1) environmental, (2) sociocultural, and (3) personal that represented the various forms of dissonance experienced by participants.

Environmental
Upon arrival in Nicaragua, students immediately began to notice environmental differences. These discrepancies appeared to challenge students’ views on concepts such as sustainability and agriculture, resulting in some students feeling uncomfortable. One student shared: “I kind of felt
a little uncomfortable when I saw all the trash on the side of the road. I was like, “Oh, no, people, please pick up the trash.” It kind of made me sad. . .” Other participants explained they were surprised by differences in “climate” and “geography” and the resulting agricultural practices employed by farmers.

**Sociocultural**

As students were immersed in Nicaraguan life, *sociocultural* factors encouraged them to question their existing assumptions. For example, they articulated differences in the country’s customs, traditions, and other norms. One student shared, “. . . I was just a little taken aback by just how much poverty there is [in Nicaragua].” Observing such differences also appeared to help students understand *power, privilege, and position* in new ways. As an illustration, one student shared, “[In Nicaragua]. . . there is still this huge gap between men and women... it’s something [I had ] to adjust to.”

**Personal**

The final theme reflected the *personal* forms of dissonance experienced by students. Personal dissonance referred to the conflicts that students encountered in regard to their lifestyle, self-concept, and direction for the future. For instance, one student explained that through her experience in Nicaragua she began to reexamine her relationship with technology. She explained: “I’m really noticing. . . how dependent I am on my phone. I am constantly checking it, even though I know that I don’t have a connection. It’s kind of hard to get used to. . .” Other students began to recognize their privilege more fully and reconsider their life course. One student shared: “I don’t know, this trip really has given me a lot of food for thought, and a lot of direction in planning where I think I need to be going [in the future]."

**Conclusions/Implication/Education Importance**

By viewing this study’s findings through Mezirow’s (1991) TLT, three forms of dissonance emerged. The forms of dissonance appear to have intersected and influenced the ways in which students experienced TL, which led to actionable perspective changes. Findings from this study, therefore, support existing evidence (Kiely, 2004; Roberts & Edwards, 2016), but also add new dimensions to designing TL experiences. We recommend that practitioners consider the forms of dissonance identified in this study to *design, deliver, and promote* study abroad programs that facilitate powerful TL experiences.

**References**


Myers, J. P. (2010). To benefit the world by whatever means possible: Constructed meanings for


Using International Experiences to Drive Innovation in Extension Agent Program Development

Elizabeth A. Felter
Caroline R. Warwick
Tracy A. Irani
Timur M. Momol
University of Florida

Introduction
Extension around the United States has responded to the increasing interest in the food systems movement by trying to take a more active role in bringing together agriculture, public health, and food policy to expand the access and availability of healthier foods (USDA, 2013). As a result, there is a need for change in terms of developing new interdisciplinary approaches to Extension education, as well as to identifying relevant professional development opportunities for Extension professionals who want to engage in foods systems work. The traditional way in which Extension educators develop new programs and become members of programmatically focused teams has been through professional development. Professional development within Extension is usually conducted via the classic face-to-face in-service training, as well as online trainings, webinars, and videos (Sondgerath, 2016; Swann, Branson, Talbert, 2003). Professional development within Extension also incorporates experiential learning, however, this is no novelty. In fact, Torock (2009) has claimed that cooperative Extension vows to educate through experience. However, experiential learning is available through some programs such as 4-H program (Enfield, Schmitt-McQuitty, & Smith, 2007), but has not been adopted as a common practice in other programs, including programs that strive to educate the adults about the food system. A review of the literature has shown no empirical studies that examined the impact of using experiential learning strategies for teaching adults about local and international food systems or its impact on professional development.

Purpose and Objectives
The purpose of this study was to understand the impact of an international experience on Extension program development. The following objectives guided this study, (a) determine how program participants defined the terms “food system” and “local food” (b) identify participants’ intent to adopt aspects of their international experience into their educational programs.

Methods
This international educational program was comprised of a ten-day trip through Belgium, Germany, and the Netherlands, and attended by 20 program participants. Researchers of this study used focus group methods to collect qualitative data. A focus group is a series of discussions aimed to “obtain perceptions on a defined area of interest in a permissive, nonthreatening environment” (Krueger & Casey, 2014, p. 2). Focus group methodology is preferred when interviewees are similar and cooperative with each other, and when their discussion can generate the best information (Krueger & Casey, 2014; Stewart & Shamdasani, 1990). In this study, purposive sampling techniques were utilized. Participants were trip
attendees from a U.S. based state Extension service in a large southeastern state, including nine county Extension agents and state specialists, and eight non-Extension general consumers.

Results
Focus groups were audio recorded and transcribed verbatim. Themes were identified through the constant comparative analysis method, in which, as themes and sub-themes were identified, categories of themes were created, and new data was compared to existing categories to determine if they were similar or part of a new category (Glaser, 1965). Participants were asked specific questions about the trip’s impact on their educational programming, changes in perceptions of food systems and water resource management, and future plants following the trip. During the focus groups, participants mentioned the trip as a “valuable tool,” “educational,” and “impactful.” When asked about the trips’ specific impact on their ability to communicate about food systems, water and precision agriculture, participants mentioned they would be “far more confident,” would feel more comfortable “talking to their neighbors and informing them of [water policy, regulations],” and that they “had a little bit more to say to people.” When it came to developing programming, participants mentioned, “[Seeing other growing methods] is a tool I am going to use back in my program.”

Conclusions and Recommendations
Using international experiences as a professional development tool for Extension agent development has been shown valuable, as indicated by the findings. International experiences not only provide participants with an outside view of agricultural issues, but also inspire new ideas and educational methods. Programmatic innovations, including international professional development experiences focused in specific subject areas, may drive change in program development and serve as a valuable training tool for Extension agents nationwide. By incorporating a more wholistic view of food systems and resource management issues, Extension agents may be able to better connect with a wider variety of clientele. Follow-up studies should be conducted to see long-term impacts of international experiences on Extension agents.

References

A Content Analysis of International Agriculture Experiential Learning Modules

Carrie Baker  
Lindsey R. Coleman  
Gary Briers  
Texas A&M University

Introduction

International experiences have the potential to significantly impact the lives of students (Kuh, 2008). However, many students are unable to study abroad. As a potential solution, three universities partnered on a project allowing graduate students to travel to Gressier, Haiti, and share their stories with future international development students via Experiential Learning Modules (ELMs). ELMs are multimedia presentations based on the four adaptive modes of Kolb’s Learning Cycle (1984). The goal of these modules was for students to communicate problems surrounding food insecurity and human suffering, while simultaneously allowing the distance learner to have a vicarious international experience. This study seeks to understand the message these ELMs are sending, and the extent to which they might contribute to learning.

Purposes

Through the ELMs, the authors had unique opportunities to communicate experiences through stories, allowing audiences to share in those experiences. Storytelling can be used as a learning tool to help others make sense of the world (Amenumey, 2009). The purposes of this study were to describe the content of the ELMs systematically and to evaluate if the ELMs achieve the goal of accurately portraying international agricultural development activities, events, problems, and/or experiences for learners.

Methods

To achieve these purposes, a qualitative content analysis was performed. A content analysis is defined by Holsti (1969) as “any technique for making inferences by objectively and systematically identifying specified characteristics of messages” (p. 14). Further, content analysis is a research method for “analyzing written, verbal, or visual communication messages” (Cole, 1988 p. 1). This systematic method allowed the multimedia content in the ELMs to be analyzed together as one single message. This method also allows inferences and conclusions to be made as a result of the analysis. An outside researcher, unrelated to the production of the ELMs, objectively reviewed 23 ELMs, analyzed the content, and documented their observations. These systematic observations were then reviewed and analyzed thematically.

Results

From the analysis, the researchers/analysts were able to comprehend the overarching themes related to food insecurity and human suffering. The analysts noted that although many different messages were portrayed in the ELMs, the aesthetic of the ELMs was the same. Because all modules were similar in design, it detracted from the unique message and experience of each student. Additionally, many of the slides were too text dense for the allotted time given to read. This hindered the learning experience. The researchers observed that the information provided in the ELMs was broad or surface level, and neglects to communicate contextual information that would further contribute to the experiential component of the modules. Structured around Kolb’s
(1984) Learning Model, each ELM notes the concrete experience, reflective observation, abstract conceptualization, and active experimentation the student creator experienced related to their topic. While this is a logical framework for the creator, due to lack of immersion, the audience is not able to experience that cycle in the same way. The most immersive part of the ELMs was video content filmed from the point of view of the graduate student. Through these videos, the learner/viewer is able to virtually enter into the Haitian environment. From this initial evaluation of the ELMs, the researchers concluded that in their current format, the ELMs do not create a rich and powerful vicarious international experience for learners.

**Recommendations**

To create a more immersive experience, the format of the ELMs needs to engage the classroom learner more effectively. We recommend incorporating more multimedia content. Additionally, we suggest that interactive components, e.g., clickable content, virtual tours, and review sessions, be added. Involving the audience more extensively throughout the learning process will enhance their experience. Further, narration should be rerecorded with more emotion. This would aid in story development and help elicit similar emotions from the classroom learner. Along with more emotion, the narratives could communicate the experiences in greater detail. This could be achieved with more specific information and higher-quality visuals of Haiti. Finally, we recommend the ELMs contain an explanation of the importance of each ELM in the Haitian context. The ELM should contain a reflective piece from the author about their experience, as well as reflection for the learner. Research suggests that reflection alone is a vicarious experience (Roberts, 2009), allowing the learner to add value and make meaning from their experience with the ELM. For future evaluation of ELMs, researchers should collect observations from learners/audience members, allowing for inclusion of more perspectives.

**References**


Exploring the Impacts of an International Field Experience on the Social Capital of University Faculty

T. Grady Roberts
Amy Harder
University of Florida
James R. Lindner
Auburn University
Kim E. Dooley
Robert Strong
Texas A&M University
Lisa Lundy
University of Florida
Christopher T. Stripling
University of Tennessee
Nicole L. P. Stedman
University of Florida

Introduction
Building human capacity is a recurring theme in international agricultural and extension education. University faculty play an important role in building other people’s capacity through their teaching, extension/outreach, and research activities. Faculty effectiveness, however, is often contingent on their own social capital. Social capital has been linked to faculty success, especially for younger faculty (Boice, 2000).

This research was framed using Putnam’s social capital theory (Putnam, 2000). Social capital refers to the connections an individual has with other people. Putnam proposed individuals can possess two types of social capital: (a) bridging and (b) bonding. Woolcock and Narayan (2000) added a third, linking social capital. Bridging social capital occurs when individuals have connections with people different than themselves (Putnam, 2000). Bonding social capital occurs when individuals have connections with people similar to themselves (Putnam, 2000). Linking social capital occurs when people build connections across different hierarchical levels of a social system (Woolcock & Narayan, 2000).

Social capital has previously been studied with a variety of audiences in international agricultural and extension education, such as university faculty in Haiti (Albert, Roberts, & Harder, 2018) and farmers in Morocco (Rasmussen, Pardello, Vreyens, Chazdon, Teng, & Liepold, 2017). The potential for an international field experience to develop social capital of U.S. faculty has not been reported in the literature. This study will start to fill that gap.

Purpose
The purpose of this study was to explore the outcomes of a faculty development program consisting of an international field experience on the social capital of faculty.

Methodology
In 2016, an international faculty development program was designed to help faculty learn to explicitly teach critical thinking in their classes by using scenarios focused on food security and climate change in a developing country. The international field experience was designed to provide faculty with direct experience examining climate change and food security in Belize. This field experience occurred in March 2017 over an eight-day period and involved a series of visits to agricultural, cultural, and environmental sites. At total of fourteen faculty from eight universities across the Southern U.S. participated. Faculty spent most days interacting with each other on project goals and socially. Researchers interviewed each faculty participant four times over the experience, using a semi-structured interview guide focused on their reactions to specific experiences, communication choices, and relevance to their professional work. Those interviews were transcribed verbatim and shared with participants for their feedback as required for member checking (Lincoln & Guba, 1985). Initial data analysis used structural coding (Saldaña, 2013) to categorize data using the social capital framework. Then, pattern coding (Saldaña, 2013) was used to organize data within each dimension of social capital.

**Results**

**Bonding Social Capital**
Participants expressed gains in bonding social capital. This was by building connections with peers at the same institution whom they had not previously known.

**Bridging Social Capital**
Participants conveyed changes in bridging social capital. First by building relationships with peers in different disciplines, especially between the natural and social scientists. Then by making connections with peers at other universities who had similar technical expertise as themselves. The third was the connections made with professionals in Belize with whom participants saw opportunities for continued interactions. As an example, a participant said “I don’t want to hear the same thing over and over from the same people in the same discipline, so this has been huge and eye-opening.”

**Linking Social Capital**
Linking social capital was also displayed. Participants shared about the connections they made with farmers and other ordinary people through their interactions.

**Conclusions, Recommendations, and Implications**
Faculty participants expressed positive changes in bonding, bridging, and linking social capital as a result of the international field experience, and these changes should have a positive impact on faculty success (Boice, 2000). Although developing social capital was not an explicit goal of the larger project, it appears to be a tangible outcome from the field experience. Future experiences should more explicitly focus on this outcome by providing semi-structured opportunities for continued interactions after the international field experience. The results of this research highlight faculty perceptions *during* the international experience, as interpreted by the researchers. Additional research should follow up with faculty participants to explore how these relationships evolved *after* the experience and how they perceived these relationships. Intentional social capital development experiences may increase the impact of faculty’s teaching, extension/outreach, and research activities. Future research is warrant to explore this possible impact.

**References**


Teacher Perception of Students’ Extension Competency Within Post-Secondary Agricultural TVET Schools in the West Department of Haiti

Gangseok Hur
M. Christelle Calixte
J.C. Bunch
T. Grady Roberts
University of Florida

Introduction
Agriculture plays a dominant role in the Haitian economy, contributing over 25 percent of GDP and around 50 percent of overall employment (The World Bank, 2017). However, Haiti could not produce enough food, and imports more than 50 percent of its population’s needs (World Food Programme, n.d.). In terms of agricultural development, the role of the extension service is pivotal (Sulaiman & Davis, 2012; Suvedi & Kaplowitz, 2016). The success of agricultural extension services is dependent on extension professionals’ competency to perform their extension work effectively (Ghimire, Suvedi, Kaplowitz, & Richardson, 2017).

The postsecondary agriculture institutions in Haiti educate the future workforce who will assist to meet the developmental needs of the agriculture sector (Pierre, Calixte, Moore, Bunch, Koenig, Delva, & Roberts, 2018). Along with universities, Agricultural Technical and Vocational Education and Training (TVET) schools in Haiti provide individuals with education and training to enter the agricultural sector. Thus, the exploration of how extension competencies are addressed in TVET schools is needed to ensure students are prepared for employment as extension professionals.

Purpose and Objectives
The purpose of this study was to explore how extension competencies are addressed in Haiti’s agriculture TVET schools. The objectives of this study were to: (a) describe teacher opinions about the importance of extension competency areas, (b) describe teacher opinions about the degree schools provide extension competencies, (c) describe teacher opinions about the responsibility of their institution to teach extension competency areas, and (d) describe teacher opinions about student mastery of competency areas upon graduation.

Methodology
This study utilized survey design. The population investigated was agriculture TVET school teachers and directors in Haiti. The accessible sample was teachers and directors at four TVET schools in the Ouest Department of Haiti \( n = 16 \). The school director and three teachers at each school were surveyed.

The instrument utilized in this research was developed by Albert, Roberts, and Harder (2017) based on Sulaiman and Davis’ (2012) core competencies for individuals in rural advisory services. The instrument consisted of four questions about extension competency areas as follows: (a) Rate how important you think it is for your students to gain competency in this area so that they will be successful in their future employment, (b) To what degree does your institution teach this competency? (c) Is it your institution's job to help students develop this
competency area, and (d) To what level do students possess competency in this area when they leave your institution.

**Results**
The first objective of the research was to describe teacher opinions about the importance of extension competency areas. The highest ranked competency areas of perceived importance were: (a) agricultural entrepreneurship, (b) professional ethics, (c) communication. The lowest ranking competency areas were: (a) adult learning and (b) program implementation.

The second objective of the research was to describe teacher opinions about the degree that each extension competency was taught, with a higher percentage in ‘as a whole course’ indicating greater the degree of education schools provided of extension competency areas. The highest ranked competency areas were (a) agricultural systems, (b) communication, and (c) professional ethics. The lowest ranked competency areas were (a) behavior change, and (b) critical thinking.

The third objective of the research was to describe teacher opinions about the responsibility of their institution to teach extension competency areas (Yes/No). The highest ranked competency areas relevant to responsibility of institutions to teach the competency were (a) agricultural entrepreneurship, and (b) behavior change. The lowest ranked competency areas from lowest to highest were (a) adult learning, and (b) youth issues in agriculture.

The fourth objective of the research was to describe teacher opinions about student mastery of competency areas upon graduation. The highest ranked competency areas relevant to student mastery of the competency area were: (a) agricultural entrepreneurship, and (b) program monitoring and evaluation. The lowest ranked competency areas were (a) adult learning, and (b) program planning.

**Conclusion, Implications, and Recommendations**
These results show that agricultural entrepreneurship and agricultural systems seem to be addressed best in the schools. Adult learning, critical thinking, and program implementation were addressed the least. Among these competency areas, adult learning was consistently ranked as the lowest for all objectives supporting Albert et al.’s (2017) findings. Extension professionals work mainly with adults. Thus, extension students should be competent in adult education principles upon their graduation (Suvedi & Kaplowitz, 2016).

**References**


Empowering Local Leaders to Teach: A Case Study on Haitian Vocational Agricultural Students’ Teaching Self-Efficacy

Shannon Norris
Lindsey Coleman
Gary Briers
Manuel Piña
Texas A&M University
Rebecca Robles-Piña
Sam Houston State University

Introduction/Theoretical Framework
International agricultural extension education plays a vital role in community and rural development (Swanson & Davis, 2014). As the agricultural industry serves more than half a billion people in rural regions of the world (Davis, 2016), working to improve access to agricultural and extension education in various international settings remains a key mission (AIAEE, 2018). Davis and Sulaiman (2014) suggested one step to ensuring extension’s global capacity is maintaining efficient, effective, and sustainable services that are relevant to each country’s needs. Engaging and empowering local knowledge and leaders within international locations could serve as a vital link to developing sustainable extension programs (Beckford & Barker, 2007; Rogers, 2003).

To target key areas of global agricultural need, the Food and Agriculture Organization (FAO) highlighted the strategic importance of improving agricultural education in the Caribbean and Latin America (FAO, 2018; Ganpat, Harder, & Moore, 2014). Of drastic need was Haiti—the poorest country in the Western Hemisphere—where more than one half of the population lives below the poverty line (Labrador, 2018). In an effort to address an unskilled labor force in Haiti, the Christianville Ecole Technique (CVET) school began in 2014 and specialized in degrees for vocational agriculture, mechanics, and culinary arts (CVET, 2018). To equip CVET students with the teaching tools and confidence to apply their vocational education, students from Texas A&M University and Auburn University hosted a five-day workshop to empower CVET students to serve as agricultural educators and extension liaisons in their local communities. To understand CVET students’ self-efficacy toward teaching agricultural education, we used Bandura’s (1989) social cognitive theory to guide our study.

Purpose and Objectives
The purpose was to understand participants’ belief(s) in their ability to teach agricultural education to local residents. The following objectives guided this study:
1. Describe participants’ belief(s) in their ability to teach local residents agricultural education techniques and practices in rural Haiti.
2. Describe participants’ reflections from the five-day, agricultural education teaching techniques workshop.

Methodology
Researchers used a qualitative, case study approach to understand participants’ (n = 14) perceptions of their ability to teach agricultural education practices to Haitian farmers and
residents. Data were collected using participant observations and semi-structured interviews (Yin, 2018) after participants engaged in a five-day, agricultural education teaching techniques workshop hosted by Texas A&M University and Auburn University in March 2018. The purposive sample included former CVET students who had vocational agricultural education backgrounds and who were interested in applying their knowledge in community extension seminars. Interviews were orally-translated and field notes were recorded in English. Participation in the interview was voluntary. Researchers used axial coding to identify emergent themes (Merriam & Tisdell, 2016).

Findings
Three key themes emerged that contributed to improving students’ teaching self-efficacy. Anecdotal statements were used to support the themes. First, participants felt empowered to teach local Haitians techniques they learned in CVET and during the teaching workshop. Specifically, H01 said, “… we might not know everything, but we can teach something… we now know we can use small things to make a difference.” The second theme that emerged was motivation to continue learning. H06 said, “The only way to change Haiti is to share what you know.” The third theme was pride and hope for Haiti. Even though respondents discussed several challenges Haitians face (unemployed workforce, low income, political revolutions, low reading level, dependency on international aid), they were proud to be from Haiti where they can “make a difference” (H05, H12, H14). Respondents indicated they were determined to continue sharing their pride for Haiti by teaching agricultural education in their communities.

Recommendations and Application
Empowering local leadership remains a challenge and key focus for CVET students and Texas A&M University and Auburn University. One component of establishing effective international extension programs is empowering local leaders to implement teaching techniques. Just as Beckford and Barker (2007) argued, engaging local knowledge serves as a lynchpin to helping develop sustainable extension programs. Therefore, we recommend further investigating ways to capitalize on local knowledge to engage and empower local leadership in international settings to adopt change (Rogers, 2003). Respondents highlighted their motivation for furthering their education to serve their communities, which supplements Bandura’s (1989) social cognitive framework of learning from multiple platforms to build their self-efficacy. To address this need, we recommend applying teaching techniques with specific application examples in future workshops. Finally, one limitation to case studies is investigating small, specific samples, which could be prone to selection and observation biases (Yin, 2018). Consequently, we recommend investigating the influence of empowering local leaders from different populations to teach.

References


Student Perception Towards a Distance Based Agricultural Education Program in Uganda: The Case of the Bachelor of Agricultural and Rural Innovation-External, Makerere University

Kyazze Florence Birungi
Makerere University
Mercy Akeredolu
Sasakawa African Fund for Extension Education
Rebecca Mukebezi
Gabriel Karubanga
Makerere University

Introduction
Knowledge and human skills development are essential ingredients for resilient agricultural systems that will meet the food and income needs of their present and future generations. The challenges of building vibrant and resilient farming systems however, are multifaceted and requires significant investment in higher agricultural education and a transformation in the way universities train their students. Distance education is one of the innovative approach through which universities can enhance agricultural competences to the masses with efficiency and cost effectiveness. To this effect, Makerere University developed a Bachelor of Agricultural and Rural Innovation-External (BAX) degree program to impart innovativeness, problem-solving, and entrepreneurial competences to midcareer extension professionals through a distance based mode. The mode of study further offered an attractive option to those learners who preferred a more flexible learning environment to balance competing socio-economic and job related commitments (Butcher & Rose-Adams, 2015; Schuetze & Slowey, 2002). Though BAX made the acquisition of education affordable regardless of time and space since 2012, no empirical evidence exists to describe the student perception towards the structural and organizational context in which the program is implemented as well as its ability to deliver quality education to its diverse learner audiences.

Purpose and Objectives
The study described the perceptions of students towards the structural and organizational context of distance based mode of study for the BAX program in Makerere University. The study specifically; (i) described the social-cultural and institutional context in which the BAX program is implemented; (ii) identified the student perception towards the quality of skills and knowledge imparted through the BAX program and how these were informed by teacher behavior.

Methodology
This descriptive study targeted agricultural professionals enrolled on the BAX program since 2012 (n=52). The respondents were identified through the list of students that that participated on the BAX degree program in the Department of Extension and Innovation Studies. A self-administered questionnaire was used to elicit for information on diverse perpetual dimensions of the BAX program that informed its structural and organizational context as well as its relevance and adequacy in terms of knowledge and skills imparted to enhance agricultural professionalism. A split-half reliability test was conducted to test the reliability of the questionnaire.
Results and Conclusions

Students enrolled in BAX program had diverse range of social and cultural background in terms of sex, age, previous education status and marital status. The BAX was housed in the College of Education and External Studies and the College of Agricultural and Environmental Studies for routine administration and technical support respectively. Within this structure and organization arrangement, knowledge and skill was imparted to the students through face to face sessions and self-directed learning. Though this was true, many features of the traditional lecture teaching predominantly appeared in the BAX program implying that instructors did not fully internalize how to conduct a distance based teaching program. Likewise, the BAX students expected to be instructed in the same way as is done in a traditional classroom for full-time students. The failure for instructors and students to conceptualize the distance mode of study of BAX made it difficult for both parties to appreciate that both skill and knowledge can effectively be imparted through this mode. This frustrated students who in turn believed that they were undermined and marginalized.

Further, Makerere lacked adequate structures to facilitate close interaction between instructors and students over the period when they were off-campus. Lack of proper student follow up and feedback between instructors and students impeded a sustainable professional bond between students and instructors. While some scholars (Jelfs, Richardson & Price, 2009; Kearns, 2012) noted the importance of the special attention that instructors owed to the independent learners, this was missing in the BAX program. This was further aggravated by the negative teacher behaviour characterized by tardiness, absenteeism and unwillingness to participate on the program.

Recommendation

Makerere should revise its structural and organizational context to enable the students recognize themselves as privileged students with a sense of belonging to their professional environment. Further, effective implementation of BAX calls for a comprehensive instructor orientation on the basic features of a distance mode of study and how this can used to deliver quality education. This in turn will build strong instructor and student relationships and mold a positive teacher behaviour that appreciates distance learners. The instructor should also tap into the existing information technology infrastructure to support active student learning and continued information exchange.

References


**Evaluating Research for Development: A Framework to Assess the Impact of a Feed the Future Innovation Lab**  
Sebastian Galindo  
Brigitte A. Pfluger  
University of Florida  
Marjatta Eilitta  
Southern Africa CNFA

**Introduction**

*Feed the Future* (FtF) is a U.S. Government’s initiative created to “reduce global hunger, undernutrition and extreme poverty” (FtF, n.d., p.6). The results and contributions of this initiative, managed by the U.S. Agency for International Development (USAID), led to the enactment of the Global Food Security Act (GFSA) of 2016 and the creation of the Global Food Security (GFS) Research Strategy to support the goals of the GFSA (FtF, n.d.). The GFS Research Strategy supports promotes the generation of scalable food security innovations and practices and the development of human and institutional capacity of the developing-country beneficiaries.

Several U.S. universities participate in this process serving as management entities of FtF Innovation Labs; these are specialized hubs responsible for implementing the FtF initiative. The diverse disciplinary and geographical foci of the Innovation Labs make their monitoring and evaluation (M&E) challenging. USAID has developed a sound framework of indicators (FtF, 2018) to standardize M&E across the FtF program. However, given the inherent challenges associated with evaluating mid- and long-term outcomes within such a large and diverse system, most of the FtF indicators focus on outputs rather than outcomes.

An Innovation Lab has developed an Evaluation Framework to take a more in-depth look into potential outcomes and enhance its research-for-development learning process; this application submission documents the experience, which is still a work in progress.

**Purpose and Objectives**

While the Lab’s FtF indicators are mainly focused on results at the output level, the framework was developed to support evaluation efforts aimed at assessing the implementation progress, identifying roadblocks to achieving outcome and impact level results, and drawing lessons on the processes of research and capacity building.

**Theoretical/philosophical Themes**

The development of the framework and its associated tools was informed by Rogers’ diffusion of innovations theory (2003). Specifically, the four main elements of diffusion (i.e., the actual innovation, the communication channels, the social system, and the effect of time) and the five attributes of innovations (i.e., relative advantage, compatibility, complexity, trialability, and observability) were fundamental for the conceptualization and creation of the framework and tools.
Within a participatory approach to evaluation (Fetterman, Kaftarian, & Wandersman, 2015), the development of the framework was further informed by key evaluation concepts related to its utilization (NSF, 2002; Patton, 2008), its adaptability (Patton, 2010), and its forms (Owen, 2007; Rossi, Lipsey, & Freeman, 2004; Wholey, Hatry, & Newcomer, 2004). Furthermore, the evaluation standards grouped under utility, feasibility, propriety, and accuracy (Yarbrough, Shulha, Hopson, & Caruthers, 2011) guided the development process.

**Products and Conclusions**

The framework consists of a three-step program evaluation process that is applied across all projects funded by the Lab in its target countries. The three steps are:

The *Innovation Evaluation* step investigates the research for development process of every project by assessing the relevance and characteristics of new or adapted innovations (i.e., technologies and practices).

The *Dissemination Studies* step examines the diffusion process by evaluating the scaling plans for the innovations, determining if uptake of the research for development efforts has been initiated, or not, by organizations or institutions in the target countries, and identifying the characteristics of the social system and end-users facilitating or hindering this process.

The third and final step of the framework, *Impact Evaluation* investigates the impact of the adoption of the innovations at the local and institutional levels, as well as the potential effects on policies in the target countries.

Multiple data collection procedures and instruments have been created to support the implementation of this evaluation framework. Regional coordinators of the Lab have been trained in the utilization of these procedures and tools, and sub-awardees have received detailed guidelines and technical support to develop their own tools in alignment with the framework.

Step 1 is conducted during project implementation, Step 2 is conducted 6 months after the project conclusion, and Step 3 is conducted at least 18 months after the project’s conclusion. Given the ongoing funding cycles of the Lab, and the newness of this framework, Step 1 has been implemented, in different degrees, in every project funded by the Lab. The implementation of Step 2 is starting during the fall of 2018 for select projects that concluded early in this year, while Step 3 is planned to begin in the spring of 2020.

Multiple relevant lessons have emerged from Step 1. As the implementation of the framework progresses, the Lab expects to fine-tune the three steps and create a product that can be adopted by other Innovation Labs, with minimal adaptations.

**References**


Feed the Future. (n.d.). *The U.S. government’s global food security research strategy*. Retrieved from
Cognitive, Metacognitive, and Motivational Perspectives from Preflection and Post Reflection After a Service Learning Experience in Timor-Leste

Kim E. Dooley
Texas A&M University
Catherine Dobbins
University of Arkansas
Leslie D. Edgar
University of Georgia

Introduction and Theoretical Framework

In spring 2018, an interdisciplinary online course was developed on the Nexus of Global Horticulture and Human Nutrition to Enhance Community Resilience and Food Security. Graduate students enrolled in this course applied for an international service-learning opportunity to enrich cognitive, metacognitive, and motivational perspectives.

The theoretical framework integrates self-regulated learning in two reflective phases: preflection regarding future learning perspectives and post-reflection after the experience. Other researchers in the profession have used preflection and post-reflection (Gouldthorpe, Harder, Stedman, & Roberts, 2012; Rutherford, 2012) but constructivism adds further theoretical triangulation. Graduate students engaged in international service-learning are self-regulated learners, both influencing and adjusting learning in the cognitive, metacognitive, and motivational dimensions (Bransford, Brown, & Cocking, 2000). Cognitive dimension includes domain-specific knowledge, strategic knowledge, and information processing. Metacognitive dimension includes knowledge of their cognition, task knowledge, planning, monitoring, and evaluation. Motivational dimension includes interests, beliefs, and affective processes (Boekaerts, 1995; Ifenthaler & Lehmann, 2012). Self-regulation is influenced by task complexity, context, and individual characteristics, leading to varying decisions and learning outcomes (Schmitz, Landmann, & Perels, 2007 as cited by Lehmann, Hähnlein, & Ifenthaler, 2014).

Purpose

The purpose of this study was to determine the cognitive, metacognitive, and motivational perspectives using preflection and post-reflection about a service-learning experience in Timor-Leste.

Methods

A census sample of graduate students received a pre-experience reflection prior to the service-learning trip. “Preflection is a process of being consciously aware of the expectations associated with the learning experience…it increases the readiness capacity of students to learn from their experiences, thereby increasing their capacity to reflect upon the concrete experience and increasing the overall learning. Preflection provides a bridge between thinking about an experience and learning from the experience” (Jones & Bjelland, 2004, p. 963). Graduate students were also given a post-experience reflection on the last day of the project. Reflection was defined as the “process by which an experience is brought into consideration, while it is happening or subsequently. It is the creation of meaning and conceptualization from the experience” (Gamble, Davey, & Chan, 1999, p. 2). The focus of this exercise was to describe
change in perspectives, such as attitudes and beliefs, barriers, opportunities, and expectations before and after the experience. Emergent themes were qualitatively analyzed using an open-coding technique and peer debriefing with two evaluation specialists.

**Results**

For cognitive perspectives, students wanted a “greater understanding of [their] role as future change agents/educators” and the ability to “develop research projects.” Originally, they expressed this as a lack of confidence, but afterwards, students stated that “this taught me that I have the skills and knowledge to overcome my barriers.” Before the service-learning opportunity, students wanted to “inquire and observe NGO practices…and how [they] relate to project development and success” and “gain additional project management skills” particularly in agricultural development projects. After the experience, students “validated the need for NGOs’ engagement to assist in project management” and “witnessed local NGOs and their capacity building.”

For metacognitive perspectives, students had some concern about not knowing the language and culture in the pre-reflection, but in post-reflection, described their experience of “hearing living culture (language and history, museums, historic sites, traveling together)…creating brain and emotional connections.” Another stated: “Not only did this experience allow me to learn about the Timorese culture, but I was able to become more rooted in my own culture.” In reflecting about the time and cost prior to the trip, a student questioned: “Would the cost for the program equal my work contribution? Should more nationals be in the positions rather than external experts?” Students mentioned they sought affirmation on whether international agriculture development was a career choice and later reflected they would like to return and be involved in longer-term projects.

For motivational perspectives, students were concerned about a “disjointed government” and “lack of municipal infrastructure,” and some with “political unrest” before the experience. In post-reflection, students found it was “relatively safe,” and “people were happy and peaceful after the election.” Students were excited about gaining professional experience and curious about Timorese culture in their pre-reflection. Afterwards, students indicated that this experience “boosted professional experience” and that the Timorese were “proud” and “resilient.”

**Recommendations and Educational Importance**

This study provides an innovative framework for analyzing pre- and post-reflective narratives to measure learning perspectives. It is recommended that agricultural and extension educators consider the cognitive, metacognitive, and motivational aspects of learning in self-regulated international settings. Creating interdisciplinary service-learning experiences enhances the preparedness of graduate students for professions in agricultural extension education working on complex global issues.

**References**


Farmers’ Use of Information Communication Technologies and Preferences for Digital Content in Trinidad

Lendel K. Narine
Utah State University Extension
Amy Harder
T. Grady Roberts
University of Florida

Introduction/Theoretical Framework
Extension should respond to farmers’ needs in a timely, effective, and efficient manner using innovative extension methods. However, Ministry Extension mainly used the farm visit approach to communicate with farmers (Ganpat, Narine, & Harder, 2017). Parker (2016) found farmers were only willing to use the Ministry Extension service if the information was delivered via their preferred medium. Farmers gave little attention to Ministry Extension since they received irregular visits from Extension officers. They stated the information needed to address their problems was time-sensitive, and irregular farm visits from Extension officers did not facilitate timely access to information (Parker, 2016).

Ruggiero (2000) indicated the availability of many communication technologies presents users with considerable media choices. The Uses and Gratification (U&G) theory (Katz, Blumler, & Gurevitch, 1974) guided this investigation into farmers’ preferences for modern Information Communication Technologies (ICTs) mediums and agricultural information. U&G posits human communication behavior is driven by people’s needs and desires (Katz et al., 1974). Bell (2015) noted the communication medium should be linked to the type of information needed by farmers. Further, a critical factor to the success of ICTs in agriculture is identifying the right mix of technologies (Food and Agricultural Organization [FAO], 2015).

Purpose
This study sought to explore Trinidadian farmers’ current use of modern ICTs and their most preferred mediums for accessing agricultural information. Objectives were to assess: (a) farmers’ current ICT use, (b) the reasons farmers used ICTs, and (c) farmers’ most preferred mediums for receiving agricultural content.

Methods
The target population of this descriptive study was crop farmers of Trinidad. The study was approved as exempt by the Institutional Review Board. Cross-sectional data were collected from a sample of 200 farmers \( (n = 200) \). A sampling frame was not created due to the unavailability of a reliable database on active farmers in Trinidad (Baksh, Ganpat, & Narine, 2015). Therefore, data was collected via a convenience sampling technique. The Tailored Design method was used to design the close-ended questionnaire (Dillman, Smith, & Christian, 2015). An expert panel with experience in questionnaire design and extension education checked for item and construct validity. Results were based on a descriptive analysis of the data. Results of this study may not be generalizable to the population of Trinidadian farmers due to the use of a convenience sampling technique.
Results

Results showed ~81% of farmers read text messages, 74% sent text messages, ~60% sent and received pictures and videos, and 56% used a smartphone communication application called WhatsApp. Farmers used these services mostly to communicate with family and friends. Accessing agricultural information and non-agricultural information were tied as the second ranked reasons for using ICT services. About 30% used text messaging and 44% used WhatsApp for agricultural information. Results indicated farmers were most interested in receiving information relating to controlling pest and diseases (97%), market prices (95%), prices of chemicals (95%), advice from an extension officer (93%), weather (93%), emergency assistance (93%), and new agricultural equipment (92%). Text messages, face-to-face interactions, and voice calls were most preferred medium for accessing agricultural information, followed by the Internet. Most farmers indicated they preferred face-to-face interactions to get advice from an extension officer (57%) and information on controlling pest and diseases (51%). In contrast, many farmers stated they preferred to receive weather information, dates of farmer training courses, market prices, and chemical prices via text messaging. About 50% indicated they preferred voice calls to get emergency assistance.

Conclusions/Recommendations/Implications

Ministry Extension services should reassess their methods of communicating with farmers. However, the traditional farm visit method is still an important approach to providing time-sensitive and problem-based advice to farmers. While farmers commonly used modern ICTs, it appears they appreciate the personalized face-to-face meetings with Extension officers. Results showed farmers used text messaging, multimedia messaging, and smartphone applications mainly to communicate with family and friends. This suggests two-way ICTs are contextually appropriate for communicating with Trinidadian farmers on a regular basis. It is recommended Ministry Extension adopts new communication channels to communicate with farmers. As described by Bell (2015), Extension should match the type of information preferred by farmers to an appropriate ICT platform. ICTs can be effective in easing the burden of Extension officers to meet the demands of many farmers. It is critical for appropriate policies to encourage Extension officers’ use of a combination of technologies to meet the diverse needs of farmers. Future research is needed to understand the Extension’s willingness to use ICTs as a formal method of communicating with farmers.

References


Information and Communication Technology (ICT) Proficiency among Extension Agents and its Impact on the Adoption of Cyber-Extension in Indonesia

Zulham Sirajuddin
Universitas Ichsan Gorontalo, Indonesia

Robert A Martin
Iowa State University

Introduction
The past decade has witnessed the rapid increase of global interest toward Information and Communication Technology (ICT) implementation in agricultural and rural development. Many benefits of ICT use in agriculture have been observed globally including the increase of farm productivity, access to global markets information, and effective communication among actors related to agricultural production across different regions (Maumbe, 2012). According to Lubis (2012), ICT implementation in Indonesian rural development was pioneered through several projects such as Microsoft Community Training and Learning Center initiated by Microsoft, Poor Farmers’ Income Improvement through Innovation (PFI3) with the Asian Development Bank, and Farmers’ Empowerment through Agricultural Technology and Information (FEATI). The recent nation-wide program related to ICT implementation was launched by the Ministry of Agriculture in 2013, namely Cyber-Extension (which can be accessed through cybex.pertanian.go.id).

Various efforts such as training and socialization have been made to increase the adoption of cyber-extension in Indonesia. Nonetheless, recent studies have shown that still a small number of extension agents show interest in using the Cyber-Extension system (Adriana 2015; Ardiansyah, Gitosaputro & Yanfika, 2014; and Helmy, Sumardjo, Purnaningsih & Tjitropranoto, 2013). Therefore, there is a present need to study the challenges in implementing cyber-extension especially by examining the extension agents’ readiness to practice cyber-extension. This will be an important stepping stone in successfully disseminating cyber-extension to and among extension agents.

Purpose and Objectives
This study sought to assess extension agents’ proficiency in using ICT and its impact on the adoption of Cyber-Extension. The objectives were: (1) to identify the extension agents’ current position in the stage of innovation-decision process of cyber-extension, and (2) to determine whether extension agents’ ICT proficiency predicts the adoption of Cyber-Extension.

Methods and Data Sources
This study employed a descriptive design. 372 extension agents across six regencies in Gorontalo province, Indonesia were invited to participate, where 221 respondents agreed to participate in the study. Personal interviews were conducted using a questionnaire. To determine the stages of innovation-decision process, the diffusion of innovation theory (Rogers, 1995) was used. The stages were modified according to a study conducted by Li (2004) and Taylor (2015) by adding the no knowledge stage into the model. The participants’ ICT proficiency was measured with self-efficacy theory (Bandura, 1977) designed with five-point unipolar Likert-type scale. ICT proficiency consisted of computer skills and internet competence. Descriptive analysis was used...
to present the distribution of participants in the stage of innovation-decision, and logistic regression analysis was employed to determine the impact of ICT proficiency to Cyber-Extension adoption.

**Results and Conclusions**

The majority of the respondents were female (n=118, 53.4%), had completed a degree in the university (n=135, 61.9%), and were within the age range of 40-49 years old (n=99, 44.8%). Most of the respondents had access to the Internet on smartphone (n=169, 76.5%) but had no cable Internet access at home (n=193, 87.7%) and at work (n=170, 77.6%).

The majority of the respondents (n=80, 36.4%) stated that they had heard about Cyber-Extension but had not used it and had no idea that they would use it or not (knowledge stage). A very small number of respondents (n=8, 3.6%) were in the confirmation stage of Cyber-Extension adoption, claiming that they had used Cyber-Extension long enough to understand and evaluate whether Cyber-Extension would be part of their extension activities.

On average, respondents had strong confidence in Internet competency (M=2.62, SD=1.00), followed by computer skills (M=2.31, SD=1.13). A logistic regression analysis was conducted to determine if a participant’s ICT proficiency predicted their adoption of Cyber-Extension. Two predictors (computer skills and Internet competence) were simultaneously used in the logistic regression model. These predictors contributed 16% of the variance in the adoption of Cyber-Extension ($R^2=.15$). The model showed that computer skills successfully predict the Cyber-Extension adoption, significant at .01 level. The odds ratio of computer skills predicted by the model was 2.34, meaning that each one-point increase in computer skills was associated with the odds of adopting Cyber-Extension increasing by 2.47 multiplicative factor.

**Recommendations**

The study showed that raising extension agent’s computer skills can increase the probability of adopting Cyber-Extension. Two suggestions were made in this study. First, as the adoption level in the implementation and confirmation levels were still very low, strategies must be developed to socialize Cyber-Extension to extension agents, typically those who are in the knowledge level. Second, training to improve the extension agents’ computer skills was necessary to increase the likelihood of Cyber-Extension adoption among extension agents. These will lead to the successful implementation of Cyber-Extension and other ICT-based extension in Indonesia.

**References**


Helmy, Z., Sumardjo, S., Purnaningsih, N., & Tjitropranoto, P. (2013). Cyber Extension in Strengthening the Extension Workers’ Readiness in the Regencies of Bekasi and


Exploring the Status and Use of Information and Communications Technology (ICT) for Accessing Agricultural Information in Rural Tanzania

Fally Masambuka
Mary T. Rodriguez, PhD
The Ohio State University

Introduction
Information communication technologies (ICTs) have been gaining popularity as a tool for increasing access to agricultural information among rural farmers in Sub-Saharan African countries, including Tanzania (Krone, Dannenberg & Nduru, 2016; Benard, Dulle & Lamtane, 2018). Among the major ICTs being promoted, mobile phones are receiving substantial interest from agricultural development entities. However, examples from Tanzania show that differences exist in the types of ICTs used as well as use among farmers involved in various enterprises (Temba, Kajuna, Pango & Benard, 2016; Krone, et al., 2016; Benard, et al., 2018). ICTs operate differently and require different resources and user abilities (Zhou, Lu, & Wang, 2010).

Therefore, in as much as ICTs are gaining popularity, not all ICTs are used in the same way by farmers. As such, it is necessary to assess the level of acceptance of these technologies among the intended users before making huge investments (Venkatesh & Davis, 2000; Marangunić & Granić, 2015). A needs assessment was conducted on the status and use of ICTs among smallholder farmers to explore the potential for using mobile phones in disseminating agricultural information to bridge gaps in physical access to knowledge and services. The following were the specific objectives of this study:

1. Determine agricultural production challenges of farmers in the Singida region.
2. Assess ICT capabilities, resource potential, and current access to and use of ICT devices within two pilot communities.

Methods
Literature reviews were conducted to determine the status of ICT use in Tanzania. This was followed by instrument development sessions with ICT experts from University of Dodoma and agricultural experts from Sokine University of Agriculture. The developed questionnaire was administered to 89 participants in two communities in Singida region, Tanzania. Following data collection, SPSS v.25 was used to analyze the data generating descriptive statistics.

Results
Objective 1: Agricultural production challenges
Villagers expressed facing various challenges to their production (top three): access to water (97 percent); crop pest and diseases (94 percent); and failure to buy improved seeds (89 percent). However, access to information on improved technologies was indicated as a challenge by only 39 percent of the farmers: majority from Muganga (n=23) and amongst men (n=28). Similarly, a lack of information on markets was indicated by 38 percent: mostly by men (n=21) and respondents from Muganga (n=18). Finally, a lack of information on credit was expressed by 24 percent of total respondents, majority men (n=17) and respondents from Ghalunyangu (n=20).

Objective 2: Assessment of ICT capabilities

209
Results indicated that most farmers, have access to a mobile phone (97 percent) and radio (93 percent). The phone was reported as the most often used communication device 79 percent (n=25 women, n=45 men). However, 43 percent of respondents (n=26 men, n=12 women) indicated they borrow the mobile phone while only 15 percent of respondents (n=4 men, n=9 women) indicated having a mobile phone available to them in the home. When exploring current sources of agricultural information, most farmers (91%) indicated that they access agricultural information from family and friends followed by other farmers (87%). Pertaining to technology use, 72 percent of farmers indicated using radio for information; none indicated accessing agricultural information using a mobile phone.

**Conclusions/Recommendations**

Water, pests and diseases, and failure to buy improved seeds are the three major challenges facing farmers. However, the findings indicate that access to information on improved technologies is not considered a major challenge among farmers especially among women. This is the case despite increased reports that lack of expert knowledge is the major challenge faced by most smallholder farmers (URT, 2005; Daniel, et al., 2013; Ministry of Agriculture, 2015-2016). While farmers may have challenges when accessing agricultural information, they do not consider that as a major challenge. As such, it is recommended that more research should be conducted to understand if access to information is indeed a pressing need amongst farmers.

The findings of the study indicate that the mobile phone is the most often accessed and used communication device. However, unlike in other studies that were conducted in other regions of Tanzania where farmers indicated use of as mobile phones when accessing agricultural information (Angello, 2015; Temba, et al., 2016; Krone, et al., 2016; Benard, et al., 2018), Singida farmers indicated that they do not use mobile phones to access this information. Results shows even though mobile phones are gaining popularity, not all farmers are accessing agricultural information using this technology. This further demonstrates the need to understand specific needs of each community before investing in ICT development and dissemination.

**References**


Extension Officers’ Willingness to Use Information Communication Technologies to Interact with Farmers in Trinidad

Lendel K. Narine
Utah State University Extension
Amy Harder
T. Grady Roberts
University of Florida

Introduction/Theoretical Framework
The National Food Production Plan of the Ministry of Food Production, Land and Marine Affairs sought to improve the competitiveness of Trinidadian farmers. The mobilization of the national plan depends on the effectiveness of Ministry Extension. However, the Ministry Extension struggled to provide adequate services to farmers with an Extension-to-farmer ratio of 1:600 and a reliance on top-down extension methods (Ramjattan, 2016; Seepersad, 2003). Information Communication Technologies (ICTs) have been touted as an effective way to serve Caribbean farmers (Ganpat & de Freitas, 2010).

This study was guided by Rogers’ (2003) Diffusion of Innovations (DOI) theory. Rogers identified five characteristics of an innovation. In order of predictive power, these are relative advantage, compatibility, complexity, trialability, and observability. Yet, Moonsammy, Narine, Harder, and Rodriguez (2017) found complexity was the most important innovation attribute affecting Grenadian farmers’ adoption of irrigation systems. However, Strong, Ganpat, Harder, Irby, and Lindner (2014) found most Extension officers used ICTs for personal reasons suggesting officers have the capacity to use ICTs. In contrast, Ramjattan (2016) found a deficiency in content appropriate for delivery through ICTs in Trinidad. Further, Ramjattan found officers perceived a low level of institutional support from superiors and a lack of enabling policies to use ICTs. These studies imply ICTs may have lower compatibility in Extension in Trinidad.

Purpose
This study sought to describe Extension officers’ perceptions towards the innovation attributes of the Short Messaging Service (SMS) as a formal communication channel with farmers of Trinidad. The objectives were to: (a) describe Extension officers’ current use of ICTs to interact with farmers, and (b) explain Extension officers’ perceptions towards the attributes of using SMS to interact with farmers.

Methods
This study followed a causal comparative design and relied on data from Extension officers of the Ministry Extension of Trinidad. Trinidad has an estimated population of 96 frontline Extension officers (W. Ganpat, [Dean, Faculty of Food and Agriculture, The University of the West Indies] personal communication, March 11, 2018). This study attempted to a census, and with 94 officers surveyed in May of 2018, the response rate was 98%. The DOI theory guided development of a researcher-made questionnaire. The Tailored Design Method (Dillman, Smith, & Christian, 2015) informed item design to ensure face validity, and a panel of experts with specializations in extension education reviewed the questionnaire for content and construct.
validity. The final questionnaire was administered to the sample via face-to-face interviews. Results of this study were presented as descriptive statistics.

**Results**

Most Extension officers (88%) contacted farmers through voice calls, while about 64% used SMS. Fewer Extension officers used email (40%), social media (34%), and Multimedia Messaging (MMS) (34%) to communicate with farmers. Only 6% of officers used video calling to communicate with farmers. A follow-up question asked about Extension officers’ willingness to use ICTs for farmer interactions. Extension officers were willing to use MMS (81%), SMS (79%), email (73%), mobile phones for voice calls (64%), and social media (58%) to communicate with farmers. Results indicated Extension officers tended to agree SMS had favorable complexity ($M = 4.02, SD = .61$), relative advantage ($M = 3.78, SD = .79$), and trialability ($M = 3.69, SD = .78$). Officers perceived SMS had less favorable observability ($M = 3.27, SD = .97$) and compatibility ($M = 3.10, SD = .90$).

**Conclusions/Recommendations/Implications**

Extension officers were either already using or willing to use modern ICTs to communicate with farmers. This suggests there is a potential for Extension to use SMS and MMS to communicate with farmers in Trinidad. This may reduce the need for frequent farm visits, which eases the time constraints of Extension officers and reduce travel costs incurred by Extension. While officers perceived SMS had favorable relative advantage, complexity, and trialability, there is there is a need to improve the compatibility and observability of SMS to facilitate Extension officers’ adoption of SMS to interact with farmers.

Enabling policies and managerial support is needed to improve the compatibility of using ICTs for farmer interactions. Administrators should promote ICT use and facilitate social acceptance of the technology. Extension officers must understand the advantages of using ICTs over traditional methods and gain support from supervisors and peers to use ICTs for regular interactions with farmers. ICTs are already a critical part of Extension, but a supportive work environment is needed to ensure it is effectively adopted to communicate with farmers. Future research is needed to explore the supervisory and policy support for ICTs as an alternative extension method in Trinidad.

**References**


Promoting Effective Use of ICTs with Technology Stewardship: Findings from a Training Course for Agricultural Extension Professionals in Trinidad and Tobago

Gordon A. Gow
University of Alberta
Ataharhul Chowdhury
University of Guelph
Jeet Ramjattan
Wayne Ganpat
University of the West Indies

Introduction
The adoption and use of information and communication technologies (ICTs) for small-scale agriculture and fishers in the Caribbean region remains a priority for extension training and professional development (XXXXXX, 2016). Recognizing the need to improve ICT competencies of both participants and professionals in extension, the XXXXXX at the University XXXXXXX in collaboration with XXXXXXX is developing and testing a set of open educational resources on “technology stewardship” for agricultural communities of practice.

Technology stewards are social intermediaries “with enough experience of the working of a community to understand its technology needs, and enough experience with or interest in technology to take leadership in addressing those needs” (Wenger, White & Smith, 2009, p. 25). An appealing feature of the technology stewardship approach is its emphasis on facilitating transformative change as contrasted with transfer and diffusion of ICT (Avergou, 2008). Technology stewards can be viewed as change leaders (Kotter, 2007) who enhance the informational capabilities of a community of practice by facilitating appropriate and effective use of ICTs as a form of social practice (XXXXXX, 2018).

Findings from pilot studies conducted in Sri Lanka suggest that technology stewardship can build local capacity for change leadership among extension professionals, while instilling confidence and skills needed to promote transformative ICT practices within a community of practice (XXXXXX, 2018; XXXXXXX, 2017).

Purpose and Objectives
Technology stewards facilitate transformational social practice to help their communities be more self-determined in choosing how and when to use ICT in response to local needs and aspirations. The open educational resources that we have been pioneering in the Caribbean are intended to introduce agricultural practitioners to the concept of technology stewardship and to provide accessible training and mentorship in a set of simplified action research competencies, including community engagement, ICT prototyping and testing, as well as evaluation and reporting methods. In this study, we report findings of the assessment of a technology stewardship training course organized for 19 agricultural extension professionals in March 2018 in Trinidad and Tobago.

Method
Drawing on the Kirkpatrick & Kirkpatrick (1994) training evaluation model, data were collected at three levels of reaction, learning, and behaviour using a pre-course survey, student feedback, classroom observation, and semi-structured interviews with participants. The model was used to assess the quality of the course materials, student response and learning, and influence on professional practice.

**Results**

The findings indicate a positive reaction of the participants about the course, course materials, and quality of instruction. About 90% of the participant indicated that they were motivated to learn more about the subject area, all participants agreed that their knowledge of the subject area was increased, and 95% of the participants assessed the course excellent overall. 92% of the participants completed an individual action plan immediately after the training, and 40% of participants reported making progress in applying various skills learned in the course during a three week follow up period. Participants were able to improve their ICT competencies and skills as they became motivated to apply new techniques and tools in community engagement and knowledge mobilization. The group has remained connected with each other using social media, sharing information and seeking advice. These interactions proved vital in enabling the participants to address ICT issues as well as other problems encountered in their work routine. These findings suggest that the course had a positive influence on professional practice, with a number of participants demonstrating characteristics of emerging technology stewards within their own communities of practice.

**Implications**

Results from the technology stewardship training course are promising. The emphasis on change leadership is an important consideration for professional training within extension and should be further studied with respect to improving effective use of ICTs in agricultural communities of practice. Additional effort will be needed to continue to refine the course material, and a blended learning approach with online training modules is being considered. Some participants reported institutional obstacles when attempting to apply the training in practice, and further involvement of senior level managers and administrators may be necessary to better communicate the stewardship concept. Future work will benefit from longitudinal research of cohorts that complete the training program to examine longer term impact on ICT adoption and use.
References

XXXXXX. (2016). XXXXXX

XXXXXX. (2018). XXXXXX

XXXXXX (2018). XXXXXX

XXXXXX (2017). XXXXXX


Program Evaluation Competencies for Extension Professionals: Evaluation Specialists’ Consensus for International Extension

John Diaz  
University of Florida  
Anil Kumar Chaudhary  
The Pennsylvania State University  
K.S.U. Jayaratne  
North Carolina State University

Introduction

Extension competency models include evaluation as a core competency for Extension agents (Brodeur, Higgins, Galindo-Gonzalez, Craig, & Haile, 2011). These professionals are expected to conduct meaningful evaluations to determine the success of their educational programs.

Competency models were first popularized when McClelland (1973) challenged the idea of using intelligence tests. Ghere, King, Stevahn and Minnema (2006) developed an initial competency model for evaluators that was later adapted by Rodgers, Hillaker, Haas and Peters (2012) for Cooperative Extension. The model outlines 41 evaluation competencies for Extension agents across three domains: situation analysis, systematic inquiry, and project management. With data only from one state in the US, the Rodgers et al. (2012) study lacked generalizability of the competency framework to other Extension systems.

According to Lamm, Israel, and Diehl (2013), underdeveloped evaluation competencies undermine the evaluation activities conducted in Extension. In their study of over 1,200 Extension professionals, they found most Extension agents only administer post-test following an educational activity, focused on measuring participation and customer satisfaction. Agents’ lack of expertise limits their ability to measure long-term impacts (Lamm et al., 2013).

Purpose and Objectives

The objectives of this study were to determine what Extension evaluation specialists believe are core evaluation competencies that should be taught to Extension agents, the challenges they face in evaluation competency development, and the strategies that help them to overcome those challenges.

Methods and Data Sources

A three round Delphi technique (Warner, 2015) was used for the study. We purposively selected a panel of 45 evaluation specialists with experience in both domestic and international Extension. The panel averaged more than 12 years of experience and represented 31 different states. The Delphi technique is frequently used to develop consensus for priorities to guide competency development efforts (Warner, 2015). The first, open-ended round resulted in a list of 97 unique competencies, 75 challenges, and 63 strategies. The subsequent rounds utilized the definition of consensus as 2/3 of the group choosing extremely or very important regarding developing the evaluation competencies and challenges specialists face (Warner, 2015). We used similar consensus definition for perceived usefulness of each strategy with consensus being 2/3 of the panel choosing very or extremely useful.
Results and Conclusions

The panel demonstrated consensus on 35 competencies with highest agreement on the following competencies: develop appropriately framed questions/measures to effectively assess program outcomes and needed improvements, develop a list of evaluation questions that will guide the evaluation design, use evaluation results to improve either an existing program or future programs, and use evaluation results to effectively develop and disseminate tailored messages to key stakeholder groups. There were several overlapping competencies with the Rodgers et al. (2013) model including instrument and question development, interpretation and communication of evaluation results, and developing a program logic model.

The panel agreed on 5 challenges with most important to address including: building capacity among a very large group of educators with limited time, evaluation being approached as an afterthought rather than being integrated into the programmatic process and insufficient budgeted, financial resources to facilitate systematic evaluation and evaluation capacity building. These results indicate that evaluation needs to become more of a priority within Extension and mirror structural and cultural impediments to Extension program evaluation success (Franz & Townson, 2008).

Finally the panel agreed on 23 strategies, with those viewed as most useful for addressing the major challenges including: hiring Extension evaluation specialists who understand the context of Extension, leadership serving as program champions for evaluation, applied, hands-on program evaluation training that makes connection to the trainee’s actual program applied, and more effective onboarding that includes program design and evaluation for new Extension professionals. These strategies focus on promoting a culture change within Extension through appropriate support, resources and expectations.

Recommendations and Implications

The findings of this study provide a framework for building evaluation competencies necessary for extension professionals in any extension system. By developing consensus among Extension evaluation specialists in various Extension systems in the US, this study guides extension professionals to address evaluation deficiencies in other extension systems. It also provides the opportunity to develop an evaluation competency assessment similar to that of Rodgers et al. (2013) to measure competency development at an international level.

The findings also set an important foundation for policy and structure to ensure the evaluation capacity building is effective and can be sustained. A culture change is necessary to promote the effective evaluation of Extension programs. Addressing the challenges that range from resource availability to administrative support can help enhance evaluative capacity building in any country.

References


Exploratory Factor Analysis and Internal Consistency of Agricultural University Students’ Critical Thinking Attitudes

Peng Lu
Matt Baker
Texas Tech University

Introduction
Critical thinking is reasonable reflective thinking that is focused on deciding what to believe and do (Ennis, 1987). It is an essential skill that can be applied in many different disciplines. However, researchers have asserted that it is necessary to think critically within specific disciplines (Ennis, 1990). Rudd, Baker and Hoover (2000) posited the following definition of critical thinking: “[It] is a reasoned, purposive, and introspective approach to solving problems or addressing questions with incomplete evidence and information and for which incontrovertible solution is unlikely” (p.5). Researchers stated that critical thinking requires a set of skills and attitudes (Ennis, 1987, 1996; Halpern, 1998; Halonen, 1995; McPeck, 1981). Millar and Tesser (1986) believed that attitudes were conceptualized as an affective and cognitive components and subsequent related behaviors. Thus, affective and cognitive attitudes will be translated into behaviors of critical thinking.

The way critical thinking is measured has always received extensive attention by educators. A number of tools are available to assess critical thinking, however, many of the most popular instruments have been commercialized which makes their use a challenge for program assessment in developing countries. Thus, we are developing an instrument to measure critical thinking that we hope, when developed, to make it available at no cost to our colleagues in other countries. This research was guided by psychometric theory, which allows researchers to measure concepts indirectly rather than through physical characteristics (Nunnally, 1967).

Purpose and Objectives
The purpose of this study was to develop a critical thinking assessment instrument. The following objectives guided this study: (1) examine the appropriateness of the items and the internal structure of the constructs through Exploratory Factory Analysis (EFA), (2) determine the internal consistency of the factors, and (3) identify a factor structure for further development or refinement so that confirmatory factor analysis can be conducted.

Methods/Procedures
A preliminary version of the critical thinking instrument was developed based on literature reviews about critical thinking. We included twenty items on a five-point summated scale ranging from 1 (Strongly disagree) to 5 (Strongly Agree). Our original items included statements about cognitive understanding, affective feelings, and likely behaviors. The instrument was distributed to agricultural undergraduate students at Texas Tech University in selected face-to-face courses (N=113). SPSS.25 software was used to conduct EFA and reliability analysis. Kaiser’s criteria of eigenvalues greater than 1.0 was applied to determine the numbers of factors (Kaiser, 1960). Oblique rotation was used because there is no reason to assume factors were perfectly independent (Preacher & MacCallum, 2003). Factor loadings of .3 or greater were used as a cutoff value to determine the loading factors (Field, 2018).
Results
The KMO measure of sampling adequacy was .89, and the Bartlett’s Test of Sphericity was significant, $\chi^2(153) =967.352, p<.001$. These measures indicated the data were appropriate for EFA. The result revealed that two factors had eigenvalues over 1.0 and in combination explained 44.14% of the variance. After extraction, Factor 1 accounted for 35.30% of the explained variance, and Factor 2 accounted for 8.83% of the explained variance. After rotation, 18 items loaded onto the two factors with absolute values of greater than 0.3. Twelve items loaded on Factor 1 and 6 items loaded on Factor 2. Two items did not load on any factors. Cronbach’s alpha value for Factor 1 (alpha = .93) was excellent, and Factor 2 (alpha = .72) was acceptable (Cronbach, 1951). Our results produced a two-factor structure.

Conclusions and Recommendations
We identified the factor structure of an instrument that was developed to assess critical thinking. EFA reduced 20 items into two-factor structure, which facilitates easier interpretations. We determined two latent constructs underlying 20 items. We interpreted and labelled the two factors as evaluation and analysis based on the content of items. This study presents an essential first step in assessing evaluation and analysis skills of critical thinking for university students. The next step is for us to use R software to conduct Confirmatory Factor Analysis to test specific latent constructs of the instrument. Once this empirically based critical thinking instrument is confirmed, we will make it available at no cost to others wanting to use the instrument. Our goal is that all educators can use the critical thinking instrument to better understand critical thinking attitudes of their students for academic program assessment purposes.

References
Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. Psychometrika, 16(3), 297-334. doi:

Analysis of School Garden Performance in the Southwest Region of Ghana

Rafael Quijada
Emily R. Oliver
Amy Boren-Alpizar
Texas Tech University

Introduction
The attention of schools and communities on school gardens as a part of the curriculum has increased over the last few years (Waliczek, Bradley, & Zajicek, 2001; Ozer, 2007 & Cutter, 2009). Robinson & Zajicek (2005) define school gardens as places where children can work in teams, make decisions and manage problems. Blair (2010) states that school gardens have positive effects on children’s science achievement and food-related behaviors. In Africa, school gardens are often promoted as a food security initiative (Laurie, Faber, & Maduna, 2017). While school gardens in the African context have demonstrated success (Laurie, van den Heever, Malebana, & Faber 2013), educators responsible for the school gardens have lamented their lack of skills and knowledge for effectively managing school gardens (Deen, Scanga, Wright, & Berahino, 2017), thus calling into question the sustainability of school gardens.

Purpose and Objectives
The purpose of this study was to evaluate school garden performance in the Southwest region of Ghana. The following research objectives guided this study:
1. Describe the current situation of school gardens in the Southwest region of Ghana.
2. Design a rating-scale to assess school garden performance.
3. Assess school garden performance using the rating scale.
4. Identify the main challenges of school gardens perceived by teachers in the Southwest region of Ghana.

Methodology
A census sample was collected of schools with school gardens and descriptive statistics were performed. A modified version of the School Garden Assessment Tool (Ullery, 2013) was used to assess the school gardens’ performance. The tool is descriptive and uses a rating scale from 1 (poor) to 10 (outstanding) to assess the performance of school gardens based on criteria from curriculum to active learning to income generated by the sales from the produce of the garden.

Results and Conclusions
Using the rating scale, the school gardens’ performance is mostly classified as satisfactory (50%). However, many of the school gardens did not meet the requirements and expectations of a school garden, such as providing a wide variety of activities to enable students’ learning and growth. Only 2% of the school gardens had access to farm equipment and a water supply. Some schools (44%) produced a single crop and the other 66% produced two or more crops. Additionally, 24% of the school gardens use animals as part of the program curriculum.

Regarding the teachers’ experience, results indicate that 100% of the teachers reported having no agricultural training. They identified six main challenges to the success of the school gardens, including a lack of inputs, lack of necessary skills, insufficient time with children in the garden,
theft, access to water, and access to land. Most of the challenges identified by the teachers are found in garden systems elsewhere in Ghana (Yiridoe & Anchirinah, 2005).

**Recommendations**

This study is a baseline to provide insight into the issues related to the performance of school gardens in the Southwest region of Ghana. While the school gardens mainly performed satisfactorily, several interventions could improve their performance. First, we recommend that teachers be provided with professional development in agricultural education and the use of a garden as a didactic tool. This would enhance their ability to engage their students more effectively in agricultural concepts and could provide new ideas for learning activities. Second, schools will need to explore how to overcome the limited access to water and land if they truly want their garden programs to thrive. This is no small task, but if school gardens are to be sustainable and profitable over the long term, these issues will need to be tackled – perhaps through political action at the local level. Finally, school administrators may need to leverage additional resources for their school gardens through creative partnerships with input providers. None of the recommendations is an easy solution to the issues facing school gardens in the Southwest region of Ghana, but they are the primary impediments to their successful performance.

Future studies can be developed to evaluate the reliability of the School Garden Performance Rating Scale, particularly in the context of developing countries. The original scale was designed for use in the United States. Another area of inquiry could be the exploration of the impacts of teacher training on school garden performance. Teachers reported they had no training in agriculture, and yet were expected to successfully manage the school garden while using it to teach students. A study evaluating the school gardens’ performance before and after teacher training in agriculture could provide insight into the role of agricultural education in enhancing garden performance.

**References**


Assessing Impact of a Mandela Washington Fellowship Institute for Entrepreneurs from Sub-Saharan Africa: A Phenomenological Study

Alexander J. Smith
M. Craig Edwards
Craig E. Watters
Matthew W. Rutherford
Oklahoma State University

Introduction & Conceptual/Theoretical Framework
Sub-Saharan Africa (SSA) is part of the world’s youngest, poorest, and fastest growing continent. As scholars study why its development has been slow compared to the rest of the world, a lack of investment in human capital emerges as a prevalent reason. Regarding agriculture, in particular, resources supporting technological innovations that do not fit SSA’s needs could be invested in other ways that may optimize the sector’s efficiency and profitability (Toenniessen, Adesina, & DeVries, 2008). In an effort to facilitate international development of this kind, Oklahoma State University was awarded a grant resulting in a six-week-long entrepreneurship education program (EEP), or “Institute,” during the summer of 2017. The Institute provided training for 25 entrepreneurs (i.e., Fellows) from 17 SSA countries, many of whom were agricultural producers or food purveyors.

The Institute’s program was designed to develop and improve the participants’ entrepreneurial proficiency by providing instruction in financing, business planning and management, creativity, networking, and technical skills. The providers assumed that the Fellows’ knowledge and skills about entrepreneurship could be improved; hence, the study’s conceptual framework was human capital theory (Schultz, 1961; Welch, 1975). The premise that participants would enhance their entrepreneurial abilities by adopting attitudes and acquiring learning that presaged new behaviors was also supported by Ajzen’s (1991) theory of planned behavior (TPB).

Purpose/Objective
The study sought to examine the impact an EEP had on selected Fellows regarding how they practiced entrepreneurship in new ways after returning to their home countries.

Methods/Data Sources
Approaches to entrepreneurship education are well-debated topics in the literature, and how to best evaluate such educational programs remains an open question. Due to the lack of consensus on how to capture the true impact of an EEP, the researchers opted to use qualitative methods to conduct a phenomenological study. Seymour (2006) concluded that phenomenology is a useful tool to analyze entrepreneurship because entrepreneurs exercise behaviors in reaction to the opportunities they recognize, but doing such is complicated due to the broad spectrum of human decision making. Moustakas’ (1994) nine principles of transcendental phenomenology guided the study. Along with Moustakas’ principles, the investigators also followed Tracy’s (2010) eight indicators of high quality qualitative research to increase the likelihood of a thorough and rigorous study.
Maximal variation sampling (Creswell & Clark, 2017) was used to capture a diverse set of perceptions. The Fellows interviewed included six men and six women, each from one of 12 SSA nations. The participants were interviewed via online technologies about nine months after the program’s end; each interview lasted approximately 45 to 60 minutes. The interview transcripts were analyzed through the procedures described by Moustakas (1994): the Epoche, which involves bracketing, i.e., a process by which researchers self-identify their biases; horizontalization, whereby researchers organize significant statements from the interviews with all having equal value; phenomenological reduction, the creation of themes from the interviewees’ quotes; and imaginative variation, which tested the researchers’ assumptions supporting their thematic organization. In addition, Nvivo 12 was used as an organizational tool during data analysis.

**Selected Results/Conclusions**

Based on data analysis, four themes and seven sub-themes emerged, as did the phenomenon’s essence. The emergent themes were improvements, changes, and challenges to their business models (three sub-themes); self-improvement and empowerment (two sub-themes); social change (two sub-themes); and lessons learned from fellow Africans. All themes were supported by a number of participants’ quotes. For example, from the theme improvements, changes, and challenges to their business models, a Fellow said: “I have introduced about six new products. Interestingly, I already have cakes. I have rebranded, I have a new logo. And, I am building a kitchen right now.” In support of the self-improvement and empowerment theme, another Fellow stated: “I think one of the most interesting topics that I experienced during the Fellowship was in creative thinking. I think that really helped me in thinking differently, outside of the box.” The themes and sub-themes coalesced to form the phenomenon’s essence: Building the capacity of socially responsible entrepreneurs for a new Africa.

**Implications/Educational Importance/Recommendations**

The findings can inform similar EEPs regarding their future programming. It is recommended that providers of EEPs stress rigor coupled with an ethos of accomplishment, which is likely to further enhance the participants’ perceptions of self-improvement and empowerment. Future research should assess the impact that formal training in business knowledge has on the decision making, i.e., actualized behaviors (Ajzen, 1991), and the long-term success of entrepreneurs who participate in EEPs.

**References**


Formation of African Fellows’ Entrepreneurial Identities: Evaluating a U.S. Fellowship’s Impact

Richie Roberts
Morgan A. Richardson
Louisiana State University
M. Craig Edwards
Craig E. Watters
Oklahoma State University

Introduction/Theoretical Framework
Scholars (Giamartino, 1991; Naudé, 2014) have continuously stressed the critical role that business and entrepreneurship (B&E) plays in propelling countries on a positive development trajectory. As a consequence, a number of development approaches have focused on promoting best practices in regard to B&E. Recent emphasis, however, has been placed on the formation of individuals’ entrepreneurial identities, i.e., to view themselves as entrepreneurs (Harmeling, 2011). In 2018, Oklahoma State University hosted 25 participants (“Fellows”), aged 25 to 35, from 20 Sub-Saharan African (SSA) countries for a six-week-long Institute that focused on sharing critical B&E principles as part of the Mandela Washington Fellowship (MWF). The Fellows who attended Oklahoma State University’s Institute either were or aspired to become agricultural entrepreneurs or food purveyors. To understand better the social processes Fellows underwent during the Institute, we grounded this study in Donnellon’s, Ollila’s, and Williams Middleton’s (2014) entrepreneurial identity framework (EIF).

Purpose
This study’s purpose was to describe a 2018 MWF Institute’s (MWFI) role in its participants’ forming entrepreneurial identities.

Methods/Data Sources
Q methodology was used to achieve the study’s purpose. Q seeks to explain participants’ holistic patterns of thought (Brown, 1980). In Q, correlations are made among participants’ sorts, and data are reduced to factor arrays by using factor analysis procedures. Next, naturalistic techniques are employed to interpret the factor arrays and understand variant perspectives on a phenomenon.

A central tenet of Q is concourse theory. A concourse represents the range of participants’ views in the form of statements (Watts & Stenner, 2013). To develop the concourse, we had previously analyzed qualitative focus group data and written reflections collected during Oklahoma State University’s 2017 MWFI and relevant literature. Donnellon et al. (2014) EIF served as a lens to analyze the data and develop four theoretical categories, which structured a sampling of 36 statements to facilitate the study’s procedures. In this instance, the Fellows sorted statements onto a quasi-normal distribution curve ranging from -4 to +4. Thereafter, the Fellows’ sorts were uploaded into PQ Method® version 2.35 (Schmolck, 2014). With the assistance of PQ Method®, we conducted three statistical tests: (1) correlation, (2) principal component analysis, and (3) computation of factor scores. In addition, Varimax rotation was used to attain a simple structure. As a result, we selected a three-factor solution with a base significance of .42 that
captured 24 Fellows and 37% of the total variance. Correlations among factors were negligible. To make sense of the factors, we employed Mauldin’s (2012) recommendations to scrutinize array positions, distinguishing and consensus statements, factor loadings, and the Fellows’ personal and professional characteristics.

**Results/Conclusions**

Our analysis produced three factors: (1) *Emerging Entrepreneurs*, (2) *Reflective Entrepreneurs*, and (3) *Social Entrepreneurs*. These factors represented the Fellows’ perspectives of their entrepreneurial identities as a result of experiences during the 2018 MWFI. For example, *Emerging Entrepreneurs* perceived the Institute helped them view themselves as entrepreneurs (1, +3) and also provided guidance on how to grow and develop entrepreneurially in the future (10, +4). They also perceived that the constructive criticism (4, +4) given at the Institute provided direction (13, +3) for their B&E endeavors in the future.

The second factor, *Reflective Entrepreneurs*, was primarily comprised of females (4/5). They perceived the Fellowship facilitated critical reflection on their core values (29, +4) and helped them better understand the need for a support network (9, +4; 3, +3). As such, the experience helped these Fellows reevaluate their business practices and make plans to implement changes after returning home (33, +3). Meanwhile, *Social Entrepreneurs* indicated the Fellowship opened their eyes about the roles entrepreneurs can play to assist local communities in overcoming a variety of challenges and ills (18, +4). These participants also perceived the Fellowship aided them in understanding how to use their B&E stories to enact positive change (36, +4; 35, +3).

**Educational Importance/Implications/Recommendations**

If viewed through the lens of Donnellon et al. (2014) EIF, findings suggest the Institute positively affected formation of the Fellows’ entrepreneurial identities. Such findings are noteworthy considering that recent shifts in entrepreneurship education and development approaches place greater emphasis on entrepreneurs developing identities (Harmeling, 2011). The findings also generated several implications for providers of MWFIs or similar programs. For example, at Oklahoma State University’s Institute, Fellows engaged in a range of activities such as seminars, enterprise shadowing, B&E conceptual pitches, professional networking, and site visits to foster the growth and maturation of their entrepreneurial identities. We recommend providers of future MWFIs or similar programs consider incorporating such experiences.

**References**


Farmers’ Experiences with Irrigation: A Phenomenological Photovoice Study

Whitney Stone
Abigail Borron
Jessica Holt
Adam Rabinowitz
University of Georgia

Introduction
Water is a commodity that in many parts of the world has become scarce or on the verge of becoming a non-existent natural resource. Population growth and climate change contribute to an ever-increasing demand of water and inconsistency of rainwater respectively (Mahafza, Stroutenborough, & Vedlitz, 2016). Tied directly to the ongoing demand of increasing food production and establishing economic security for communities, agriculture consumes 70 percent of the world’s fresh water use (World Bank Group, 2017). Multiple recommended solutions to reduce agricultural water consumption include efficient irrigation technologies and scheduling (Levidow et al., 2014; Manganiello, 2017), growing crops that require less water (Moore, Coleman, Wigmosta, Skaggs, & Venteris, 2015), reducing land used for farming during times of water shortage (Ward, 2014), and altering current water consumption policies (Dinar, 2015; Manganiello, 2017; Scheierling & Treguer, 2016). However, tied to each of those recommendations is the livelihoods of farmers, the vitality of their farms, and the sustainability of agriculture.

Purpose & Objectives
Through a phenomenological approach using photovoice, this research critically examines farmer perceptions related to their selected irrigation practices and the intersectionality of issues that have a direct or indirect impact on farmer water use and conservation. Three research objectives guided this study:
• RO1: To examine farmers’ lived experiences within the framework of phenomenology to provide insight into the individual decision-making processes of farmers regarding water use and water efficiency.
• RO2: To identify the issues that have an impact on farmers’ irrigation practices.
• RO3: To examine the influence a phenomenological approach has on the researcher in collecting and analyzing data, and reporting results as it relates to farmers’ lived experiences.

Methods
As part of a larger interdisciplinary project that examined the use of water sensor technology in farmers’ fields, this study partnered with ten peanut and cotton farmers in a Southeastern state. Working in partnership with Extension agents across five counties, the researchers invited each of the ten farmers to participate in a photovoice project to share their experiences and decision-making processes around irrigation. For a two-week period in August 2018, each farmer was instructed to take and text up to 25 photos to a designated Google number. Project guidelines encouraged the participating farmers to take photos based on issues they or other farmers face regarding irrigation practices or technology, in addition to non-water-related issues or responsibilities that affected irrigation decision-making.
One-on-one semi-structured interviews were then scheduled with each farmer at his/her farm. These interviews were audio recorded, and employed a semi-structured, open-ended list of questions that specifically used the individual’s photos as the basis for content and information sharing. Using grounded theory (Charmaz, 2006), a constant comparative analysis took place with each subsequent interview, incorporating additional probing questions to delve deeper into farmer-identified issues. One researcher followed up with select farmers via phone to ask additional questions, based on emerging data.

Results
Following data analysis, three themes emerged: (1) Mitigating farm stress – Farmers described that their positionality within the environment is symbiotically connected to the practices they seek to maintain the health of their crops, as well as their own mental health. (2) Barriers to farming – Farmers felt that the dynamic nature of agricultural policy, commodity prices, public utility prices, and the public’s perception of the farming community force them into situations and drive their decision-making. (3) Preservation of farming heritage – Farmers repeatedly described a recognized loss of freedom in their practices, as well as fear of losing their land, legacy, and credibility.

Implications
Integrating photovoice as a pre-interview method provided an in-depth way of examining participants’ experiences through daily windows or photographs of the farmers’ space, time, and existence. In addition, it captured experiences with critical decision-making, as well as preserved the participants’ point of view, while separating the researcher’s biases. The phenomenological examination of farmers’ individual lived experiences led to more holistically understanding the intersectionality of issues farmers face, uncovering critical information that is typically overlooked when external collaborators, such as Extension and the university system, concentrate on irrigation challenges alone.

As grand challenges continue to evolve, and research offers insight into new and emerging technologies that directly implicate targeted economic outcomes and production forecasts, the role of the farmers cannot be overlooked. The second phase of this study will continue with the phenomenological approach by conducting focus groups with the participating farmers, delving deeper into the emerged themes, while more critically examining the results-directed engagement opportunities on behalf of Extension.

References


Stakeholders’ Perceptions of Watershed Concerns in the Northern Range of Trinidad and Tobago

Jeanelle Joseph
Wayne Ganpat
Tessa Barry

Introduction
Stakeholders make decisions about watershed management based on their immediate need. Therefore, being able to identify who these stakeholders are, and how their actions and decisions affect watersheds are necessary. According to Grimble and Wellard (1997), classifying stakeholders based on those who affect (determine) a decision or action as opposed to those who stand to be affected by a particular decision or action (either negatively or positively) should be considered. Classification of stakeholders, allows a better understanding of why they may perform a particular action or how they perceive a particular issue. The identification of stakeholders’ perceptions of Trinidad and Tobago’s watershed management problems, causes and related solutions, is considered as the first step in terms of determining suitable collaborative approaches among various stakeholder groups for sustainable watershed management in Trinidad and Tobago.

Purpose and Objectives
This study sought to; i) assess similarities and differences of stakeholders’ perceptions on various watershed management problems, causes and related solutions, and ii) make suitable recommendations to address identified watershed issues.

Methods
Stakeholders from Northern Range Communities in Trinidad and Tobago were the focus of this investigation, based on a pre-determined two-category stakeholder grouping (non-institutional and institutional stakeholders) (Hein, van Koppen, de Groot & van Ierland, 2006). Interviews were administered orally with stakeholders from these two categories using a structured questionnaire.

Stakeholders were asked to rate on a five level rating scale, 1 to 5 (1-strongly disagree, 2-disagree, 3-undecided, 4-agree and 5-strongly agree) their level of agreement on the seriousness of ten suggested watershed management problems and 18 suggested causes of watershed management problems. Stakeholders were also asked to indicate on a scale of 1 to 5 (1-strongly disagree, 2-disagree, 3-undecided, 4-agree and 5-strongly agree), their level of agreement the importance of 10 suggested solutions that can be related to addressing the watershed management problems.

Pearson’s Chi-Square Test was used in order to be able to identify similarities or differences in the perceptions of the stakeholder groups and in instances where there were differences in perceptions existed, cross-tabulations were used to elaborate these differences.

Results
Both stakeholder groups shared similar perceptions on four of the ten suggested problems. Similar perceptions were shared on flooding, pollution due to indiscriminate dumping of garbage
at the roadsides and in waterways, excessive application of fertilizers and pesticides and over-cultivation of the land. In terms of flooding and pollution due to indiscriminate dumping of garbage, all stakeholder groups’ agreed that these were serious watershed management problems. Conversely, all stakeholder groups disagreed that over-cultivating the land and excessive application of fertilizers and pesticides, were serious watershed management problems. In terms of causes of these problems, stakeholder groups shared similar perceptions and agreed on seven out of the eighteen suggested causes. These included inadequate education and awareness campaigns, poor coordination between agencies when addressing watershed problems, inadequate garbage disposal and treatment systems, unenforced fines, being unaware as to whom to lodge an environmental complaint with and climate change. Regarding solutions to address watershed problems, all stakeholder groups shared similar perceptions and agreed on the importance of all ten suggested solutions. Some of these solutions included having more public education and awareness campaigns, having more coordination amongst Government agencies, the need for more coordination between Government agencies and NGOs, legislation should be clearly stated and specific and, ensuring that the land and water management policy is properly enacted.

**Implication and Recommendation**

Successful collaboration in watershed management requires all stakeholders share a common understanding about watershed issues and the impact these issues potentially have on the environment. Given that, there was a 40% similarity of agreement among all stakeholders in terms of watershed issues and 39% similarity among all stakeholder groups in terms of their agreement on the causes, efforts geared towards increasing similarity in perceptions on problems and causes are needed. According to Koontz (2013), evidence suggests that collaborative efforts may promote social learning, since through deliberation, stakeholders with different perspectives and information can learn from each other as they develop a shared vision and plan for moving forward.

One suitable social learning recommendation therefore should include active community and institutional collaboration, by having both institutional and non-institutional stakeholders engage with each other through a series of periodic community meetings facilitated by an identified key institution with a role in watershed management. These meetings should facilitate information sharing and constructive dialogue, used towards achieving better agreement on the watershed issues and causes of these issues.

**References**


Effects of Climate Change on Communal Conflicts and Clashes between Farmers and Herdsmen in Adamawa State Nigeria: Views of Household Heads, Midcareer Extension Students and Lecturers

Akeredolu Mercy
Assa Kante
Sasakawa Africa Association/Sasakawa Africa Fund for Extension Education,
Adebisi Adelana
National Horticultural Research Institute

Introduction
Communal conflicts between Fulani herdsmen and largely farming host communities often arise when movements of grazing cattle are not properly controlled and consequently graze on cultivated plants like cassava, maize etc. in farms in Adamawa State Nigeria. Attempts by farmers to register their grievance of destruction of their livelihood (food crops and cash crops) by the cattle of Fulani herdsmen is always stoutly resisted and escalating to communal conflicts (Akevi, 2014). Affected communities sometime put up restrictions in designated areas on movement and grazing of cattle and enforce compliance through coercive measures decreed by host community vigilante which may take the form of killing stray cattle or arresting and prosecution of defaulting owners (Abrak, 2015). Any attempt to moderate the activities of the Fulani herdsmen or request their exit is often aggressively rebuffed and the host community attacked sometimes with the assistance of mercenaries. (Durojaiye 2014)

This paper explores the views of household heads, extension officers and University lecturers on communal conflicts caused by Fulani herdsmen and evaluates the fact that there is a link between climatic change and these communal conflicts. Specifically, the paper explores the following:

- Describes the community clashes & their effects
- Outlines the causes of the clashes
- Presents existing views on the relationship of the communal clashes to climate change
- Suggests sustainable solutions to the clashes

Methodology
Adamawa State was purposively selected because it is has recorded high incidence of herdsmen/farmer clashes. Two communities that have experienced community conflicts, Gyawana and Shaforon, were randomly selected for the study and 80 household heads in the communities out of the 534 listed household heads in the local government office were selected for the study. All current mid-career students of Adamawa state University, (35) and 20 lecturers in the Department of Agricultural extension were interviewed for the study. Questionnaires were developed for the two groups and interview schedules developed for household heads. Data collected were analysed using frequency counts, percentages and means.

Results
Description of the community clashes in Gyawana and Shaforon Communities:
a) 3 groups of respondents (farmers, extension agents and lecturers) reported that there were casualties in the communities.
b) Attacks razed communities destroying houses, churches and other facilities.
c) Herdsmen killed men, raped and killed girls and women in the communities
d) People still missing and their whereabouts unknown.
e) Herdsmen attack regularly, especially during the harvest season.
f) Fulani herdsmen normally attack their target communities at the time they are most vulnerable.

Major Causes of the clash:
- Encroachment (100%)
- Attitude (91%)
- Damage to individuals and property (100%)
- Destruction of crops and farm produce (100%)
- Preponderance of Arms and weapons (100%)

Views of farmers, mid-career agricultural extension students and the lecturers on climate change as being the reason for community unrest:
- Desertification caused by climate change has adversely affected rural communities heavily dependent on natural resources crucial for individual wellbeing (EAs =100%; farmers=100%; Lecturers=97%)
- Climate change significantly undermines livelihoods and community growth thereby adversely affecting capacity to provide social services and economic opportunities and lack of opportunities to sustain livelihood makes indigenes communities very susceptible to conflicts) (EAs =92%; farmers=100%; Lecturers=86%)
- Climate Change impedes development, widens income disparities and ultimately fuels communal conflicts (EAs =100%; farmers=100%; Lecturers=100%)
- Famines, droughts, and climate change related disasters could claim thousands of lives and escalate existing tensions within and among communities (EAs =100%; farmers=100%; Lecturers=100%)
- Climatic change factors give rise to water related hazards; which causes draughts, floods, high tidal water causes salinity and acidity in soil (EAs =100%; Farmers100%;Lecturers=100%)
- Climate change factors impact negatively on land causing food scarcity and energy depletion, making people migrate and spiralling into communal conflict ((EAs =91%; Farmers=100%; Lecturers=96%)
- Catastrophes of climate change give rise to rivalries which cause ethnic conflicts and sometimes religious crisis (EAs =100%;farmers=100%; Lecturers=89%)
- Climate change impacts abroad can trigger massive migration of people, incite civil unrest and ultimately generate more global conflicts and crisis (EAs =100%; Farmers=100; Lecturers=81%)
- Change in weather patterns leads to drought and famine gives rise to food shortage. (EAs =99%; Farmers=98%; Lecturers=97%)

Climate change is a major contributor to communal conflict in Adamawa State. The Fulani herdsmen are completely dependent on resources of nature and this makes them go all out to get these resources thereby bringing them in conflict with largely agrarian populations also dependent on nature for their livelihood. The resistance on both sides ignites communal
conflicts. Government and partners should help establish communal pastures, grazing reserves and dams to enable Fulani herdsmen stay and graze their animals within designated areas.

References
Shiklam, J. (2014). Kaduna: Suspected Fulani Herdsmen Kill 123 in Fresh Attacks, This Day Newspaper.
Understanding Smallholder Farmers’ Preference for Institutional Support for Climate Change Adaptation: Evidence from Northwestern Ghana

Elsie Assan
Anil Kumar Chaudhary
Rama Radhakrishna
The Pennsylvania State University

Introduction
The projected impact of climate change on agriculture could erode gains made towards poverty reduction, food security, and sustainable rural development in Sub-Saharan Africa (Antwi-Agyei et al., 2017). Given that agriculture in Ghana is overly rain dependent, any variations in rainfall and temperature, could severely impact farmers’ livelihood and well-being.

Ghana annually loses about 6% of major staple food crops produced to climatic factors and natural disasters (Stanturf et al., 2011). Temperature variations due to climate change also found to cause significant loss in farm revenue in northern Ghana (Bawayelaazaa Nyuor et al., 2016). Therefore, it is important that farmers undertake adaptation measures to reduce their vulnerability to adverse climate change impacts (Bawakyillenuo, Yaro, & Teye, 2016). Additionally, it is important for state institutions and relevant stakeholders to develop strategies and policies which support the adaptation efforts of farmers. It is important that farmers’ preferences are incorporated in developing such institutional support for climate change adaptation to ensure success and enhanced food security and sustainable development.

Purpose and Objectives
The purpose of this study was to understand the current climate change adaptation practices of smallholder farmers in northwestern Ghana. We assessed current climate adaption practices used by farmers, their perception of the effectiveness of these adaptation practices, factors which hinder farmers’ ability to adapt to adverse climate change impacts, and identified farmers preferred institutional adaptation support for adapting to projected negative impacts of climate change and preferred sources of these supports.

Methods and Data Sources
A mixed-methods approach including key informant interviews (9), focus group discussions (5), and household surveys (124) was used. A convergent parallel design format of mixed-methods to gain complimentary insights on similar topic of our study using two research methods (Creswell & Plano Clark, 2011). Data were collected in June 2017 from Mettoh, Kasalgri, and Tabier communities of the Lawra district in Ghana. Non-probability sampling methods, i.e., purposive and convenience sampling, were used to identify participants for key informant interviews, focus group discussions, and household surveys. The criteria for selection included a person’s position in the community, willingness to participate in the study, and demonstrated knowledge of rainfall and temperature variations in their community. The household surveys were developed by researchers and its validity was established using a panel of experts. The qualitative data were analyzed using grounded theory approach along with constant comparative analysis while the quantitative data were analyzed using descriptive statistics. Both qualitative and quantitative data analyses methods were compared and complemented for interpretation. We operationalized
Climate change for this study was operationalized as changes in rainfall and temperature for the period between 2006 and 2016.

**Results and Conclusions**
The result from both qualitative and quantitative analysis suggest that variation of planting and harvesting dates, water and soil moisture conservation practices, soil fertility conservation practices, use of improved varieties, and crop diversification were the most popular adaptation strategies among farmers. Farmers generally considered the adaptation practices as effective for reducing their vulnerability to adverse impacts of climate change. Specifically, improved crop varieties, soil fertility conservation practices, water and soil moisture conservation practices, and use of irrigation were considered most effective in reducing adverse climate change impacts. Farmers identified lack of money, lack of or inadequate access to extension services, labor shortages and labor-intensive strategies, lack of information on weather, and old age or poor health as factors impeding their ability to reduce their vulnerability to adverse climate change impacts.

The institutional adaptation support preferred by farmers in order of ranking were provision of dams and dug outs, improved access to credit, farmer adaptive capacity building through extension services, and grant support to cover crop and livestock losses to due to climate variability. Farmers preferred to receive adaptation support from external agencies such as non-governmental organizations, research institutions, and local and national level governmental agencies. The results of the key informant and focus group interviews supported the findings from the household surveys. These findings provide a current snapshot of farmers’ perception of and barriers to adoption of adaptation strategies along with what institutional support they prefer to overcome identified barriers.

**Recommendations and Implications**
Findings of the study suggest a need for transformation of the agricultural sector and revamping of extension delivery services. These changes will improve farmers’ access to information and training important for reducing climate change induced vulnerabilities and improving farm households’ wellbeing. Climate change mitigation efforts of Extension and government agencies should consider farmers preferred institutional support to enhance adoption rate of climate change adaptation strategies.

**References**


Leveraging Problem-Solving Styles in Leadership Learning to Create Solutions to Address Complex Adaptive Problems

Cam Outlaw
Kevin Kent
Valerie McKee
Hannah Carter
University of Florida

Introduction

Complex adaptive challenges threaten the stability and success of the five global systems: food, environmental, economic, social, and health. By the year 2050, the global population is projected to be 10 billion and will accelerate global crises (Emmott, 2013; Carvan, 2015). Current initiatives to equip undergraduate learners with the knowledge, skills, and capacities for complex problem solving will not suffice as the challenges become more volatile, uncertain, complex, and adaptive (Carvan, 2015).

Innovative solutions spring from intersectionality (Johansson, 2017). Global Uncertainty, the first course of the Challenge 2050 Project certificate program at a public university, maximizes the use of these global problems through cognitive diversity (Reynolds & Lewis, 2017), emotionally engaged thinking (Stedman & Andenoro, 2015), and cooperative learning (Millis & Cottell, 1997). Through this cooperative learning program model, learners develop the creativity and commitment for addressing complex problems. The pressure of addressing global issues encourages learners to think more collectively rather than individualistically, a key capacity for future leaders (Petrie, 2014).

To facilitate this shift from individualistic to collective thinking, the course includes a lecture on problem-solving styles as according to Kirton’s Adaption-Innovation (KAI) theory (1976). The theory postures that all people are creative and capable of solving problems according to their style. Problem-solving style is observed and measured by the KAI inventory on a spectrum from highly adaptive (45), where structure and consensus is most preferred, to highly innovative (145), where structure and consensus is less required. In team situations, a gap of more than 20 points may cause differences in problem-solving.

Purpose

The purpose of this innovative educational program is to encourage the development of complex problem-solving capacity by leveraging intrapersonal qualities. This course facilitated the identification and development of problem-solving styles and personal values of learners to target the development of self-awareness, critical thinking and collaborative skills to encourage innovative solutions to global challenges.

Methods and Results

In the course, students were exposed to a variety of global, complex issues. The 39 students in this course represented freshmen to seniors as well as two foreign exchange students. Six of the 11 university’s undergraduate colleges were also represented.
In order to develop self-awareness, critical thinking, and collaborative skills needed to address global issues, the instructors designed a solutions proposal assignment requiring the application of key concepts of course materials and presentations. Instructors began the course by facilitating intentional and sequential discussions. First, students were introduced to five global systems. Next, after a values clarification exercise, students were asked to rank each of the systems by their interest, connection, and values.

Following the values clarification activity and discussion, instructors administered the KAI Inventory to identify students’ problem-solving styles. Students were then placed in project groups with their peers who shared top ranked systems and similar problem-solving styles according to their KAI scores (within 20 points). Within these groups, students brainstormed major issues in their system that need solutions.

After five classes, students were re-assigned to larger, integrated groups, developed with balanced representation of the systems and problem-solving styles. Students will complete their solutions proposal in this group.

The final project and development of a solutions proposal created a context for weekly reflections to record each student’s experience with identifying their values, relating to other systems and values, understanding their problem-solving preferences, working with their shared value groups, and working in their integrated group as they develop their solutions proposal. Weekly reflections documented the experience of students.

To date, six reflections have been collected from each student documenting the initial discussion of systems thinking, values clarification, working in like-minded groups, and initial reactions of being reassigned to larger, integrated groups.

Instructors observed positive feedback from students in their initial, like-minded groups, whereas the integrated groups displayed some friction and unsettledness. Preliminary findings from the reflections include statements such as:

“This is the most important class I have taken at [university].”
“I was really excited about working with [names]...I have to approach the final in a more creative way.”

**Conclusions and Application**

This experience led to the development of the “Intrapersonal + Integrated Solutions Development” framework. This framework allows participants to identify their personal values and problem-solving styles, collaborate with others, and challenge their abilities to develop complex, global, and multicultural solutions to real world issues by integrating their values and problem-solving styles. The framework can be adapted for any experience and utilized for audiences with diverse cultural differences, perspectives, and identities.

**References**


Introduction

According to the Food and Agriculture Organization (FAO, n.d.), farmers in Guinea engage in subsistence agriculture, growing crops on small plots to feed themselves and their families. In Guinea, inadequate infrastructure and poor access to agricultural extension services, technologies and inputs, undermine potential productivity. However, demand for food outstrips domestic production, forcing imports to fill gaps.

In November of 2016, an on-site educational program in Guinea was provided to leaders of higher-education programs to enhance program planning and improve educational outcomes through the Farmer-to-Farmer program. This was facilitated by Winrock International, sponsored by the United States Agency for International Development (USAID) and hosted by Ecole National D’Agriculture Et D’elevage (ENAE) De Macenta.

According to Moore and Rudd (2004), organizations that identify the core competencies and can tailor professional development training to specific areas and improves outcomes. Liles (2004) found that customizing programs will lead to quality outcomes. Strong (2011) identified educational need areas for extension and educational programs in developing regions.

International agricultural and educators continue to utilize needs assessments to identify competencies (Ghimire, Suvedi, Kapowitz, & Richardson, 2017; Lamm, Lamm, & Davis, 2017). Several researchers have reported the Borich (1980) model for needs assessment (Barrick, 1987; Garton & Chung, 1995; Layfield & Dobbins, 2002) can define priorities. Importantly, ensuring that educational leaders are involved in identifying potential educational strategies may increase the likelihood of achieving appropriate outcomes (Waters & Haskell, 1989).

Purpose and Objectives

This study is reporting on one aspect of an educational program (Farmer-to-Farmer) to improve the educational capacity of post-secondary agricultural education programs in Guinea. An initial aspect of this programs was to identify participants’ needs to improve their educational programs. The goals of this effort were to:

1. Define important aspects correlated to enhancing farmer driven extension systems.
2. Measure program participant’s current knowledge important program aspects.
3. Define priorities of educational needs and deliver a custom educational programs to address those gaps in educational knowledge.

Methodology

The researchers purposively sampled all the participants in the Farmer-to-Farmer program (N = 13) participants in Guinea. This was a 10-day educational program, but this research was
Questions used as program needs assessment were drawn from a training module used by the United States Agency for International Development (USAID) project, which is identified as Modernizing Extension and Advisory Services (MEAS) and serves as the content base of this project (Strong, 2011). These content areas in total represent a training module to address the professional development needs of individuals involved in managing and organizing educational programs.

**Results and Conclusions**

Considering the mean weighted discrepancy score (MWDS) for each strategic area, the top five areas with the greatest reported need (N=13) include: (1) Power Point presentations (5.72), (2) teaching financial management (5.51), (3) using SWOT analysis (4.5), (4) teaching marketing concepts (4.36) and (5) incorporating stakeholders (4.35). One notable result was the content areas of lecturing or how to conduct workshop had the lowest MWDS and likely not an area of focus.

Once the educational program was complete, a key result is to measure pre and post knowledge in needed areas. The top five content knowledge improvement areas and percent change in reported knowledge were (1) Utilizing the marketing and strategic planning (176% increase), (2) using Borich (1970) for program needs assessment (153% increase), (3) Using SWOT analysis (122% increase), (4) analyzing external influences in education programs (115% increase) and (5) strategies to conduct farm trails (67% increase).

These educational sessions offered interactive activities to share content areas and support developing agricultural programs. All the participants reported satisfaction with the program and felt it was a valuable use of their time. They specifically noted that the concept of beginning with an assessment of their needs and developing content priorities based on their results was a valuable approach.

**Recommendations, Educational Importance, Implications and Applications**

An implication of this program is to focus on developing strategic programs to increase sustainability and funding. Respondents reported that feel they can become more strategic and seek stakeholder needs and then develop programs that address those needs in order to build resources and increase program value. This results in an implication that hopefully builds education equity and independence (Waters & Haskell, 1989) that can improve program relevance and sustainability (Liles, 2004).

**References**


An Exploratory Measure of Self-Perceived Writing Skills of International Agricultural Educators

Taylor Rogers
Morgan Bullock
Tobin Redwine
Lacey Roberts
Texas A&M University
Raegan Pugh
Assemble

Introduction
AgriCorps is an American organization that sends fellows from across the country to developing countries, Ghana and Liberia, for 11 months to serve as educators on agricultural education, extension and agricultural practices (Clement, 2016). AgriCorps trains their fellows prior to leaving to their prospective countries to equip them with skills needed to be international agricultural educators, including: project-based learning, the ‘three circle’ model of agricultural education, inner formation and emotional intelligence, leadership and entrepreneurship, and storytelling (T. McKnight, personal communication, August 17, 2017). Since AgriCorps is training international agricultural educators to be storytellers, how effective is the training, and how competent are the fellows in terms of writing?

Purpose and Objectives
The purpose of this study was to quantitatively measure self perception of storytelling abilities in international agricultural educators. The achieve this, the researchers developed 2 objectives for this study:

1. Measure AgriCorps fellows self-perceived media writing skills before an intensive storytelling training.

2. Measure AgriCorps fellows self-perceived media writing skills after an intensive storytelling training.

3. Use paired sample t-tests to compare pre- and post-experience results.

Methods
Researchers used the Media Writing Self Perception scale was developed to measure writing skills in journalism and communication students (Lingwall & Kuehn, 2013). Researchers electronically distributed the MWSP to a census of 2017 AgriCorps fellows (n=8) for this exploratory and programmatic evaluation study.

The MWSP measures writing self-perception in five constructs (Lingwall & Kuehn, 2013, p.382):

Elaborative/Surface score (EL) - how much you like to think about your writing and how important writing is to you.

Reflective/Revisionist score (RR) - a measure of how much you like to review, edit, and revise your writing before you are happy with your final draft.
Writing Self-Efficacy score (SE) - a measure of your degree of confidence in your various writing skills, including spelling, grammar, punctuation, paragraph development, generating ideas, and organizing your writing.

Writing Apprehension score (WA) - a measure of the amount of perceived anxiety and worry that accompanies your writing assignments.

Social Media/Professional score (SMP) - a measure of your perceptions of social media writing, such as the kind of writing one does on Twitter and Facebook, and your belief about the importance of this type of writing as it relates to your career choice.

Data Analysis
Researchers conducted paired sample t-tests to see if there was any significant differences in pre- and post-experience scores on the MWSP constructs. Data was analyzed in JMP pro 14.

Results and Conclusions
Analysis showed statistically significant differences in the pre-experience and post-experience scores on the EL and WA constructs. The RR, SE, and SMP scores showed no statistical significance in change, denoting that no meaningful growth in skill level occurred for the group as a whole in those categories.

We conclude that the AgriCorps storytelling training contributed to positive growth in elaborative writing skills and reduced writing apprehension. Although no significant differences were observed in other constructs, most participants showed improvement in individual scores. Therefore, we conclude that storytelling training contributes to positive skill reinforcement for future international agricultural educators.

Recommendations
Statistically, AgriCorps training is positively influencing writing skills for international agricultural educators, and therefore should continue to implement the training for their fellows program. Other international agricultural educators could use this training as well to grow their elaborative writing skills and minimize writing apprehension, both in student and educator populations. Future researchers have the opportunity to discover what would increase development of skills across all constructs of the Media Writing Self-Perception Scale. Lastly, future research should be conducted to determine the intrinsic value of soft-skills in international agricultural education, including writing.

References

Needs of Ethiopian Wheat Farmers

Jonathan D. Ulmer
Kansas State University
Misty D. Lambert
Iowa State University
Bhadriraju Subramanyam
Shannon Washburn
Tesfaye Tadesse
Kansas State University
Fetien Abay
Mekelle University

Introduction
The Ethiopian diet is 14% wheat and wheat products, second in caloric intake only to maize (Minot et al., 2015). When comparing crops on gross value, wheat is the fourth or fifth ranking crop annually. The demand for wheat is increasing production and imports. Ethiopian wheat production is approximately 40% less per hectare than the world average (Gabriel & Hundie, 2004) and 72% of production stays in the farmer’s home for family consumption.

Storage of grains occurs in pits, underground holes, and natural material sacks (Gabriel & Hundie, 2004). Between these traditional storage practices and limited warehouse storage, pest and moisture damage are high. Post-harvest losses of wheat can range from 6 to 23% (Gabriel & Hundie, 2004). To combat losses from insects, 47% of farmers use pesticides and hermetic storage bags are at early stages of adoption (Minot et al., 2015). Adoption of these technologies does not always lead to proper usage. These factors have led organizations to assess the needs of Ethiopian farmers to increase proper adoption practices.

Purpose
The purpose of this study was to:

1. Identify perceived post-harvest needs of Ethiopian farmers.
2. Determine the level of risk associated with pesticide use by Ethiopian Farmers.

Methods
To assess baseline information from wheat farmers in Ethiopia, a random sample of 200 farmers was selected from four regions: Oromia, Amhara, Tigray, and the Southern Nations Nationalities & Peoples Region. Trained enumerators collected data by verbally asking each question and recording the participants answer. This overcame language and literacy barriers since only 83% of our respondents indicated the ability to read and write. The instrument was 65 questions about phases of post-harvest in wheat farming. This article addresses questions deemed specifically pertinent to assessing needs and planning educational programming.

Results & Conclusions
The Ethiopian wheat farmers want information with 33% of our respondents needing more information on dehulling, 35% on transportation, 43% on threshing, 45% on packing, 50% on reducing shatter, 52% on mold identification and control, 53% on drying, 55% on cleaning, 60%
on rodent or animal control, 63% on marketing, 64% harvesting, 68% on proper grain storage, 69% on insect identification and control, 70% on measuring moisture, 74% on pesticide handling and safety, and 75% on pesticide use. Most indicated they preferred to receive their information through large meetings, demonstrations, fellow farmers, or one-on-one.

When asked about the use of spent pesticide containers, 17% indicated using them to carry water while 14% use them for storing other products. When asked about the disposal of pesticide containers and packages, 44% bury them, 23% leave them on the ground, and 1% throw them in the water. Forty percent of participants indicated they treat the stored grain in their home with pesticides.

When asked the criteria they use for selecting grain for consumption, 92% indicated color, 83% lack of damage, 88% look at kernel size, 86% indicated lack of staining. Twenty-seven percent of respondents had eaten discolored grain, 34% grain with light insect damage, 12% with heavy insect damage, and 7% indicated consuming grain with a chemical odor.

**Recommendations and Implications**

Many to most farmers surveyed showed a desire for training in many areas of post-harvest wheat production. The use of pesticide containers for storage or vessels after pesticide use creates a dangerous health situation. Visual inspection of grain is a primary selection criteria for the consumption of grain, but may not be the most reliable. As organizations continue programs to improve food production in Ethiopia, it is important to understand farmers’ desire for training. It is common for organizations to avoid talking about pesticide application in an attempt to reduce the use of chemicals. As farmers seem to be using pesticide containers in inappropriate ways, farming instruction should include chemical safety training. Farmers in Ethiopia are eager for training in all aspects of post-harvest, but health factors like handling of used chemical containers and selection of wheat for food should be included. While men have reported to be involved in all aspects of post-harvest, women also play a significant role in the duties (Dessalegn et al., 2017); therefore, both men and women should be trained on these handling practices.

**References**


Perceptions of Leadership Development and Cultural Awareness Prior to an International Study Experience by Agricultural Leadership Program Participants

Daniel Radford
Joy Morgan
North Carolina State University

Introduction
When reviewing literature related to international study experiences, there is extensive research related to youth and college student’s experiences, but less research focused on adult experiences related to educational international experiences. While several aspects of these experiences may differ between the various groups (youth, college students, adults), some of the motivations for traveling abroad are similar including personal growth, increase in life skills, and gain in knowledge (Besili, Warner, Kirby, & Jones, 2016; Stone & Patrick, 2013). International experiences are found to contribute to an individual’s personal and professional growth by providing them with an in-depth understanding of global concepts and different perspectives regarding cultural differences.

The North Carolina Tobacco Trust Fund Commission Agricultural Leadership Development Program is a program designed for early and mid-career agriculturalists who demonstrate leadership within their communities and/or organizations. This group of 30 individuals is comprised mainly of farmers, but also includes various industry professionals and extension agents. Participants attend eight sessions focused on agricultural awareness, personal growth, and civic leadership in addition to a Washington, D.C. policy tour, United States domestic study tour, and an international study experience. The international study experience is a twelve day trip where participants learn about international agriculture, policy and trade, and cultural components. Following their participation in this two year program, participants typically go to lead within commodity organizations, community groups, and on state and regional committees. The international experience includes visits to farms, meetings with agricultural leaders, cultural components, field trips to museums and popular tour destinations, and international leadership lessons.

Purpose and Objectives
The purpose of this study was to determine the pre-perceptions and motivations of the agricultural leadership program participants to participate in a twelve day international travel experience. Objectives included:

1. Determine the current perception of skills gained, growth opportunities, and contribution to agricultural knowledge and leadership skills through an international study experience.
2. Determine challenges and fears related to the international study experience.
3. Determine importance and viewpoint of cultural awareness.

Methods
For this study, the researcher utilized survey research. Following a review of literature, a questionnaire was developed using Likert-type questions and open-ended questions to address the objectives of the study. The questionnaire was reviewed by program leaders who have experience traveling with adults on international study experiences. Suggested changes were
made and then the questionnaire was distributed via an email link with a follow-up email sent to non-respondents after two weeks. Twenty-two participants out of thirty participated in the study for a 73% response rate.

**Results and Conclusions**

The majority (18) of this unique professional group indicated that they have traveled internationally prior to this upcoming trip. Overall, participants viewed the international study experience as a potential positive contributor on both their personal and professional lives and agree or strongly agree that this experience will provide them with a greater understanding of global agricultural concepts, the agricultural industry, and an understanding of current challenges facing other populations. Everyone also agreed or strongly agreed that this experience will help them be a better leader, informed citizen, and agricultural advocate while providing them with an increased understanding of a different culture. A majority (15) strongly agreed and seven agreed that it is important to engage with other cultures with an even split between strongly agreeing and agreeing that they are comfortable with individuals from different cultures. They viewed potential relationships as a way to expand their agricultural knowledge. When asked about their interactions with individuals from different cultures, ten indicated daily interactions, seven monthly interactions, three yearly interactions, one rarely, and one not at all. Similar to the findings from Orndorff (1998), participants indicated fears related to family and job situations, language, and cultural differences while participating in the study experience, but look forward to experiencing a new culture and gaining a deeper knowledge related to cultural and global awareness.

**Recommendations**

Even though adults typically have more life experiences, it is important to have an understanding of their perceptions and fears prior to international study experiences. Program leaders should provide trainings and educational materials related to the country being visited so that participants have a basic understanding of the culture and country. Following the trip, a potential study related to their experiences would provide valuable feedback for future planning of trips for adult participants. Research shows that travel experiences provide many personal and professional benefits so when possible program leaders should seek out opportunities for international experiences.

**References**


Status and Practice of Small-Scale Coffee Producers in Nepal’s Tanahu and Lamjung District: An Extension Education Needs Assessment

Upakar Bhandari  
Agriculture and Forestry University  
Chandra Puri  
National Tea and Coffee Development Board  
Jeremy Elliott-Engel  
The University of Arizona

Review of the Literature

Sixty-six percent of the Nepalese population is involved in farming which contributes approximately one third of total GDP (Economic Survey, 2017). Arabica coffee (Coffea arabica L.) is a high-value crop cultivated on a commercial scale in hilly districts of Nepal (e.g. Tanahu and Lamjung districts). Coffee cultivation in this region has great potential due to the suitable climate (National Tea and Coffee Board, 2014).

The agricultural production, farm household income, and the national economy are affected by limited smallholder farmer production knowledge (Baloch and Thapa, 2017). Nepalese farmers have access to few research based production technologies. They are growing coffee with limited technical knowledge and do not use chemicals as fertilizers or plant protection measures (Kattel, 2015). Farmers produce organic coffee because farmers are either too poor to buy adequate inputs are they are unavailable when application is needed (Kattel and Paudyal, 2011).

The production of quality coffee can be enhanced through quality management during harvesting, processing, packing and storage. It is estimated that with appropriate development efforts production levels could be raised by 288 percent (Katuwal, 1999). Income and employment opportunities for farmers can be raised by increasing production, processing and marketing operation knowledge for sustainable coffee development (Karki, Regmi and Thapa, 2018).

Methodology

This study was initiated to assess coffee the status of small-scale coffee producers in Nepal. The research questions are:

1. Who are the small-scale coffee producers in Nepal’s Tanahu and Lamjung district?
2. What are the production challenges that producers identify?

The qualitative interview(n=70) was conducted in Nepali language. Participants were randomly selected from members of the locally established coffee cooperatives. The interview questions were informed by a district coffee production cooperative booklet (National Tea and Coffee Board, 2017), and a key informant survey that was conducted with participants with the district coffee cooperatives (n=3).

Three focus group were conducted with coffee farmer’s cooperative in the local communities representing three different cooperatives with the presence of fifty people (n=50). The focus group participants are unique individuals from the interview respondents. The data was collected and then coded into numeric values. The data was then compiled in Microsoft Excel and
STATA. Descriptive statistics were then conducted, from the collected data. Qualitative data were quantitized into discrete categories (Creswell, 1996).

Result and discussions

Demographics
Producers interviewed are 30 percent male and 70 percent female. The mean average age is 47 years old. Participants average family size is six (maximum eleven and minimum three). The family members conducting the production work (active age group) ranged from 15-59. Ninety seven percent of the respondents are literate and three percent illiterate. Woman had the highest percentage of participation in coffee cultivation (76 percent female and 24 percent male). Thirty percent of farmers have access and 67 percent of farmers do not have access to irrigation.

Status of Nepali Farmer’s Technical Coffee Knowledge
There is lack of technical knowledge with farmers on commercial coffee production and management. Forty eight percent farmers took the training on commercial coffee production. Some technical limitations are: geographical limitations for gaining knowledge and transporting products, well managed processing centers, and marketing are lacking in the study area. Cooperatives collect the fresh cherry from farmers and send them to the capital for processing. Farmers are less motivated for coffee production because of their lack of training.

White stem borer (WSB) (Xyloprechus quadripes). This insect is causing extensive economic damage (Khadge et al., 2003). Sixty-seven percent of the farmers observed the problem of WSB. Organic methods of combating these pests can be useful. However, producer knowledge is limited. Farmers currently use locally available red mud to control the WSB.

Shading trees in Coffee. Shade, a major requirement in the coffee plantation as either too thin or too thick will result in poor productivity and poor health. Intercropping under mandarin orchards is a general practice in Lamjung and Tanahu districts which work as shading to coffee plants. Shade trees generate natural mulch, reduce soil erosion, and improve soil fertility.

Conclusion
The primary approach to coffee production in Nepal is traditional and utilizes locally accessible resources. Extension programs need to be targeted at woman. Materials can be published due to the high rates of producer literacy. Published materials can be delivered far more widely than relying on in-person training. Investment is needed to develop locally relevant solutions to shading in traditional multi-cropping systems, and cost- and environment-responsive pest and disease treatment. Extension using a farmer-centered applied research model can contribute to both producer knowledge and the literature.

References


Introduction
In the quest for balance between increased food production and environmental protection, sustainable agriculture (SA) has become increasingly popular globally as a potential solution to this conundrum (Velten, Leventon, Jager, & Newig, 2015). In spite of its growing popularity, SA is not often taught in agricultural classes at the high-school level in the United States (Muma, Martin, & Shelley, 2010). The same is true for high-school students of agriculture in Nicaragua, although, a handful of non-governmental organizations have introduced SA practices in secondary schools in the region (Center for Development in Central America, 2013).

This study explores the perceptions of high-school students in agriculture classes in the United States and in Nicaragua regarding SA as a subject in the agricultural curriculum. Exploring this data will highlight students’ knowledge about, as well as attitudes toward, SA and will serve as a baseline for constructing curriculum in SA.

The Social Reconstruction Theory shaped this study (McNeil, 2006). The social reconstruction theory places schools and education at the center of political, social, and economic development. The theory advocates that individuals and the most pressing societal needs should be the main focus for curriculum development, teaching, learning, and evaluation (McNeil, 2006). Identifying how students view SA will help researchers craft appropriate curriculum for high school students.

Purpose and Objectives
The objective of this research study is to observe high school students’ knowledge of and attitudes towards SA. It is intended to compare the knowledge and attitudes toward SA of students in Texas and students in Nicaragua. The three objectives that shaped this study were:
1) Describe secondary students in Nicaragua and Texas based on their general and perceived knowledge and attitudes toward SA.
2) Compare students in Nicaragua and Texas based on their general and perceived knowledge and attitudes toward SA.
3) Identify the self-perceived educational needs of students in Nicaragua and Texas.

Methodology
For this quantitative study, the population (N=400) consisted of high school students from Bexar and Lubbock Counties in Texas and high school students participating in rural high-school programs in Madriz and Nueva Segovia provinces in Nicaragua. Students completed an instrument developed by researchers asking their knowledge of and attitudes toward SA. The instrument was comprised of five constructs: 1) students’ general knowledge of SA, 2) students’ perceptions of the value of SA, 3) students’ perceived benefits of SA, 4) students’ perceptions of the importance of SA in curriculum, and 5) students’ perceptions of methods and techniques for
teaching SA. The instrument was tested for reliability and validity in both English and Spanish prior to data collection. Alpha levels for the English version ranged from .87 - .95; Spanish version alpha levels ranged from .86 - .94. Data were analyzed using descriptive statistics, independent T-tests, chi-square, and Witkin’s needs assessment matrix.

Results and Conclusions
Data has been collected in Nicaragua and is being collected in Texas. Full analysis will be completed before November of 2018, but initial data analysis indicates that Nicaraguan students have more general knowledge of SA than students in Texas. Conclusions and recommendations will be provided upon completion of the data collection and analysis in November.

References
Explaining the Brain Drain: Intentions of Youth Migration in Chalatenango, El Salvador

Amy E. Boren Alpízar
Rafael Quijada
Carla Andrea Millares Forno
Texas Tech University

Introduction
Individuals under the age of 25 comprise the demographic group that is most willing to engage in migration (Global Migration Group, 2014). In developing countries, the influx of rural migrants to urban centers places unsustainable demands on their infrastructure and economy (UN Department of Economic and Social Affairs [DESA], 2011). Migrants often find themselves exploited in urban centers, particularly if they are young (UN DESA, 2011). The socio-economic factors which impel rural dwellers to migrate have been studied in adult populations but are just beginning to be explored among youth (Chisinga & Chasukwa, 2012; Ango, Ibrahim, Yakubu, & Usman, 2014; Bednarikova, Bavorova, & Ponkina, 2016).

Youth migration in El Salvador is a well-known problem. Previous research indicates one in four young people desires to migrate to the United States and one out of every five people who migrate is young (Gaborit, Zetino, Briosso, & Portillo, 2012). Though youth migration is an important issue, there are few studies focused on the causes of migration and the impacts of youth programs on the decision to migrate (Roth & Hartnett, 2018).

This study is framed by the Theory of Planned Behavior (Ajzen, 1991). This theory focuses on people’s intentions to act based on their attitudes, subjective norms, and perceived control over the act.

Purpose and Objectives
The purpose of this research study is to explore the push/pull factors in the intentions of rural youth in Chalatenango, El Salvador to migrate from their communities to urban centers. The research questions answered were:
1. Do agricultural youth programs have an impact on youth’s decision to migrate?
2. What are the push/pull factors that influence youth to migrate from their rural communities to urban centers?

Methodology
For this quantitative study a two-group design was used. Researchers recruited high school students with similar economic and social characteristics in Chalatenango, El Salvador to participate in the study. One group participated in a formal agricultural education program (n=50) and the other group was not part of an agricultural education program (n=50). A 7-construct instrument developed and pilot-tested by the researchers was given to the students. Reliabilities for the constructs ranged from .74 - .89. Descriptive statistics were performed to detail the demographic characteristics of the groups and Factorial Analysis of Variance (ANOVA) was conducted to highlight the differences between groups in the different constructs.

Results and Conclusions
Migrating to urban centers is a popular option in the plans of many young people in El Salvador. Seventy-three percent of the participants intend to migrate from their rural communities and 53% plan to leave their communities indefinitely. While the majority of the rural youth expressed intentions to migrate, results indicated that youth who were part of the formal agricultural program had stronger intentions to migrate than the other group ($p < 0.05$).

Results from the Factorial ANOVA indicated the constructs of “Access to Extension Activities,” Social Support,” “Environmental Impacts,” and “Migration Intentions,” were significantly different ($p < 0.05$). Youth who are part of formal agricultural programs indicated that these four constructs had greater influence on their decision to migrate. Youth without formal agricultural education indicated that the constructs “Social Participation” and “Subjective Expectations.” had greater influence on their decision to migrate ($p < 0.05$).

**Recommendations**

Young people engaged in formal agricultural training had stronger intentions to migrate than young people without such training. Results suggest that young people in agricultural education programs do not view themselves as having access to the technical and social support they need to be successful in their home communities. This provides an opportunity for youth agricultural education programs to examine their curriculum and teaching methods to see how they can address these gaps. Additionally, environmental factors – such as drought – also played a key role in youth’s intentions to migrate. Exploring innovative solutions to environmental problems could also prove fruitful in helping youth to see opportunities to thrive in their home communities.

Young people not engaged in agricultural education intend to migrate based on the opinions of significant others and their own beliefs that their lives will improve if they relocate to an urban center. Engaging these young people in entrepreneurial activities and helping them to see their communities as places where they can thrive will be key in a retention strategy.

Qualitatively exploring rural youth’s intentions to migrate to urban centers could provide valuable insight into the issue. We recommend expanding the quantitative study to other regions of El Salvador and following up with qualitative inquiry into the motivations of rural youth to leave their home communities.

**References**


Globalization of food and agriculture is taking place more than ever before due to improved communication and fast moving transportation of agricultural commodities across the globe (FAO, n.d.). Globalizing agriculture demands for a globally competent workforce with international experience and understanding (Acker & Scanes, 1998). Universities use international visitor exchange programs as a mean to help students gain international experience in another country (Messer & Wolter, 2005). Extension services, development organizations, and faith-based organizations also promote international visitor exchange programs. For example, the Cooperative Extension uses the international youth visitor exchange program to facilitate the US youths to gain international experience (Sallee & Lancaster, 2013). It also provides an opportunity for incoming youths from other countries to have an international experience in the US. It is a win-win program for the youths in the US as well as youths coming from other countries. These exchange programs are considered as a strategy to lay a foundation of understanding others (AIFS, n.d.). Planning and implementation of a successful international visitor exchange program is a challenging task that involves coordination of many responsibilities. The focus of this study is to understand the task of international youth visitor exchange program from Extension Agents’ perspectives for planning better programs.

Purpose and Objectives
The purpose of this study was to determine the barriers, challenges, and alternatives for planning international youth visitor exchange programs through Cooperative Extension. More specifically the study aimed to find answers to the following questions:

1) What are the major barriers when planning international youth visitor exchange programs?
2) What are the major challenges when planning international youth visitor exchange programs?
3) What are the best alternatives to overcome barriers and challenges when planning international youth visitor exchange programs?

Methods
Three-round modified Delphi technique was used to collect the needed data to find answers to research questions from a panel of experts comprised of 21 Extension Agents in North Carolina and Virginia States. These 4-H Extension Agents were selected based on their past and current experience in international youth visitor exchange programs. Delphi technique is effective in reaching consensus among the group of experts selected purposively (Stufflebeam, McCormick, Binkerhoff, & Nelson, 1985) for finding useful information (Hue & Sandford, 2007). “It aims to guide group opinion towards a final decision and to answer questions through triangulation of subjective group judgments, analytical techniques and the experience of the researcher” (Cantrill, Sibbald, & Buetow, 1996, p. 67). We used the Qualtrics online program to gather data. We asked
the following three questions at the first round from the Delphi panel. 1) What are the major barriers you faced when you plan an international youth visitor exchange program? 2) What are the major challenges you faced when you plan an international youth visitor exchange program? 3) What are the alternatives to overcome those barriers and face challenges? Twenty panel members responded to the first round. The first round resulted a unique list of 16 barriers, 26 challenges, and 37 alternatives. Nineteen panel members responded to second and third rounds. We used both rounds to build the consensus and identified the items rated as agree or strongly agree by 2/3 of the respondents.

**Results and Conclusions**

The Delphi study led to build the consensus among the panel for seven barriers, 17 challenges, and 25 alternatives. Finding families that are willing to take the responsibility of hosting a delegate from another country for the duration needed and lack of time to devote full attention for the program due to other extension commitments of the agent were the two most important barriers. Finding another host family when a placing of an international student does not work out with the originally assigned host family was the greatest challenge. Having some agents who have been through the process to mentor agents that are new to this program when planning and implementing the program was identified as the most important alternative by the panel unanimously.

**Recommendations and Implications**

Extension Agents planning an international youth visitor exchange program should be aware of potential barriers, challenges, and practical alternatives identified in this study for planning successful programs. Being aware of alternatives, Extension Agents will be able to overcome barriers and face challenges realistically. Findings of this study are very specific to the US context. However, there are some barriers, challenges, and alternatives identified in this study have practical applications for any country situation with international implications.

**References**


The Adoption Potential of Agricultural Education Curricula for Girls in a Rural Ugandan Empowerment Project

Mitchell Baker
Robert Strong Jr
Texas A&M University

Introduction and Theoretical Framework

Uganda hosts 1.2 million refugees who have fled from South Sudan, the Democratic Republic of Congo, Burundi and others, more than any other nation in Africa (World Food Program, 2017). This complicates agricultural production in Uganda, as smallholder farmers lack knowledge or access to basic services such as handling techniques, storage facilities, insurance and other vessels that help sustain successful, food-secure farms and households (Food and Agriculture Organization of the United Nations, 2018). Roberts and Edwards (2017) reported Ugandan farmers lack fundamental agricultural information to develop solutions for food security issues.

The Girl Power Project (GPP) is an existing girl’s empowerment program developed by the Just Like My Child Foundation (JLMC) in rural Uganda that empowers girls to improve the wellbeing of their families and communities through the teaching of life skills and mentoring training (Just Like My Child, 2018). The program reaches over 40 schools and communities in central Uganda. All stakeholders of these communities have a close tie to agriculture as a livelihood. Ajzen’s (1991) theory of planned behavior stated that intentions to perform behaviors of different kinds can be predicted with high accuracy from attitudes toward the behavior, subjective norms, and perceived behavioral control.

Purpose

The purpose of this study was to investigate the feasibility of this possibility by gauging GPP graduates’ faculty, interest level and perceptions of agriculture as a potential career.

Methods

This study utilized a case study design to understand the participants and context (Dooley, 2007). Denzin and Lincoln (2005) described three conditions to a case study: first, the subject is studied in multiple ways, second, the findings are composed of intensive detail, richness, depth of observation and notes, and thirdly, the case is seen in “the big picture” as a whole over an extended period of time. More time provides more context and thus more validity to the case study (Denzin & Lincoln, 2005).

The purposive sample of this study are 47 female graduates of the GPP that continue to participate in after-school GPP-organized club sessions as “GPP mentors” (Clinton Foundation, 2016). Data was collected from May to July in 2018 via conducting semi-structured interviews alongside a team of three other student researchers. An audit trail was maintained in effort to ensure confirmability, a thick description was captured for possible transferability, and credibility was ensured by triangulating between United Nations Sustainable Development Goals, archival JLMC data, and member checking. Constant comparative data analysis was initially implemented to analyze the data collected (Glaser, 1965). Open coding was then executed in order to form categories (Tesch, 1990). After open coding, axial coding analysis
built cumulative knowledge between newfound categories and subcategories. Finally, selective coding was used to create core themes used by the researcher to achieve the purpose of the research.

**Results**

The analysis of data revealed two major themes: GPP mentors want to pursue agriculture as a potential career because (a) of their desire to provide a better livelihood for themselves and their families, and (b) the potential agriculture holds as an opportunity for income generation. Mentors indicated feeling confident in their current agricultural faculty, in part due to prior experiences growing food with and for their family throughout their childhood and young adult life. Although some students identified negative stereotypes concerning agriculture perpetuated by Ugandan society similar to stereotypes Roberts and Edwards (2017) noted as reasons not to pursue agriculture as a career, \( (n=47) \) 83% of respondents indicated overwhelmingly their desire to receive agriculture education as a part of the GPP curricula continuum. This is due in large part to important stakeholders of respondents’ lives such as family, fellow mentors, and peers also wanting to gain agriculture knowledge and skills to better their livelihood and income.

**Recommendations and Educational Importance**

The subjective norms (Ajzen, 1991) were favorable toward pursuing agriculture as a career because of the livelihood improvements their efforts may yield for themselves, as well as their present and future families. Because GPP graduates perceive important stakeholders in their lives approve of their desire to engage in agriculture education, they are more likely to actualize that behavior (Ajzen, 1991).

Practitioners and researchers can connect this study strongly to the 2019 AIAEE conference theme. Linking agriculture with the needs of the girls living in rural communities of a developing nation could empower educators to find more opportunities for innovation, all the while motivating and engaging the most oppressed demographic to find more faculty, autonomy and ultimately empowerment as a result of their newly experienced education.

**References**


School-based, Agripreneurship Projects (SAPs) that Integrate Youth-Adult Partnerships: The Experiences of Student (Youth) Partners in Uganda

Stephen C. Mukembo, Ph.D.
M. Craig Edwards
Craig E. Watters
J. Shane Robinson
Jon W. Ramsey
Oklahoma State University

Introduction
Youth-Adult Partnerships (Y-APs) have been instrumental in helping youth engage in community initiatives and in bridging the gap between youth, adults, and other stakeholders (Libby, Rosen, & Sedanaen, 2005). Partnerships play an important role in the growth and development of community-based, livelihood programs, including youth development to build their capacity to bring about desired changes (Akiva & Petrokubi, 2016). Examples include 4-H youth programs, boys and girls clubs, and other youth leadership development initiatives (Camino, 2000). The interaction between youth and adults is mutually beneficial, and both parties learn from one another (Camino, 2000). Therefore, integrating such partnerships into school-based, agripreneurship projects (SAPs) could help equip students (youth) with livelihood skills and contribute to economic development (Mukembo, 2017).

Theoretical Lens
To ensure credibility and transparency in their studies, researchers employing naturalistic inquiries, including phenomenology, ought to work from findings to theory (Guba, 1981; Lester 1999). To this end, the theory of experiential learning, as espoused by Kolb (2014), emanated from the themes and essence of this inquiry.

Purpose
This phenomenological study (Moustakas, 1994) sought to explore and derive meaning from the students’ experiences regarding SAPs involving interactions with adult partners, including the potential of such to improve agricultural practices and livelihoods. As part of a larger investigation, this portion was guided by one overarching question: What were the students’ experiences regarding their SAPs that involved interactions with adult partners?

Methods/Data Sources
This investigation employed a phenomenological approach to explore “the nature and meaning of [the students’ shared] experiences” (Van Manen, 1990, p. 9). Senior Two students from two boarding high schools in Uganda raised broilers as their SAPs. They received training on entrepreneurship and poultry science from agriculture and entrepreneurship teachers, extension educators, and poultry farmers, i.e., the study’s adult partners. Data were collected from 22 students (10 boys and 12 girls) purposively selected and interviewed via Skype (Deakin & Wakefield, 2014) using open-ended questions (Patton, 2015). Other data sources, including journal entries, video recordings, and training materials were analyzed to triangulate the study’s findings (Patton, 2015). Tracy’s (2010) eight tenets of qualitative research were employed to ensure high quality methodology and an ethical study. Transcription was verbatim (Yin, 2010).
Interview data were coded and analyzed using NVivo 11 analysis software (QSR International, 2013, 2016); seven themes and 23 subthemes emerged.

**Results/Conclusions**

Four of the study’s themes and its essence (Moustakas, 1994) are described here.  

**Theme #1: Understanding poultry science and related management practices, including brooding, hygiene, and disease prevention in the flock.** Students indicated the acquisition of knowledge, skills, and a better understanding of poultry science, was enhanced by working with adults through their SAPs. One participant shared:  

I learned to vaccinate the birds. I did not know that you put a drop on an eye, so they [adults] told us to draw vaccine into the syringe and put a single drop on the eyes which was quite interesting.

**Theme #2: Awareness about agripreneurship and entrepreneurship in general, including opportunity recognition and idea generation relating to agriculture, as well as the role of agripreneurship in community development.** Adults helped students become more aware of agripreneurship and its contribution to community development through job creation, improving food security, expanding industrial development, and increasing local revenue.

**Theme #3: Acquisition of technical skills related to business development and management.** Adult participation also helped students acquire skills on how to generate ideas and recognize business opportunities, writing business plans, accounting, budgeting, as well as creating marketing and financial plans.

**Theme #4: Acquisition of life skills.** By working with adults, the students acquired a variety of life skills that they hoped would make them better citizens in their communities. Such included communication, conflict resolution, leadership, mobilization, teamwork, networking, and socialization.

The essence distilled from the students’ experiences regarding their SAPs was learning by doing, as enhanced by key partnerships with adults in their communities.

**Recommendations/Educational Importance/Implications**

A need exists to provide an enabling environment to promote an agripreneurial culture among students to combat youth unemployment in Uganda. This could be done by establishing idea incubation sites at the schools, and connecting students with adults in their communities willing to provide mentorship through partnerships (Camino, 2000; Zeldin & Petrokubi, 2008).

Longitudinal studies should be conducted to determine the long-term effectiveness and impact of Y-APs on improving youth livelihoods, including equipping them with life skills to become better citizens. Such investigations could involve cohort or panel studies (Creswell, 2012).

**References**


African Entrepreneurs’ Views on Youth Empowerment: The Influence of a U.S. Fellowship

Richie Roberts  
Adam M. O’Malley  
Louisiana State University  
M. Craig Edwards  
Craig E. Watters  
Oklahoma State University

Introduction/Conceptual Framework
Youth empowerment is of primal importance to Sub-Saharan Africa’s (SSA) continued development (Blum, 2007). In 15 SSA countries, more than 50% of the population is under age 18 (FAO, 2014). Development approaches such as the U.S. Department of State’s Mandela Washington Fellowship (MWF) have been introduced to empower youth in SSA. In 2018, 700 young SSA professionals (Fellows), ages 25 to 35, engaged in six-week-long MWF Institutes (MWFI) at 28 U.S. universities. Oklahoma State University hosted 25 Fellows from 20 countries for an Institute featuring business and entrepreneurship (B&E). Most were agricultural and food entrepreneurs. The Institute also engaged Fellows in sessions on youth issues. Roberts, Smith, Edwards, and Watters (2018) previously reported this approach yielded three distinct perspectives on youth empowerment: (1) Youth Energizers, (2) Youth Advocates, and (3) Youth Visionaries. More evidence was needed, however, to understand whether these perspectives were consistent over time and across Fellows. The capacity-building described is supported by human capital theory (Schultz, 1961) and the theory of planned behavior (Ajzen, 2001).

Purpose
This study’s purpose was to corroborate earlier findings (Roberts et al., 2018) by assessing the influence of a 2018 MWFI on participants’ perspectives about youth empowerment.

Methods/Data Sources
This was a Q method study. Q is used to understand participants’ holistic perspectives on a phenomenon (Brown, 1980). Individuals’ sorts are correlated with one another and the data are reduced to arrays through factor analysis. Thereafter, researchers use a naturalistic approach to interpret the arrays and expound on the participants’ collective views.

At the core of Q is concourse theory. A concourse reflects the scope of participants’ perspectives on a phenomenon using statements (Watts & Stenner, 2013). This study used the 36 statements developed by Roberts et al. (2018), which resulted from an in-depth qualitative analysis and were interpreted through The Kellogg Foundation’s (2007) collective leadership framework (CLF). Fellows sorted the statements on a quasi-normal distribution curve ranging from -4 to +4. Their sorts were then uploaded to PQ Method® version 2.35 (Schmolck, 2014). Using PQ Method®, we performed three statistical tests: (a) correlation, (b) principal components factor analysis, and (c) computation of factor scores. Using Varimax rotation, we chose a four-factor solution with a base significance of .44 because it captured the largest number of Fellows, i.e., 23, 51% of the total variance, and yielded negligible correlations among the factors. Following Mauldin’s (2012) suggestions, we also analyzed the Fellows’ personal characteristics, distinguishing and consensus statements, factor loadings, and qualitative responses to interpret the factors.
Results/Conclusions
Interpretation of the data yielded four factors: (1) Youth Energizers, (2) Youth Visionaries, (3) Youth Organizers, and (4) Youth Educators. Eight Fellows, equally male and female, loaded significantly as Youth Energizers. From the Youth Energizers’ perspective, the Institute helped them understand how to use B&E to inspire youth (34, +4) and other marginalized populations (32, +4) by identifying solutions to local problems (19, +3). Youth Visionaries, a male-dominated perspective, perceived the Institute enlightened them on the importance of youth in SSA (30, +4) and, perhaps, reshaped their focus for the future (21, +4).

The Youth Organizers maintained the Institute helped them understand how to build teams (18, +4) of diverse members (12, +4). And by establishing a cohesive team (17, +3), they expressed being poised to enact change (21, +3) and confront youth issues in their communities. The final perspective, Youth Educators, articulated that the Institute assisted them in understanding the role of building professional relationships (18, +4) and using such connections to improve the education (25, +3) of youth so they could navigate the complexities (6, +3) of SSA.

Implications/Recommendations/Educational Importance
Findings suggest the Institute positively influenced the Fellows’ perspectives on youth empowerment. In comparison to the findings of Roberts et al. (2018), as derived from a 2017 MWFI, two additional perspectives – Youth Organizers and Youth Educators – emerged, but another did not. Perhaps the reason for this difference is because more diversity existed regarding participants’ countries and likewise their socio-cultural norms. The findings provide valuable insight (Mammino, 2011) for the development literature and providers of similar programs in regard to highlighting effective strategies to help African entrepreneurs gain a greater commitment to youth empowerment, implying behavioral change (Ajzen, 1991) and the building of human resources (Schultz, 1961). During the Institute, Fellows interacted directly with American youth and/or their advisors through several coordinated activities – 4-H and FFA – and reflected on how they could use similar programming to positively influence youth. We recommend that similar capacity-building projects consider including these approaches.

References
Sustainable Harnessing of Agricultural Technologies among Smallholder Farmers in Western Kenya

Newton M. Nyairo
Mark Tucker
Mark Russell
Linda Pfeiffer
Purdue University

Background and Objectives
Scaling up use of agricultural technologies among smallholder farmers is key in unlocking the slow agricultural growth that smallholder farmers experience in developing countries (Doss et al., 2003; Suvedi et al., 2017). Adoption of improved farming techniques and the application of modern practices are necessary in leading to the improvement of agricultural output and harnessing overall production efficiency gains. Channels of communicating agricultural innovations to farmers are a necessary determinant in the spread and adoption of those practices among smallholder farming communities in developing countries, where the adoption rate of new agricultural practices and technologies is currently lower compared to efforts made towards their promotion. Increasing the adoption of new agricultural practices among smallholder farmers in developing countries preoccupies all agricultural development stakeholders (Doss et al., 2003). Applying the adoption of innovation theory, this study assessed factors influencing farmers’ behavioral intentions to adopt agricultural technologies among smallholder farmers in Kakamega County, Kenya.

Study Design
The theoretical framework follows Rogers (2003), where diffusion of innovation is defined as a process in which an innovation is communicated through certain channels over time among members of a social system. For a study such as this that seeks to understand individual farmer decision-making processes, focus group discussions (FGD) gave way to a deeper understanding of the investigation of how farmers make adoption decisions. This allowed the study to identify the impediments to agricultural extension efforts to promote technology use among smallholder farmers in the region.

Participants in the study
The research data (N=78) were collected in June and July 2018 by randomly selecting smallholder farmer household in Kakamega County, Kenya. Participating households were from seven out of the 12 sub-counties of Kakamega County, Kenya. Farm sizes for participating households did not exceed 3 hectares. The main respondent from each households was the household head.

Summary of Methods
The study applied a mixed methods design to estimate factors influencing agricultural technology uptake among smallholder farmers. A logistic regression was estimated to determine the factors that influence the adoption of new agricultural technologies, as well as other modern
agricultural practices. The model innovates by utilizing farmer intentions as one of the explanatory variables, in addition to conventional demographic ones.

**Results**
The results are consistent with the theory of adoption of innovation. Farmer intention to apply new agricultural practices tend to be based on the prevailing agro ecological zone. Some demographic factors, such as level of education, directly influence the adoption of agricultural practices.

**Conclusions and Recommendations**
The study found some links between demographic factors and the adoption of agricultural technologies. Membership in farmer groups was significant in determining agricultural technology adoption, also evident in Cavanagh et al. (2017). Thus, it is important to promote and strengthen local farmer networks. Adoption of innovations needs to be incorporated into smallholder agro-economic systems by developing a better understanding of the technology needs of farmers and fostering effective communication.

**References**
Journey Mapping in International Extension: A Proposition for Innovative and Participatory Monitoring and Evaluation

Colby J. Silvert  
Laura A. Warner  
John Diaz  
University of Florida

Introduction
Globally, modern extension is tasked in developing contexts to extend beyond technical interventions and address social issues (Jones & Garforth, 1997; Suvedi & Kaplowitz, 2016). Correspondingly, monitoring and evaluation (M&E) of extension programs should integrate appropriate tools and metrics to assess social influences on livelihoods and farmers’ outcomes, appreciating possibilities for social and technical correlations.

Journey mapping is predominately used as a commercial retail research technique to document the different steps or stages in a journey consumers may undertake before purchasing a product or service (Crosier & Hartford, 2012). By allowing researchers to systematically track client experiences, journey mapping develops personal narratives of clients’ journeys, decision-making, and physical and emotional responses at key points in the progression (Panzera et al., 2017).

Using household methodologies, extension professionals address smallholder farmer gender disparities and illustrate correlations with farm management and economic outcomes using capacity building and visioning tools (Farnworth et al., 2018). Although initiated before an action, this approach resembles the journey mapping process of creating a visual map to analyze behaviors and experiences of clients. We propose journey mapping could be used by international extension professionals as a participatory M&E tool, providing a unique opportunity to analyze how social and technical interventions at key stages in a farmer journey influence outcomes. Farmers could benefit firsthand by constructing and analyzing visual depictions of the steps, barriers, and decisions leading to their outcomes.

Purpose and Objectives
This proposition aims to learn from other sectors to test journey mapping as a participatory M&E technique. The purpose of this exploration is to evaluate extension programs’ technical and social interventions by facilitating construction of visual journeys with smallholder farmers to infer how key decisions, responses, and interactions at defined stages influence programmatic outcomes.

Methods and Data Sources
Journey mapping is underutilized in extension contexts, and we have summarized data collection approaches based on variations in the literature. We suggest integrating journey maps into a program not exclusively at the post-evaluation stage, but also at key milestones, such as a farmer’s first harvest with a fish farming program. This would allow the extension professional to make early programmatic refinements and facilitate reflection by farmers on their outcome(s) to encourage improvements.
Researcher(s) should first identify the programmatic goal (or research question) of the journey map(s) and decide key stages to examine. To evaluate social and technical interventions, a journey map could be used to describe effects of farmer involvement in gender and technical trainings leading up to their first fish harvest. During data collection, farmer participants would contribute qualitative data points (called touchpoints) within each stage, including key decisions, actions, perceived barriers, and emotional status. Facilitators should engage farmers using visuals and interaction.

**Results and Products**

We will present an example from the Sierra Leone Scaling up Aquaculture Production (SAP) project, which aims to increase smallholder farmers’ fish production, develop an aquaculture value chain (WorldFish, 2017), and support staff and farmers to reduce gender gaps (Silvert, 2017). An example SAP gender exercise was visioning on how to optimize farming households’ fish pond’s performance and promote gender equity in areas such as division of labor (i.e. fish feeding or harvesting) and income related decision-making.

As productivity was measured for the first fish pond harvests, in our proposition, households could be selected for journey mapping based on their varying harvest outcomes (i.e., good or poor harvests). In construction of journeys, along with technical data, gender-related touchpoints could be used to infer whether social-technical correlations may exist that impacted harvest outcomes. For example, a household may have developed a labor-sharing strategy that dually involved a husband and wife, and therefore the fish pond received more attention.

Finally, program benefits from integrating journey mapping could include gaining valuable data, capacity building for farmers, and success stories and communications that could be developed on farmer journeys.

**Implications and Application**

This proposition posits journey mapping as an innovative and efficient M&E technique to capture data and correlations often outside of the scope of standard evaluations. Moving beyond exercises such as the household methodology to link social transformation with farm economic and technical outcomes, journey mapping would involve farmers as coresearchers uncovering social and technical factors affecting development outcomes.

Participatory and integrated approaches are integral to an effective extension system (Lindner & Dolly, 2012). Journey mapping should be tested for its evaluation and farmer learning potential. Implications may include improved project design and M&E plans to reduce program-participant disconnect, facilitate a responsive and participatory system, and create and share farmer journeys and success stories.

**References**


Planning Change: A Case Study on Cooperative Extension’s Contribution to Creating a Culture of Continuous Improvement in Educational Programs

James C Anderson II  
University of Georgia  
Eric Kaufman  
Dana Ripley  
Carol Cash  
Timothy Guy  
Jama Coartney  
Shreya Mitra  
Virginia Tech

Introduction/Purpose/Conceptual Framework
Over the decades, the US Federal Government has invested billions of dollars, intellectual resources, and human capital to assist partners globally with addressing challenges related to development and human welfare. This support has reached across many sectors, including agricultural and food security, human rights and governance, health, water and sanitation, and education (USAID, 2018). Accordingly, federal agencies have sought efficient models for accomplishing the work in light of an increasing world population relying on finite resources.

The purpose of this case study is to present a framework employed by a team of Extension and Education Specialists to work with the US Department of Defense Education Activity (DoDEA) instructional leaders to develop a process for continuous improvement within their schools spanning 9 states and US territories as well as 11 countries in Europe and Asia. The goal of this effort is to equip DoDEA educators with the knowledge and skills needed to effectively prepare students to enter the supply pipeline as skilled workers through a college and career readiness curriculum. The improvement planning framework emerged by drawing from a variety of leadership theories and practices that focus on change and improvement (Dufour, Dufour, Eaker, & Many, 2006; Forman, Stosich, & Bocala, 2017; Kirkpatrick & Kirkpatrick, 2016; Park, Hironaka, Carver, and Nordstrum, 2013). The themes for the continuous improvement framework are: 1) a focus on purpose; 2) a recognition of change as a continuous and complex process; 3) utilizing data-based practices, structures, and systems; 4) capitalizing on relationships and professional collaboration; and 5) building capacity.

Project Methods
Guided by the five points of the continuous improvement framework, the project team, in close collaboration with DoDEA leadership, developed face-to-face and virtual professional learning activities and offered them over the course of a two-year period to instructional leaders that made up the three regional (i.e., Americas, Europe, and Pacific) Centers for Instructional Leadership (CILs), a newly developed instructional support structure for DoDEA school administrators. These activities included job-embedded learning, research-grounded implementation, follow-up support, and supplemental job-aids related to developing professional learning communities and implementing transformative coaching in order to create a culture of continuous improvement in schools. After implementation of the professional learning for CIL personnel, a content document analysis (Hodder, 2000) was conducted to evaluate the fidelity of implementation of
the continuous improvement framework. The documents used in the analysis were key procedural documents, meeting notes, and personal communications between the project team of specialists and DoDEA.

**Project Outcomes**

According to the documents analyzed, **purpose** is the driving force of the organization; it is the overarching goal that informs improvement initiatives. DoDEA developed and used Community Strategic Plans (CSPs) to coordinate and communicate their overarching purpose and initiatives towards that purpose throughout the organization. Additionally, the current CSP **focuses on change as a continuous and complex process** by highlighting the progress being made and explicit next steps in the change process, specifically related to changes to the organization’s Vision and Core Values.

In order to assist with this systemic process of change, the CILs have received professional learning on focused collaboration and transformative coaching, which they have begun to roll out **data-driven practices, structure and systems that support continuous improvement** globally based on the organization’s stated priorities, stakeholder needs, and assessment data. Additionally, the CILs help to create consistency with the implementation of strategic initiatives that **build capacity** of instructional leaders throughout the three regions by **capitalizing on relationships and professional collaboration** both internal and external to DoDEA.

**Implications**

While continuous improvement is not new to education or international development initiatives, implementing it with fidelity in various contexts remains difficult (Park et al., 2013). The 5-point framework presented in this case study is based on current literature in the field of leadership development and education and provides the necessary components that Extension Specialists can implement when planning and facilitating continuous improvement in international education and training programs. DoDEA serves as an adequate case to explore this framework because it operates schools worldwide and as a result of being exempted from the educational mandates of US public schools, has removed levels of regulation that often impact change and improvement efforts in those schools. To this end, we believe that the framework is readily transferable to a variety of different contexts making it a feasible innovative model for Extension Specialists to use in international settings to create a culture of continuous improvement.

**References**


Strategies to Alleviate Food Insecurity in Kenya: A Delphi Study

Carla Andrea Millares Forno
Raphael Gikunda
Millicent Oyugi
Amy E. Boren Alpízar
Texas Tech University

Introduction
Food insecurity is a persistent challenge in the developing world, particularly the Sub-Saharan African region (Adden, 2017). In Kenya it is a cause for concern because more than 3 million people are food insecure with majority of them living on food relief (Welborn, 2018). The current food insecurity problems are attributed to several factors, such as frequent droughts in most parts of the country, high costs of domestic food production, and high costs of inputs (International Food Policy Research Institute [IFPRI], 2012). Furthermore, the country’s population has been growing while agricultural production has been declining, which is a cause of concern in the country (United States Agency for International Development [USAID], 2018). As a result, the most vulnerable populations from the arid and semi-arid regions often adopt strategies to cope that are ultimately destructive, such as selling their only assets, withdrawing children from schools, and undertaking income-generating activities that damage the environment (World Food Program [WFP], 2018).

Food security is measured based on four pillars: availability, access, utilization. As a result, there is not a single solution to achieve it, and there are many strategies that can be used (Food and Agriculture Organization of the United Nations [FAO], 2009). The Kenyan government, in-country organizations, and international institutions have developed many strategies to reduce food insecurity such as: improving the access to markets, increasing the nutritional status and the access to water, building resilience of vulnerable communities, and increasing the agricultural capacity of the country (USAID, 2018; and WFP, 2018). Although these strategies may be useful in addressing food insecurity, it is not known which among them would be more effective, a gap that this study was set out to address.

Purpose of the Research
The purpose of this research was to identify the most effective strategies that can be adopted to address food insecurity in Kenya.

Methods
The Delphi technique is a broadly accepted method used to gather consensus among experts on a specific topic (Hsu & Sandford, 2007). This technique has been used in a variety of disciplines and it is an effective way to achieve consensus without having the experts in the same geographical location (Vernon, 2009).

A two-round Delphi study was performed with 28 international experts who agreed to participate. Experts represented several universities, governmental, and non-governmental organizations in Kenya. In the first round of the study, panel members were asked via email to answer a single question: “Which are the most important topics that need to be addressed in
order to achieve food security in Kenya?” Based on the responses, topics were grouped into categories based on their similarity. A five-point Likert-type instrument was developed in order to rank the topics from Extremely Effective (5) to Not Effective (1). The instrument was sent to the experts for a second round. Responses were then weighted and consensus for inclusion was considered to be reached when at least 80% of the panel considered the practice effective.

**Results**

The result was a list of strategies ranked by level of perceived effectiveness in order to successfully achieve food security in the country. Experts proposed 69 strategies in round one; 15 strategies were eliminated due to lack of consensus by the panel. The highest rated strategies in order of their effectiveness were *increased access to produce markets, combat corruption, increase water conservation strategies, increase water availability, construction of water harvesting structures, review the taxes on farm products, improvement and expansion of marketing facilities, eradicate poverty, adoption of disease tolerant crop varieties and breeds of livestock, construction and maintenance of roads, improved access to inputs).*

**Conclusions and Recommendations**

The purpose of this study was to provide a list with topics that Kenyan food security experts consider effective. These resulting topics can be used to inform the framework for future interventions in the country. Having a variety of strategies in the country is important for solving the problem holistically. Although many initiatives proposed by the experts are already being utilized on a small scale, there is need for expansion, dissemination and adoption in most parts of the country. Future studies can be developed to analyze the effectiveness of the food security programs that are being currently executed, and to assess the feasibility of the initiatives that have not yet been implemented in the country.

**References**


