Poster Abstracts from the 2018 Annual Conference of the Association for International Agricultural and Extension Education .................................................................................................................. 7

A Critical Exploration of the Transformative Discourse of 4-H Youth Development in International Contexts .................................................................................................................. 8

A Hands-on Approach to Training International Development Workers in Sustainable Tropical Agriculture appropriate to Small-Scale Farmers .................................................................................................. 11

A Paradigm in Assessing Community Needs .................................................................................................................. 13

Advancing Use of Appropriate Farm Mechanization Adoption Among Small-Scale Malawian Farmers .................................................................................................................. 15

Agricultural Literacy at the Intersection of Human, Natural, and Cultural Systems Introduction and Review of Literature .................................................................................................. 18

An Expertise-Oriented Evaluation of Development Agent Preparation in Ethiopia .................................................................................................. 21

An Overview of Urban Water Conservation Practices in Selected Countries .................................................................................................. 23

Building the Teaching Capacity of African Plant Breeding Program Faculty through E-learning resources and a Communities of Practice .................................................................................................. 26

Comparing African Student Perceptions of Their African College Experience and Their U.S. Experience .................................................................................................. 28

Diffusion in Action: A Look into Water Treatment Technology Adoption .................................................................................................. 30

Disposition Towards Critical Thinking: A Longitudinal Study of Latin American Undergraduate Interns at a U.S. College of Agriculture .................................................................................................. 33

Do Cultural Dimensions Impact Leadership Styles of Mexican Project Managers? .................................................................................................. 36

Enhancing Interactions in Online Learning Environments for Taiwanese Agriculture and Natural Sciences Students .................................................................................................. 38

Evaluating the Effectiveness of a Farmer Field School in Northern Uganda Through the Adoption of Improved Ox Yokes .................................................................................................. 41

Experiences of an AgriCorps Fellow in Ghana .................................................................................................. 43

Extension’s Role in Farmer-focused Value Chain Development in Developing Countries .................................................................................................. 46

Factors Influencing Interactions of Taiwanese Agriculture and Natural Sciences Students’ Perceptions of Satisfaction, Quality, and Learning in Online Courses .................................................................................................. 49

Influence of Smallholder Farmer Groups on the Application of Best Horticultural Farming Practices in Kenya .................................................................................................. 52

Informative Examples of Seed-to-Supper Programs in Caribbean Areas .................................................................................................. 54

Measuring Impact of Training to Facilitate the Implementation of the Food Safety Modernization Act (FSMA) in Honduras .................................................................................................. 57

Nutritional Quality of Two Tomato Varieties Costoluto Genovese (Solanum lycopersicum L.) and Wild (Solanum pimpinellifolium) Cultivated in an Aquaponic System .................................................................................................. 60
Ruralization and Urbanization: Sustainability Issues in West Africa........................................65
Serving Across the Divide: Mentorship Needs for College Students and Peer Mentors..........68
Spatial-Temporal Analysis of Green Space in Addis Ababa, Ethiopia ....................................71
Technology Transfer-Appropriation Model of an Integrated System of Food Production for Human Development. An Approach in a Shelter of Adolescents at Risk of Social Exclusion....72
The Impact of Purposeful Learning Activities on an International Experience .......................75
The Influence of Policy on Adoption: A Case Study of Chinese Agricultural Extension.........78
Training USDA Cochran Fellows to Improve Mozambique’s Child Nutrition Programs ........81
Understanding Internal and External Motivation Factors in Youth and Adults Participating in Farm Financial Recordkeeping Workshops in Nicaragua .................................................................83
Using a Triple Helix Model to Increase Competitiveness in the Avocado Industry: The Case of Atlíxco, México ..................................................................................................................86
Using GPS Herding Data as a Teaching Tool in Segou Region, Mali ....................................89
Using Photographs as a Tool to Document Outcomes of Study Abroad Experience..............91
Oral Abstracts from the 2018 Annual Conference of the Association for International Agricultural and Extension Education ................................................................. 94

A Comparative Analysis of Students’ Perceived Agripreneurship Competencies ........................................ 95

A U.S. Fellowship’s Role in Shaping Entrepreneurs’ Perspectives on Youth Empowerment in Sub-Saharan Africa ................................................................................ 98

Africa’s Preparedness for Integrating Experiential Learning into School–based Agriculture Education Programs ........................................................................................................... 101

Agroecology as a Framework for Socially Just Agricultural and Extension Education: Lessons from Cuba .................................................................................................................. 105

An Assessment of Professional Development Needs in Andragogy of Extension Professionals in Nigeria .......................................................................................................................... 108

An Exploration of Agricultural Extension Education Graduate Degree Programs in the U.S. .................. 111

An Exploration of the Relationship Between International Agriculture Students and Their Advisors .................................................................................................................................... 114

Are Latin American Students Thinking Creatively? Evidence from Agricultural Undergraduate Majors after an Internship Program Abroad ...................................................................... 116

Assessing and Clarifying Institutional Roles for Effective Watershed Management in Trinidad .......................................................................................................................................... 119

Attitudes and Transparency: A Case for Communication ........................................................................ 121

Barriers to School Garden Program Success: Expert Consensus to Inform Policy and Practice 123

Building Capacity in Extension Professionals Through Community Development Education . 127

Building Professional Development in Haiti that Aligns Critical Thinking Styles and Philosophical Perspectives .................................................................................................................. 130

Challenges and Opportunities for Managing Green Space in Addis Ababa, Ethiopia ................. 132

Collaborative Governance in a Pluralistic and Demand Driven Agricultural Extension Services in Malawi: Influencing the Adoption of Innovation Platforms ........................................ 135

Common Goals, Different Cultures: Exploring Volunteer Development in Ghana and the U.S. .............................................................................................................................................. 138

Communication with Farmers Post-Disaster in the Organization of Eastern Caribbean States . 141

Cooperative Unions: Catalysts for Change in Least Developed Countries ................................. 144

Developing Critical Thinking and Social Capital in International Agricultural Education: A Case Study in Preparing the Next Generation ................................................................................. 146

Drivers and Shakers of Agricultural Communications: Implications for Sustainable Agricultural Development in Developing and Developed Countries ........................................................................ 149

Enhancing Global Perspectives Through International Agricultural Education Experiences .... 152

Enhancing Learning in Haiti by Determining if Problem Solving Style Influences Faculty Teaching Philosophies .................................................................................................................. 155
Entrepreneur Fellows’ Views after Participating in a Fellowship Program to Empower Economic Success: New Media’s Role in their Ventures

Environmental Perception of University Students: A Comparison Between the [USA University] [College] with the [Latin American University]

Evaluating Food Security in a Honduran Livestock Project

Expansion into the Universe of Big Data

Exploring Analytical Approaches for Understanding Students’ Motivations to Study Abroad

Exploring the Hen House; A Focus on Village Chicken Production in Kenya

Extension Agents’ Use of Learning Based Methods in Trinidad and Tobago

Facebook for Creating Online Networks of Innovation Actors: The Case of Agricultural Organizations in Trinidad & Tobago

Farmers’ Perceptions of Leadership Skills in the National Farmers’ Group of Trinidad

Gender Issues in Land Acquisition and Production Yields: A Mixed Methods Study of the Yilo Krobo District, Ghana

Group Cohesion: Application of Best Horticultural Practices

Haitian Agricultural Faculty Preparation for Their Academic Roles

Haitian Faculty Members’ Perceived Self-Efficacy of Student Engagement, Instructional Strategies, and Classroom Management

Identifying the Capacities Rural Advisory Service Networks Need to Support Global Professionalization

Identifying the Values Typology of Mexican Project Managers

Impact of Gender on Opinion Leadership and Willingness to Act on Water Issues

Impact of Heifer International Programs: A Case Study of NGO Agricultural Extension in Africa

Improving Livelihoods through Youth-Adult Partnerships involving School-based, Agripreneurship Projects (SAPs): The Experiences of Adult Partners in Uganda

Improving the Training of Frontline Extension Workers in Tanzania: A Pilot Curriculum Reform Initiative with the Ministry of Agriculture Technical Institute at Ilongo

Innovation Traits that Facilitate Agricultural Technology and Information Adoption in Brazil

Involving Agriculture Faculty in Study Abroad: A Descriptive and Comparative Analysis of Faculty Involvement in and Perceptions of Study Abroad Programs

Involving Agriculture Faculty in Study Abroad: An Examination of Faculty Perceptions, Awareness, Interest and Experience as Personal Dimension Variables in Involvement

Older Ghanaian Adults’ Perceptions of Physical Activity: An Exploratory Study

Outdoor Childhood Play and the Nature of its Impact: A Case Study
Preparedness of Extension Advisory Services to Support Women Involved in Agricultural Entrepreneurship: A Study in Three Caribbean Islands ................................................................. 225
Promoting a Mandela Washington Fellowship Institute: One University’s Experience with Social Media ......................................................................................................................... 228
Rebuilding Agricultural Extension Service in Conflict Affected Countries After Ending a Civil War: Lessons Learned in Sri Lanka and Liberia ................................................................. 231
Reflections of International Participants on Their Agricultural Training in the United States: Lessons Learned......................................................................................................................... 234
Retrospective pre-test evaluation in an international agricultural education context .......... 236
Student Reflection: What was Learned from a Service-Learning Study Abroad to Scotland .... 239
The CIL Fellows Program – Developing a 21st Century Cohort for Innovation ................. 242
The Influence of an Agricultural Subsidies Extension Program on Smallholder Maize Farmers in Tanzania ......................................................................................................................... 244
Use and Acceptance of Social Media by Agricultural Extension Workers: The Case of Department of Agricultural Extension in Bangladesh ................................................................. 250
Using Public Pedagogy to Train Mexican Project Managers ................................................. 252
Vivayic & Field of Hope: Designing Project-based Learning Agricultural Curriculum for Secondary Ugandan classrooms ......................................................................................................... 255
Poster Abstracts from the 2018 Annual Conference of the Association for International Agricultural and Extension Education
A Critical Exploration of the Transformative Discourse of 4-H Youth Development in International Contexts

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Introduction
4-H has been identified as a strategy to build capacity in developing countries with limited access to formal education and growing youth populations. Over 80 national 4-H programs exist today (Singletary, Smith, & Evans, 2005). Global 4-H is used to expand agricultural business and democratic thinking into rural communities (Fujikura, 2001; Koch, 2010).

4-H was developed as a social change and educational movement for the advancement of rural America (Rogers, 1988; Pangburn, 2012). 4-H was also used by corporatists and the CIA to guard youth populations from communism in the 1950’s and 1960’s, while simultaneously creating new markets for American equipment manufacturers abroad (Rosenberg, 2015). This cultural manipulation contributed to a backlash by youth and their families. This contributed to the radicalization and militarization of youth in Latin American (Rosenberg, 2015) and Asia (Fujikura, 2001). For example, 4-H was exported in the 1950s to Latin America as a credit-scheme, through the Programa Interamericano para la Juventud Rural (PIJR), a board of capitalists who sought to improve rural citizens for the benefit of American agri-business (Rosenberg, 2011; N4-HHPT, 2017). Normative gendered labor norms of farmers and homemakers followed (Rosenberg, 2015). In Nepal, USAID implemented 4-H club work to deliver agricultural knowledge and democratic discourse in a similar pro-market fashion. In conjunction with economic inequality this knowledge helped spur Nepali youth to form a political liberation movement (Fujikura, 2001). In these examples, 4-H work produced antithetical results as a response to imposed development objectives. New 4-H programs are being launched today. For instance, Future Farmers of Afghanistan is a partnership with the U.S. Army (Rosenberg, 2015) and USAID, which supports social change through 4-H in the Republic of Kyrgyzstan (Koch, 2010).

Objectives
A critical cultural perspective of 4-H education may open space for dialogue among practitioners, funding agencies, and youth/families being served to challenge and assess power(lessness) and (in)equality. Our aim is to critically explore the transformative discourse that is embedded in the global 4-H mission through an extensive literature review to help create that space. The social, cultural, and political implications of expanding 4-H in countries across the globe will be explored. Questions are posited for extension professionals to reflect on 4-H implementation praxis and the purpose and direction of global 4-H programming in attempts to transform communities under the 4-H banner.

Theoretical Themes
The term youth development is predicated on the idea of transformational education. 4-H founders had a vision for changing the educational capacity of rural youth (Rosenberg, 2015;
Walker, Marczak, Blyth, & Borden, 2005). This transformational discourse, rooted in individualism and social adaptation (Dirkx, 1998), differs from the transformational education associated with Freire’s (2007) critical pedagogy, which is the foundational ability for learners to begin questioning the nature of her/his/their historical and social situation and the power relationships that (re)construct this reality—to develop a critical consciousness for social change. Identifying, questioning, and challenging motivation and program objectives is essential in this process for transformation and social accountability. From Freire’s perspective, the language used by 4-H program and international exporters of 4-H use cultural and political language to describe the work that they do. There is no way to separate the act of organizing and implementing education, particularly with youth, from the political and civil sphere (Fenwick, 2003; Kroma, 2003). Without careful recognition of the social reproduction goals underpinning 4-H educational practices, practitioners are at risk of repeating historical inequities.

**Conclusions**
The exporters of 4-H need to be cognizant of their motives and be transparent with communities about their objectives and motivations for global 4-H. Otherwise youth and families, will continue to struggle with the duplicitous friction of their own development desires and the transformation hoped for by outside sources.

**Recommendations and Implications**
If left unanalyzed, motivations of U.S. based 4-H staff and in-country partners who desire to improve the lives of young people run the risk of implementing a hegemonic expert driven program. USAID funded initiatives launching the implementation of 4-H will have long lasting implications for those countries that successfully adopt 4-H. With this in mind, we ask such critical questions: Will the expansion of agricultural credit or democratic engagement through 4-H result in policies and governmental practices in favor of the United States? The youth participating? For the desired development of the country where 4-H is implemented? This cautioning is not to dissuade 4-H club work, or the expansion of the Global 4-H Network. Rather because 4-H youth is such a powerful transformational tool, it is a call for practitioners to ask themselves critical questions (Brookfield, 2001): education for who? And, to what end?

**References**


A Hands-on Approach to Training International Development Workers in Sustainable Tropical Agriculture appropriate to Small-Scale Farmers

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Introduction
With a large number of small-scale farmers in the developing world producing much of the world’s food, there is need for international agriculture development workers who focus on techniques and plants that are appropriate for sustainable small-scale farming systems. ECHO, a Non-Governmental Organization, is an information hub for agriculture development workers (missionaries, international development workers, and national agriculture leaders) around the world. ECHO uses an experiential learning approach of action research and laboratory training, to help interns become effective international agriculture development practitioners who can work with small-scale farmers (ECHO, 2017b).

Purpose and Objective
This presentation will provide an overview of a long-standing internship program which trains those working with international small-scale farmers. The single objective of this poster is to describe how this program uses an experiential learning model.

Methods
This theoretically-oriented poster satisfies Mertler’s (2009) characteristics of action research as it is situated in a local context and focused on a local issue (the preparation of development agents for small-scale tropical farming), conducted by a practitioner (an ECHO employee) for other practitioners (e.g. missionaries, international development workers, and national agriculture leaders), with potential results to improve the broader practice of agricultural development.

Findings
As of September 2017, a total of 235 people have completed the ECHO Internship in the last 36 years (ECHO, 2017a). ECHO currently selects 8 new interns a year and the interns study at ECHO for a total of 14 months. Interns are responsible for the farm demonstrations and quickly develop basic skills in various areas such as horticulture, sustainable farming techniques, animal husbandry, agroforestry, and appropriate technologies. Interns also benefit from regular seminars, trainings and field trips designed to enhance these skills along with building skills in areas such as community development, agriculture research and leadership (ECHO, 2015 and ECHO, 2017b).

This provides the interns an experiential learning environment allowing for the steps of experiential learning to take place: concrete experience, observation and reflections, formulation
of abstract concepts and generalizations, and testing implications of concepts in new situations (ECHO, 2017b and Kolb, 2014).

**Conclusions**
Interns, through active work assignments on the farm, along with trainings and on farm mentorship from ECHO staff, are able to walk through the experiential learning process; gaining practical experience, observe and reflect on this experience, conceptualize and generalize these experiences and then test the implications of these concepts in new situations on the farm, while receiving feedback from ECHO staff (ECHO, 2017b and Kolb, 2014).

**References**
A Paradigm in Assessing Community Needs

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Introduction
A systematic process of needs assessment (NA) for health and human services and education has been used in the United States since 1960 (Witkin, 1984). A NA movement was associated with obtaining consensus between a community’s goals and needs (Witkin, 1984). Cooperative Extension organizations used needs assessment to identify future community needs, develop and deliver educational programs based on identified needs. This traditional approach to needs assessment has been widely criticized since the 1970s (Altschuld 2015; Altschuld & Kumar; 2009). Major concerns about the “traditional approach” were: fully quantitative and not people-oriented; high cost of the needs assessment procedure; no funding sources are identified to support addressing the identified problem; needs assessments are always hierarchical and top-down where the voices of the target population are not included.

The researchers sought to overcome the weaknesses of a traditional or single-approach method by using an integrative methodology in assessing community assets and needs. Mixed methodologies in research and evaluation have been widely accepted for the last decade in the social and behavioral sciences (Creswell, 2014). We are recommending the use of a modified, adapted from Creswell (2014), sequential exploratory methodology. Creswell’s method includes exploring a phenomena quantitatively first and then uses single or mixed-method data collection and analysis as a second phase. The findings from this study, and the proposed theoretical framework, contribute to an integrative theory of evaluation research in the Agricultural Extension field.

Purpose and Objective
The purpose of this pilot study was to overcome the weaknesses of a traditional or single-approach research method by using an integrative methodology in assessing future demand for Extension programming. The research objective was to identify needs for future Extension programming.

Method
To identify needs for future Extension programming, [Institution/Extension Name] applied a two-phased approach: Phase I is a research-based market approach, while Phase II is a mixed-methodology of an asset-based approach to NA.

Phase 1. The purpose of a research-based market approach for Extension programming is to identify non-formal educational demand through the comprehensive examination of local community resources, assets and trends. The market report for the urban pilot county selected included secondary data analysis of the following major areas: demographics; health; agriculture; business and industries; local county Extension resources; recent Extension programming efforts; non-formal (community) educational opportunities outside Extension; and world, national, and
local trends. The data was gathered from the U.S. Bureaus of Census, Labor Statistics, and Economic Analysis; administrative records and local historical records were also used. Other primary data collection techniques, such as a “Quality of Life/Extension programming needs” instrument are currently being developed and will be used as a continuation of this current research to identify future extension programming across six impact areas namely: 1) health and wellness; 2) job skills and careers; 3) thriving across the life span; 4) sustainable food systems; 5) engaged Ohioans, vibrant communities and 6) environmental quality.

For phase II, an asset-based approach to NA methodology was utilized Altschuld (2015). The approach used during community dialogue sessions was a hybrid approach of the assets/capacity building NA known as an “asset-based approach to needs assessment”. The “dine and dialogue” session is just one of the techniques utilized to gather qualitative data about the community. Nine County Extension Advisory Committee members, who included local leaders from institutions and organizations in the county, were invited to participate in a discussion group during a lunch meeting. A second dialogue session was held with leaders in urban Extension counties in the state.

Results
Summarizing the two phases - the most important issues and concerns found are: work readiness among low-income youth and adults; education-level concerns; low level of acceptance of differences and diversity of communities; changes and barriers related to family structure; social and cultural norms; poverty cycle; healthy lifestyle; and healthy and safe neighborhoods. The most important identified assets are: emerging technologies in agriculture; opportunities in urban agriculture; existing facilities and resources; and actively engaged and collaborative citizens.

Recommendation
Analyzing community needs is one of the key steps in the Extension program planning process. We recommended the use of a mixed-methodology approach to needs assessment that will complement a more traditional Extension needs assessment. Mixed-methodology will help to mobilize a community’s assets, resources, strengths, and opportunities available to address the identified needs. The findings will be used by Extension educators to design future programs.

References
Advancing Use of Appropriate Farm Mechanization Adoption Among Small-Scale Malawian Farmers

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Introduction
The adoption of technology continues to be an investigated topic among international agricultural and extension education researchers (Ganpat, Ramjattan, & Strong, 2016; Kanyi, Lawver, Ulmer, & Murimi, 2016; Zelaya, Harder, & Roberts, 2017). There is optimism that appropriate farm mechanization can improve efficiency and effectiveness of farm operations among smallholder farmers (Mottaleb, 2016). Mechanization may offer more returns to small-scale farmers hence ensuring agricultural productivity and quantities produced (Diao, 2014). Consequently this can ensure food and income availability at household level across Malawi. The results aims at informing development institutions to make informed decisions and tailor initiative that can bring impact to the nation.

Purpose and Objectives
This study’s purpose was to understand factors affecting low use of mechanized innovations with focus on the role of agricultural extension. Specifically, the objectives were:
1. To determine the extent to which Malawian farmers utilize mechanized innovations;
2. To establish the national commitment on promoting farm appropriate mechanization among small-scale farmers;
3. To assess the existence of support services that can advance appropriate farm mechanization; and
4. To examine factors affecting limiting appropriate farm mechanization among Malawian farmers

Methods
A five-tier multistage sampling technique was engaged for the study. The first stage involved in selection of districts. Malawi has three main geographical regions namely North, Center and South. At least one agricultural district was selected from each region. The Mzimba, Lilongwe, Mchinji, and Machinga Districts were chosen for this study.

The second stage, involved sampling of lower level clusters known as agricultural Extension Planning Areas (EPAs). The third stage sampled villages and the fourth stage randomly selected small-scale farmers as the primary study subjects. Concurrently, at district level, agricultural extension service providers including public, private, NGOs and INGOs were purposively selected and approached to identify existence of mechanisms and services that supports farm mechanization.

A semi-structure questionnaire was used to collect qualitative and quantitative data through face
to face interviews with farmers. Different checklists were used as guidelines to conduct interviews with various service providers at district and national levels.

**Results and Conclusions**

Results of the study showed that were able to generate mechanized innovations that fit best to farmers’ context using locally available raw materials and resources. A few technologies including a simple sheller were documented. A technology chain analysis profiled a number of mechanized innovations that have been assessed by the formal National Agricultural Research Service (NARS), the University and the local industry. The results also showed that agricultural extension support on mechanized innovations were inadequate. Farmers expressed that there were not appropriate innovations for some specialized farm operations.

NGOs, INGOs and public institutions promoting farm mechanization was low. The data unveiled existing agro-dealers who were advocating use of selected mechanized innovations and providing specialized extension support. There were few appropriate workshops and in some areas and none in other areas, to maintain mechanized innovations used by farmers. The study further revealed that existing machine-shops, mechanical-shops and garages were not well equipped and/or lacked expertise to innovate and provide farmers mechanized innovations. It was also observed that different mechanical service providers had varying skills and capacity. We cannot conclude that farmers were not adopting farm mechanization when few or no innovations appropriate for adoption existed.

The study, assessed existence of extension support, policy and government initiatives facilitating use of mechanized innovations. The results indicated a National Agricultural Policy (Nankhuni, 2017) has been drafted and ready for launch in early 2018. The study concluded that each level associated for promoting farm mechanization had organizational barriers limiting adoption. Additionally, the results showed that there are a number of government projects that are advancing appropriate farm mechanization among small-scale farmers unfortunately there are few appropriate mechanized innovations to be promoted for use by farmers.

**Recommendations**

Government created staff positions for recruiting farm mechanization extension officers although the positions are rarely filled. Where filled, staff are not effectively trained. Where trained, staff do not have service shops and storage facilities to effectively store or maintain mechanized innovations. Consistent training of Malawian extension staff is paramount.

Adoption diffusion inquiries are needed with Malawian farmers. Innovations need to be generated that meet farmer’s needs. Two or three service providers should collaborate and combine capacity. The result could be efficiency, targeted innovations that provide farmers with farm mechanization needs (Diao, 2014), and lead to increased food production.

**References**


Agricultural Literacy at the Intersection of Human, Natural, and Cultural Systems

Introduction and Review of Literature

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Introduction
Literacy is a key cultural achievement to celebrate. The development of written language was the greatest social invention in world history. Writing improved our cognitive ability by allowing us to preserve an archive of knowledge on which to build new discoveries. Nowhere is that more important than in agricultural literacy, for the provision of food and clothing depends on agricultural literacy. Radhakrishna, Leite, and Hill (2003) stated that the answer to global illiteracy was increased education and enhanced opportunities for people to learn. Many authors have highlighted low agricultural literacy levels among farmers (e.g. McCole, Culbertson, Suvedi, & McNamara, 2014) and students (e.g. Elliot & Yanik, 2004). The concept of agricultural literacy, however, has not been fully defined or explained in the literature, perhaps because of the ambiguity of the term literacy (McKenna & Robinson, 2014). Functional literacy is the ability to read and write sufficiently to function in a society, e.g., by reading the newspaper, usually written at about eighth grade level. Workplace literacy is a higher level of literacy needed to earn a living, e.g., by reading technical manuals, often written at a 14th grade level. Applied to a discipline like agriculture, workplace literacy becomes disciplinary literacy, the ability to use reading and writing to learn in a discipline. Achieving the highest levels of agricultural knowledge requires agricultural literacy, which accelerates learning in the classroom and enables autonomous learning beyond the classroom.

Purpose and Objectives
The purpose of this poster is to visually depict literacy in the discipline of agriculture at the intersection of human, natural, and cultural systems. This poster will depict also an innovative educational model for that is being used to increase agricultural literacy of farmers, students, and public globally.

Philosophical Themes and Conclusions
Agricultural knowledge is a key contributor to agricultural literacy. The more you know about any subject, the easier it is to read to learn in that area. However, one can acquire agricultural knowledge without recourse to literacy. Until the invention of writing, all agricultural knowledge was transmitted by word of mouth. Today, much agricultural knowledge is learned by videos and hands-on demonstrations in the classroom. However, if learning is restricted to visual and verbal tutelage, learning may end at the classroom door.

Agricultural literacy requires specialized reading and writing abilities beyond the ordinary functional literacy of those outside the discipline. For example, a text featuring an agricultural schematic diagram on hectares under certified organic management may baffle highly literate students in, say, Ghana literature, for those without the unique skills of agricultural literacy would not be able to read that text with comprehension.
A complete definition of agriculture emerges from observations of expert agricultural readers and writers who can make their thinking public by the method of “thinking aloud.” Shanahan, Shanahan, and Misischia (2011) used think-alouds to probe the expert reading processes of highly literate readers in history, mathematics, and chemistry. Explicating the methods of agricultural literacy would require similar observations of expert readers in agriculture as they learn from specialized agriculture texts.

To the degree that we can specialize the expert processes of agricultural literacy, we can teach these processes to students in agriculture classrooms. This requires scaffolding readings in challenging agriculture texts, i.e., supporting the learning of agriculture students in reading and writing to learn. It would involve teaching the specialized vocabulary of agriculture and the strategies for reading and writing the technical literature in the field. Survey data suggests that these practices are not common in classrooms; only 14% of teachers are consciously working to help their students learn disciplinary content by reading and writing to learn (Irvin & Connors, 1989). This implies that 86% of teachers are circumventing reading and writing by relying on videos, lectures, discussions, and hands-on activities while excluding the guided reading and writing assignments that develop disciplinary literacy. If these percentages hold in agriculture classrooms—and we think they do—most agriculture students are not learning to read to learn agriculture content beyond the classroom, or to write to extend their learning and share their insights with others.

**Recommendations and Educational Implications**

The educational importance of this study are bound by the need for agriculturally literate farmers, students, and public in a global society where the production, processing, and distribution of agricultural product is a complex endeavor at the intersection of human, natural and cultural systems. The innovative educational model presented can increase the quality of instruction, learning, and satisfaction in agricultural literacy. If extension agents and those primarily charged with improving agricultural literacy rates of farmers, students, and public use the systematic approach presented in this innovative educational model, agricultural literacy will be understood better and that agricultural literacy rates will increase.

**References**


An Expertise-Oriented Evaluation of Development Agent Preparation in Ethiopia

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INTRODUCTION
Ethiopia has made a sizeable investment in its public sector agricultural Extension System. According to Davis et al. (2010), there were 45,812 development agents (DAs) assigned to 8,489 Farmer Training Centers (FTCs) with plans to increase the number of DAs to 60,000. If this goal were reached, the DA:farmer ratio would be 1:476, one of the lowest Extension agent-farmer ratios found in the world. To staff these FTCs, 25 Agricultural Technical and Vocational Education and Training (ATVET) Colleges have been established (Belay & Alemu, 2017). ATVET students complete two years of study on campus followed by a ten-month apprenticeship.

In May 2017, an expert team completed a volunteer assignment aimed at improving the capacity of ATVETs to prepare DAs. This project was administered by Catholic Relief Services (CRS) and funded by USAID as part of the Farmer-to-Farmer program.

PURPOSE AND OBJECTIVES
The purpose was to assess the capacity of ATVETs to prepare DAs for agricultural extension work and to then make recommendations for improvement. The objectives were to: 1) assess existing capacity of ATVETs in providing agricultural Extension, 2) assess existing curriculum of ATVETs in providing quality agricultural Extension, and 3) identify strategic areas that requires future volunteer assistance.

METHODS
An expertise-oriented approach (Fitzpatrick, Sanders, and Worthen, 2011) was used for this evaluation. Among the sources of data were Farmer-to-Farmer reviews, Ethiopian Ministry of Agriculture, five ATVETs and universities, and various FTCs. Thirty-five administrators, faculty members, students, and DAs met with our team in the conduct of this project.

RESULTS AND CONCLUSIONS
ATVETs have high faculty turnover rates, limited library references and resources, limited laboratory equipment, very little short term development training particularly in the area of teaching and learning, weak and interrupted Internet, poorly equipped classrooms, limited agricultural machinery, and limited availability of post-graduate programs for faculty. The experts observed instances of strength within each location. Examples include administrators and faculty who aspire to improve institutional capacity, large enrollments of eager students, and unique opportunities within each institution (Donkey Sanctuary, aquaculture ponds, drip irrigation, etc.).

RECOMMENDATIONS
The following are recommendations to CRS as it works with ATVETs, DAs, FTCs, & Universities to improve the delivery of Extension services. 1) Revise curricula to include more
emphasis in Extension Education focused on technological change, adoption/diffusion, program planning, program implementation, program evaluation, and youth development. Additionally, Entrepreneurial Education should be incorporated into the curricula. 2) Capacity building for academic staff in technological change, adoption/diffusion, program planning, program implementation, program evaluation, youth development, and entrepreneurship. 3) Formation of a professional association for DAs where members interact on annual basis for the purpose of sharing scholarship and experiences. Volunteer assistance could be in the form of a leader from an existing professional association helping to organize such a professional association. And 4) DAs should be provided FTC-specific professional development training in train-the-trainer style workshops. CRS volunteer assistance should provide the initial training. Participants could then be incentivized to train other DAs. DAs should be encouraged to operate FTCs as profit centers.

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Introduction
Water scarcity affects 40% of the global population (United Nations, n.d.). By 2050, one billion urban dwellers will suffer regular shortages - less than 100 liters of water per person daily (McDonald et al., 2011). Since 2014, about 54% of the global population lived in urban areas - expected to increase to 66% by 2050 - therefore, sustainable urbanization is an important consideration (Keles, 2001; U.N., 2014). Urban residents, those residing in urban areas, are mainly characterized by population density and non-engagement in the agricultural sector (United Nations Children’s Fund, 2012). An overview of selected global water programs could provide alternative approaches to promoting water conservation through international Extension programs. Scarcity of finite water resources (Russo, Alfredo, & Fisher, 2014) is a global issue: Florida, Australia, Germany, Jordan, and Cyprus are just a few locations where water conservation is needed because of drought conditions or excessive demand (Makropoulous, Rozos, Bruaset, Frijns, & van der Zouwen, 2012; Russo, Alfredo, & Fisher, 2014; Salian & Anton, 2011).

Purpose and Objectives
This study sought to highlight education urban water conservation programs in selected locations to identify various water saving strategies. The objective was to provide an overview of educational and outreach water conservation practices from selected locations that might be applied in new ways to promote water conservation.

Methods
An integrative literature review was used to identify new Extension program approaches that could be applied globally to urban water conservation to address “potential re-conceptualization of the expanding and diversified knowledge base of the topic as it continues to develop” (Torraco, 2005, p. 357). The review centered on water programs in selected countries with urbanization problems. Information was gathered from journal articles, governmental and technical reports meeting these criteria:
- reference to programs addressing urban water problems;
- countries with rapid urbanization straining urban water resources;
- urban water programs provided by local government, a water commission, or international body

Results
The Florida Friendly Landscaping (FFL) program was designed to reduce urban water-use by promoting residential landscaping best practices using minimal inputs (Florida Yards and Neighborhoods Homeowner Programs, 2014). The program uses guiding principles and yard certifications to encourage water resource protection. Residents desiring FFL signs and Gold or Silver recognition can have their yards inspected by yard advisors. This participatory strategy promotes residents’ commitment to conserving water.
Similarly, in Australia, water saving strategies included: restrictions for outdoor water-use, different water prices based on consumption, replacement of inefficient showerheads and toilets, access to qualified plumbers, do-it-yourself water-saving kits with easy to install devices, rebates, and educational programs on repairing hidden leaks ((Cahill & Lund, 2013; Makropoulos, et.al., 2012).

In Cyprus, low water gardening is promoted by a blogger who shares home experiments and tips useful for smart gardening. On an individual level, this strategy helps diffuse knowledge that reduces water demand and encourages others to engage and post their experiences. Some tips include low water plants that reduce garden irrigation and shrubs that help retain soil moisture lost to evaporation. This provides a forum for others interested in innovative home-projects to gather good ideas on water conservation.

Berlin’s 65,750 square meters of green roofs (Salian & Anton, 2011, p. 18), helps the city retain rainwater, provide water purification and runoff delays, and add green spaces to urban areas. Rain water harvesting is another practice that reuses rainwater collected from streets and yards for flushing toilets, outdoor watering, and laundry (Makropoulous et. al., 2012). These strategies help reduce wastewater production in urban areas.

The Water Efficiency and Public Information Action program in Jordan supports public awareness of water issues and educational strategies (Makropoulous et. al., 2012). Specifically, ministry-supported Master’s school curriculums were designed to address best management practices and water management (Makropoulous et al., 2012). This strategy ensures an institutional framework for sustainable urbanization and water conservation by appealing to public knowledge, attitudes, and behaviors.

**Recommendations and Implications**

Strategies can be categorized at the individual and institutional level. In areas where water management Master’s programs are developed, Extension professionals can partner with institutions offering applied experiences and current water problems. Furthermore, water curriculums can be designed for the elementary school level to help educate the future generation on water issues and potential solutions. Encouraging discussions about home projects and shared experiences that spreads innovative ideas on water conservation that can attract friends and family to get involved. International Extension professionals should consider some of these approaches and share their experiences with successful and unsuccessful urban water conservation strategies.

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Building the Teaching Capacity of African Plant Breeding Program Faculty through E-learning Resources and a Communities of Practice.

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Introduction

To reduce hunger and poverty for millions in sub-Saharan Africa, agricultural productivity needs to increase in a sustainable way (Bill & Melinda Gates Foundation, 2017). One approach to meeting this challenge is to improve the teaching capacity of African university faculty in preparing the next generation of plant breeders. Through a pilot project called Improved M. Sc. In Cultivar Development (IMCDA) funded by the Bill & Melinda Gates Foundation, a set of e-learning content resources entitled Plant Breeding E-Resources in Africa (PBEA) were created. These materials were developed by Iowa State University (ISU) plant breeding faculty with assistance from African university faculty. During the PBEA curriculum pilot, funders and developers identified the need to improve integration of the PBEA resources and provide professional development (PD) related to teaching and learning. To address the needs, a strategy was initiated to foster a community of practice (CoP) between African plant breeding professors involved in the pilot. A community of practice is a group of professionals who are collectively engaging in learning together (Snyder & Wenger, 2010).

Purpose

The purpose of this three year project is to improve the adoption of PBEA e-learning resources and learner-centered classroom approaches through fostering a CoP among plant breeding faculty from African three universities.

Methods/Products

The elements of past successful CoPs include: 1) a group identity and a commitment - in this case plant breeding education and its role in reducing hunger in Africa; 2) a feeling of community with diverse membership; 3) a set of products - tools, strategies, and activities that members engage in and share with each other (Iaquinto, Ison & Faggian, 2011). These elements informed this multi-year project. The first year focused on developing strong relationships between ISU team members and African professors in the pilot project, a condition of establishing effective CoPs. This relationship building included gathering base-line information about: the current teaching practices of African faculty; the level of PBEA curriculum integration; and the African university context (i.e. the institutions, classroom practices and social/cultural preferences). This was accomplished through a survey, informal discussions at a national meeting, observations of individual faculty over a 3-5 day period in their classrooms, and interviews with teaching assistants and students. From the data, a number of products were selected to establish a COP that increased curriculum adoption and improved teaching and learning. These products included: 1) a website for effective teaching methods and resource sharing; 2) a monthly newsletter; 3) individualized face-to-face professional development at each
university; 4) opportunities for faculty to develop educational products; 5) visits and discussions at IMCDA meetings and workshops; and 6) week-long symposiums on teaching and learning designed by faculty from each institution. The second and third year of the project focus on product development and implementation.

**Results & Findings**

Baseline assessment/discussions revealed that 2/3rds of faculty used at least one of the e-modules at the start of year one. The reasons for non-use included development of their own lessons, the U.S. orientation of the resources, and lack of confidence in how to integrate the curriculum. Faculty shared that they relied on lectures, class discussion, and occasional use of case studies as their primary teaching methods. Only one-half of the faculty responded that they had participated in past professional development on the topic of teaching. In-country observations confirmed baseline data and revealed practices that could be improved such as developing lesson plans and use of learner-centered techniques in the classroom. African universities programs have varied curricula/class time structures, and not all have reliable internet access. The availability of resources such as books, lab equipment and reagents is problematic. Cultural/social conditions such as faculty preference for face-to-face interactions versus on-line or use of discussion boards were found as well. Post evaluation of the week-long teaching and learning symposium revealed 100% of the participants believe that their teaching improved, they can use e-modules more successfully, and they plan to create lesson plans as a result of the symposium. In year three, final products will be administered and the final evaluation conducted.

**Educational Importance**

This project seeks to empower plant breeding faculty from African Universities to improve their teaching capacity through high quality content resources such as the PBEA E-learning resources and better attention to learner-centered teaching. After the project is completed the methods, products, and insights learned could have great potential to be replicated continent-wide. The Alliance for a Green Revolution in Africa (AGRA) and Regional Universities Forum for Capacity Building in Africa (RUFORM) and the Intra-Africa Academic Mobility Scheme (IAAMS) have been engaged to seek ways to scale-up this project after the grant period is completed.

**References**


Comparing African Student Perceptions of Their African College Experience and Their U.S. Experience

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Introduction
African universities have been called upon to assist in the attainment of the Sustainable Development Goals (SDGs) outlined by the United Nations (U.N.) (Duran, 2018). In order to address complex food security issues outlined by the U.N., universities have been challenged with expanding their capacity through international partnerships (Jowi, Knight & Seholle, 2013). Entities such as the Bill & Melinda Gates Foundation (BMGF), USAID, World Bank (WB) and United States (U.S.) universities have mobilized to assist Africa universities when their goals align. When U.S. university personnel are engaged with international faculty and institutions it is important for them to understand the context of the institutions, classrooms, faculty and students to be effective partners in achieving university and United Nations SDGs.

Purpose and Methods
The purpose of this study was to compare African student perceptions of their higher educational experience in Africa with their experience in the U.S. Two 1.5 hour focus group sessions were conducted with fourteen African graduate students attending Iowa State University in Spring of 2017. One focus group was held with students from Ghana (3) and another focus group from students in Uganda (11). All students received an undergraduate degree from their home African country and twelve received their master’s degrees from an institution outside of Africa. All were currently working on their PhDs in either math (3) or an agricultural science (11). Both discussions were analyzed using a method described by Kruger and Casey (2009). The focus group interviews were audiotaped, transcribed, and each quote from the transcriptions was organized by question and colored coded by country. Specific quotes were organized into themes.

Findings
Similarities. Participants generally agreed that professors in both the U.S. and Africa were knowledgeable about their subject and use class time to lecture to students. They described instructors sharing content using PowerPoint slides, providing notes and administering exams.

Perceptions of U.S. Higher Education. Students noted they had more choices in their program of study as U.S. graduate students compared with African graduate programs. Students commented on the plentiful resources. They discussed professors using more class time for students to do presentations, work on exercises to learn concepts, and do laboratory work. Students spoke about the high quality of relationships they have with their professors and appreciated being encouraged to address them by their first names and have informal discussions with them. Participants shared that U.S. professors tend to assess their learning by administering
quizzes and tests throughout the semester. Participants identified this as adding to their learning of concepts and principles in their field of study versus a reliance on assessments testing for recall.

**Perceptions of African Higher Education.** Participants noted many concerns about their African university experience. These concerns were categorized as institutional, cultural, and faculty instructional issues. Participants were quick to point out some issues hindering faculty from providing better instruction were not their fault. Institutional issues included high student to faculty ratios, faculty pay that leads to conflicts of interest and unavailability, lack of learning resources, and reliance on one or two examinations per term. A cultural issue voiced was a “gap.” Students defined this as a power differential between themselves and their African professors which they believe contributes to strained student-faculty relationships. Faculty instructional issues were categorized as lack of office hours, hands-on practical experiences and labs to reinforce learning; and a high reliance on testing for recall versus understanding.

**Implications & Limitations**
The findings of this study are relevant to understanding the preferences and concerns African graduate students have with their education in the U.S. and Africa. This understanding can assist U.S. professors and international funding entities understand the situational and cultural context of African university classrooms in Ghana and Uganda. This will aid U.S. faculty with creating effective collaborations with African professors by understanding institutional resource constraints, cultural norms, and faculty instructional preferences. This understanding can improve programs we implement with our African partners that will have greater success in our programs aimed to improve conditions in sub-Saharan Africa.

This study is a snapshot and it is important to note that most participants had an undergraduate experience in Africa which they were comparing with their U.S. graduate experience. Further focus group sessions are planned to improve this study.

**References**
Diffusion in Action: A Look into Water Treatment Technology Adoption

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Introduction
The world is expected to reach a point where there is an insufficient supply of water by 2030 (2030 Water Resource Group, 2009). One of the largest users of agricultural water resources, nursery and greenhouse growers, use roughly 4.5 million gallons of water per acre annually to keep products growing sufficiently (Bailey, Bilderback, & Bir, 1999). Water restrictions are difficult for growers given water is such a significant part of their production practices (Knight, Owen, & White, 2017). Recycling water has been a method growers have engaged in to reduce the amount of water they are consuming and aid in alleviating the water scarcity battle (Knight, et al., 2017; Lamm et al., 2017). However, water must treated before it is reused to prevent unwanted pathogens and microorganisms coming in contact with plants (Bilderback, Dole, & Sneed, n.d.). Growers understand the need to reuse and recycle water but do not adopt water treatment technologies to a great degree (Lamm et al., 2017). There is a need to understand growers’ diffusion process (Rogers, 2003), and if cognitive styles impact the diffusion process, in order to develop targeted international extension initiatives that could lead to greater levels of water treatment technology adoption, dramatically decreasing water use in this water hungry industry.

Purpose and Objectives
The purpose of this study was to determine what impacts nursery and greenhouse growers’ adoption of water treatment technologies. The objectives were to (a) determine if growers’ critical thinking styles influence adoption (b) determine if growers’ problem solving styles influence adoption, (c) determine if growers’ critical thinking styles and problem solving styles influence how they perceive the characteristics of a water treatment innovation, and (d) determine if critical thinking styles, problem solving styles, and perceived characteristics of an innovation influence growers’ adoption of water treatment technologies.

Methods
A sample of 197 nursery and greenhouse growers in the U.S., found to be representative of growers in the country, responded to an online survey. Critical thinking style was measured using the University of Florida Critical Thinking Inventory (Lamm & Irani, 2011). Problem solving style was measured using Kirton’s Adaptation-Innovation Inventory (Kirton, 1999). A researcher-developed scale was used to measure perceived characteristics of an innovation. A five-point Likert-type scale was used to identify respondents’ level of agreement or disagreement with statements related to perceived relative advantage, compatibility, and trialability of water treatment technologies. A five-point semantic differential scale was used to measure perceived complexity of water treatment technologies. Two multiple choice questions were used to indicate perceived observability. The respondents were also asked to indicate which of 12 water treatment technologies they had implemented. An additional question asked if the technologies were still being used. Logistic regressions were used to determine if critical thinking style and problem solving style were predictive of the perceived characteristics of an innovation. Linear regressions
were used to determine if the perceived characteristics of an innovation, critical thinking style, and problem solving style were predictive of implementing water treatment technologies.

**Results**

A cognitive map was developed to depict the results of the linear and logistic regression statistical tests. Growers that were more adaptive in solving problems perceived greater relative advantage and increased compatibility of water treatment technologies. The more engaged a grower was, in terms of their critical thinking style, the greater their perceived compatibility and trialability of water treatment technologies. Also, an engaged critical thinking grower was more likely to implement water treatment technologies. The perceived characteristics of an innovation (increased relative advantage, compatibility, observability, and trialability and decreased complexity) led to increased implementation and adoption of water treatment technologies.

**Conclusions and Recommendations**

The results indicated growers were more likely to engage in water treatment technologies if they perceived the technologies as compatible with their existing systems and felt they were able to try the technologies before implementing. Increased engagement led to increased implementation, however, growers indicated they were unable to engage in observing water treatment technologies used by other growers or operations. Extension professionals around the world, working with this audience, should facilitate opportunities for growers to engage with water treatment technologies which will assist with understanding how they are compatible with their existing systems. Extension professionals can also provide opportunities for growers to observe water treatment technologies in action by inviting growers to field days at operations using the technology, developing trial sites, and disseminating videos that highlight the technologies in practice online.

**References**


Disposition Towards Critical Thinking: A Longitudinal Study of Latin American Undergraduate Interns at a U.S. College of Agriculture

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Introduction
According to Facione (2007) “Critical thinking is the process of purposeful, reflective judgment focused on deciding what to believe or what to do” (as cited in Insight Assessment, 2017, p.16). The industry demands, from higher education, students with a variety of skills including critical thinking abilities, problem solving, and analytical skills (Duncan, Hass, & Ricketts, 2016). Measuring critical thinking skills continues to become more important as educational programs are required to demonstrate their contribution to the improvement of individuals’ critical thinking skills (Insight Assessment, 2017).

Purpose and Objectives
The purpose of this longitudinal study is to evaluate the critical thinking dispositions of students participating in an internship program in College of Agriculture. The objectives are:
1. Describe the critical thinking disposition of students.
2. Assess the reasoning mindset attributes of students by group and gender.
3. Ascertain the relationship between students’ GPA scores and reasoning mindset attributes.

Methods
This longitudinal trend study used a survey methodology. The purposive sample consisted of forty-five students who participated in an internship program during: 2014 (n = 9), 2015 (n = 14), 2016 (n = 10), and 2017 (n = 12). Data was collected using the California Critical Thinking Disposition Inventory (CCTDI). Seven attributes are measured by the CCTDI including: truth-seeking, open-mindedness, inquisitiveness, analyticity, systematicity, confidence in reasoning, and maturity of judgement (Insight Assessment, 2017). The instrument consists of 75-item using a six-point Likert-type format. Overall scores can range from 70 - 420 and 10 - 60 for each attribute. Authors have established validity and reliability of the commercial instrument (Insight Assessment, 2017). Scoring was conducted by Insight Assessment per license agreement. Data analysis was conducted using SPSS®, p-value of 0.05 was set a priori.

Results
Results revealed critical thinking dispositions of student interns were generally positive. The exceptions were inquisitiveness (strongly positive), and truth-seeking (inconsistent). The overall score was 308.93 (SD = 24.25). The highest mean score was observed in the attribute inquisitiveness (M = 50.20, SD = 5.56), while the lowest was observed in truth-seeking (M = 36.40, SD = 4.89).

An independent sample t-test was conducted to evaluate whether student interns scores varied with gender. A statistically significant difference was found in the subscale of confidence in
reasoning $t(42) = -2.34$, $p = .02$. In this attribute, males ($M = 48.33$, $SD = 6.39$) scored higher than females ($M = 43.86$, $SD = 4.70$). A large effect size was found ($d = .78$)

A one-way ANOVA was conducted to evaluate whether student interns scores change among cohorts. The results revealed student interns scores were significantly different for subscale of maturity of judgement by year of cohort, $F (3, 41) = 3.13$, $p = .04$. Effect size was found to be negligible ($\omega^2 > .01$). Post hoc analysis using Tukey criterion revealed a significant difference between students ($M = 47.11$, $SD = 5.42$) in the 2014 and 2016 cohorts ($M = 40.30$, $SD = 5.31$), $p = .04$.

A Pearson moment correlation revealed a substantial positive association $r = .62$, $p < .001$ between GPA and confidence in reasoning, and a moderate positive association $r = .34$, $p = .03$ between GPA and inquisitiveness (Davis, 1971).

**Conclusions/Recommendations**

Students in all cohorts displayed a strong intellectual curiosity through the reasoning mindset inquisitiveness. During the internship program, students were presented with different opportunities to inquire and expand their intellectual capacity through research experiences, thus, fostering critical thinking abilities, which is considered as a fundamental ability to be successful (Irani, Rudd, Friedel, Gallo-Meagher, & DeFino, 2000).

In contrast, truth-seeking was found to be inconsistent. Perry (1970) discussed students obtaining low scores in truth-seeking may suggest a lack of interest in seeking the truth and accepting the answers provided by authoritative figures (as cited in Ip, Lee, Lee, Chau, Wootton, & Chang, 2000). It is recommended to encourage an open environment where interns feel comfortable to ask hard questions, are open to new ideas, and become aware of their own biases. Looking at the reasoning mindset attribute scores provide important information to program coordinators to develop training and experiences to enhance these attributes.

These findings suggest women had less confidence in reasoning. This strengthens past studies findings (Martin & Phillips, 2017). Past studies highlight the relationship between GPA and critical thinking (Ip et al., 2000). In this study stronger dispositions in confidence in reasoning and inquisitiveness were correlated with higher GPA scores. It is recommended to explore the role of GPA and critical thinking by gender to identify areas of improvement in the program.

**References**


Do Cultural Dimensions Impact Leadership Styles of Mexican Project Managers?

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Introduction

For professionals in international agricultural development who are interested in the intersection of human, natural and cultural systems; increasing effective project management is paramount. Whether it be USAID, Winrock International, or other agencies and non-profit organizations, developing effective teams, promoting empowerment and engagement, managing budgets, and planning/evaluating projects requires a desirable set of skills. Understanding leadership styles is one such skill.

The Training and Development Professional Certification Program was developed and launched in 1991 with its sole purpose to deliver a 40-hour training programs that led to certificates in training and development. In 2007, the program was expanded to include offering of programs across the spectrum in the “train-the-trainer” format. One of those programs is a certificate in Project Management. It was this program that was delivered on the campus of Universidad Panamericana in June 2017. Participants included project managers from government, healthcare, agricultural marketing, seed companies and higher education.

A significant part of the curriculum for this certificate program focused on leadership competencies. As Etling and Radhakrishna (1998) note, leadership styles are desirable competencies to learn for Mexican audiences. One area of leadership focused on during the certificate program was leader behavioral style models. Blake and Mouton (1964) created a leadership grid to determine various leadership styles as a personal and professional development tool. Essentially the model determines if a leader or manager has more concern for work productivity or concern for people. There are four quadrants with one style in the middle. The impoverished leader expects minimal effort and has little concern for either staff satisfaction or work targets. The country club leader is attentive to people’s needs, but not as concerned about results. A middle of the road leader tends to compromise and maintain the status quo. The authoritarian leader concentrates primarily on results in a controlling style. The team leader achieves excellent performance and dedication to the workplace goals. Typically, the team leader style is preferred due to the ability to build rapport and trust with personnel (Blake & Mouton, 1964).

Purpose and objectives

This research explores the five leadership styles through Hofstede’s cultural dimensions theoretical framework. These include power distance, uncertainty avoidance, masculinity vs. femininity, individualism vs. collectivism, and long vs. short term orientation (Hofstede, 2001). Mexico has a high score in collectivism, with a keen sense for group formations and social harmony compared to the United States which scores higher in individualism. The objective of this study was to ascertain the leadership styles of the Mexican project managers and compare those to Hofstede’s cultural dimension of collectivism.
Methods
The Blake and Mouton (1964) questionnaire was given to the participants, before the presentation on leader behavior theory, to obtain a more authentic measure of leadership style. The questionnaire contains 18 Likert Scale questions with nine centering on leadership task focus and nine on concern for people. Seventeen participants completed the questionnaire and included 13 women and four men whose project management experience ranged from one to 35 years. Data was collected on site and analyzed using Excel.

Results and conclusions
Eleven participants were classified as Team Leaders. Team Leaders are those whose task and relationship scores are high. This quadrant signifies leaders who not only care about task and their people, but also want to advance the organization and increase effectiveness. Team leaders have a high focus in collectivism, which affirms Hofstede’s (2001) work. It can be concluded that for this population, collectivism plays a key role in leadership style.

The remaining project managers self-reported as Organization Man Leaders. This classification means their task score and relationship score ranged between a four and six on the questionnaire, and are considered moderate in both categories. This finding too affirms Hofstede’s (2001) study. These participants cared equally for tasks and people but focused less on advancing the organization and more on maintaining status quo which is also fundamental for the Mexican culture.

Recommendations and implications
Understanding a culture is imperative for international agriculture extension educators as they deliverer content (Tuttle, Lindner, & Dooley, 2004). For those who focus on developing collective interpersonal skills in Mexico, Hofstede’s (2001) cultural dimensions provides a framework for understanding leadership from a cultural lens.

Further study of this country and the correlation between established leadership models and Hofstede’s work is recommended to enhance international teams working in agricultural and extension education.

References
Enhancing Interactions in Online Learning Environments for Taiwanese Agriculture and Natural Sciences Students

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Introduction
Using effective multimedia technology is a valuable strategy to enhance interactions in online class settings (Hooper & Rieber, 1995). Appropriate use of instructional technology can enhance students’ learning (Alonge, 2005; Karbasioun, Mulder, & Biemans, 2006; Peñalosa, Murphrey, Murphrey, Piña, & de la Concha-Bermejillo, 2004). The challenge for instructors is selecting appropriate technologies that will enhance online students’ learning. Economic and technical advantages are the main influencers on instructors’ technology selections for course instruction (Su, Bonk, Magjuka, Liu, & Lee, 2005). Instructors’ lack of knowledge about the availability and usefulness of information technologies to increase interactions in a course is a major reason for lack of adoption (Stenhoff, Menlove, Davey, & Alexander, 2001).

There are many technological tools currently being used in online course design including communication tools (i.e., email, audio/phone calls, and instant messaging), social interaction tools (i.e., social media and blogs), document sharing and editing tools (i.e., collaborative documents and file management systems), visual and audio technology tools (i.e., video and podcasting), learning tools (i.e., lecture, textbooks, case studies, online practice, and search engines) (Beldarrain, 2006; McGreal, 2004). Not all types of instructional technology, however, enhance student engagement in an online learning environment. Students have different interaction engagement levels and abilities to use technologies in online learning (Wang, 2007). Understanding online students’ preferences for the use of instructional technologies may enhance engagement and learning.

Purpose and Objectives
The purpose of this study was to identify undergraduate students’ perceptions of technology used to enhance interactions in online learning environments in a college of agriculture and natural resources in Taiwan. The specific objectives of this study included: describe undergraduate students’ preferences for given technologies used to enhance learner-to-learner interactions for online learning; describe undergraduate students’ preferences for given technologies used to enhance learner-to-instructor interactions for online learning; describe undergraduate students’ preferences for given technologies used to enhance learner-to-course content interactions for online learning; and describe undergraduate students’ preferences for given technologies used to enhance learner-to-course technology interactions for online learning.
Methods
A quantitative survey research design was used to measure undergraduate students’ level of agreement with the question: "Is the use of the following technology an effective tool for enhancing interactions with other learners, the instructor, the course content, or the course technology?" The respondents were able to choose multiple responses for each given technology and thirty-one different kinds of technologies were presented in the survey. The population for the study was all undergraduate students (n=362) in the College of Agriculture and Natural Sciences at National Chung-Hsing University (NCHU) in Taichung city, in Taiwan. Approximately 33% of students (n=117) agreed and participated in the study. The theoretical framework used in this study was adapted from Moore’s (1989) transactional distance theory. Transactional distance theory focuses on the relationships between learner-to-learner interaction, learner-to-instructor interaction, learner-to-course content interaction, and learner-to-course technology interaction in the online course and some asynchronous learning environments (Moore, 1989).

Results and conclusions
From a list of thirty-one different instructional technologies, undergraduate students in NCHU had diverse preferences toward technology use to enhance four types of interactions for their online learning. According to the results, instructors should consider utilizing the following technologies in their online course design to enhance learner-to-learner interaction in online courses: Facebook, Line, case studies, audio/phone calls, threaded discussions, role play/simulations, and Skype. In order to enhance learner-to-instructor interaction in online course, the results suggest that instructors should use instructor announcements, lecture, case studies, email, audio/phone calls, PowerPoint, online tutorials, role play/simulations, and Skype. Results also suggest that instructors should use text/textbook, PowerPoint, YouTube, voice over PowerPoint, online quizzes, worksheets, Dropbox, and Google docs to enhance learner-to-course content interaction in online courses. To enhance learner-to-course technology interaction in online courses, the results suggest that instructors should use online quizzes, getting help online, online calendar, online tutorials, and YouTube.

Recommendations, educational importance, implications, and application
The use of different kinds of instructional technology may enhance college of agriculture and natural sciences students’ interactions in an online learning environment. Instructors may wish to consider these findings when developing and delivering agricultural courses and instruction online. Online students may wish to consider these findings as they attempt to overcome interaction and engagement barriers when taking courses online. Because these findings and conclusions may be culturally and/or nationally bound, gaining a better understanding of the appropriate use of instructional technologies in context may help international agricultural education researchers and instructors develop more effective online learning environments. Further, technology accessibility as an influence on learners’ ability to use the technology for online learning needs to be explored. The results may influence agricultural education instructors’ adoption of diverse delivery strategies to improve student interactions in online courses (Stenhoff et al., 2001).
References
Evaluating the Effectiveness of a Farmer Field School in Northern Uganda Through the Adoption of Improved Ox Yokes

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Introduction / theoretical framework / review of the literature
Farmer Field Schools (FFS) originated in the 1980s to train Asian farmers in the use of Integrated Pest Management. The model required a subject matter specialist or extension agent to meet weekly with 20-25 farmers, over a growing season, in a highly participatory learning environment. The reach of FFSs were extended by running Training of Trainer (ToT) sessions, for select farmers, to increase the number of local agents to run schools. Since the 1980’s, FFSs have been used in many countries around the world to disseminate knowledge and innovations on many different topics. This has necessitated modification of the original FFS model. While many studies have been done on the effectiveness of the original model, less is known about the effectiveness of FFSs that use modified formats.

Purpose and objectives
This study addressed the question of whether a modified FFS format used in northern Uganda was effective in causing the adoption of an improved ox yoke and what considerations played a role in adoption. These modifications took the form of shorter, more intensive FFSs and long term support for the FFS participants through Community Based Trainers (CBTs) acting as change agents. In Rogers book, The Dissemination of Innovations (2003), he discusses the value of change agents in spreading knowledge of an innovation but also the pivotal role they can play in the decision to adopt and confirmation of adoption. The objectives of this study were to gather demographic data on the FFS participants and the CBTs, describe the effectiveness of the FFS by assessing the confirming benefits to adopters of the improved ox yoke and to describe the contact between the CBTs and the FFS participants.

Methods and/or data sources
Base line data was obtained from two instruments used by the organization presenting the FFSs. Two new instruments were developed for use during individual interviews with two different subject groups. One subject group included thirty-three farmers (N=101) who took part in interviews that occurred two growing seasons post-FFS. The second subject group included the seven CBTs that worked with these farmers.

Results, products, and/or conclusions
This study found that the modified FFS format used in northern Uganda was very effective in introducing the improved ox yoke, with 97% of the subjects adopting the innovation. The study also found that the activities of the CBT helped in the adoption of the yoke in the early stages of diffusion but the relative advantages of the yoke played a large role in confirming its adoption.

Recommendations, educational importance, implications, and/or application
The results of this study can be used to improve FFS and community support design. It is recommended that further studies be conducted on a long term basis to monitor the continued
adoption as well as diffusion to other community members. Other areas of study would be to investigate the adoption of the improved ox yoke in communities that received FFS training but did not have the continued support of the CBTs as well as the spread of the yoke to non FFS trained farmers. Further studies are needed to evaluate the effectiveness FFSs modified for use with other topics.

References
Experiences of an AgriCorps Fellow in Ghana

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Introduction
In 2012, UNICEF reported that approximately 90% of the world’s children (age 10-14) live in developing countries. Abbi (2003) found 75 percent of those classified as living below the poverty line in developing countries live in rural and agrarian areas and experience a multitude of challenges. As a young agriculturist lacking a direct farming background, I questioned how developing countries survived. Before entering workforce upon graduation, I chose to experience an agrarian society in a developing country. Research by Roberts, Conner, & Jones (2013) shows modern agriculturists no longer have the luxury of hiding behind geo-political borders and ignoring what is happening on the other side of the world. Today’s 21st century graduate needs to be prepared with a global skillset for their future career.

As an AgriCorps Fellow serving as a 4-H agent in Ghana, I was able to explore the need for a dichotomous education system based on the fundamentals of an agrarian society coupled with youth development. According to the United Nations Development Program (2002), 30 out of the 36 least developed countries are found in Africa with Ghana being identified as one of those. In sub-Saharan Africa and the least developed countries, fewer than one third of the secondary school aged children are enrolled in school (UNICEF, 2012). A large number of children on the continent remain out of school.

The low level of education of the labor force constrains prospects for international competitiveness, economic growth and social development in many countries on the continent of Africa (Verspoor, 2008). Agriculture is the principal driving force of the rural economy and, for those developing countries without substantial mineral resources, often the whole economy (FAO, 2002).

Purpose
AgriCorps connects American agriculture professionals to the demand for experiential, school-based, agricultural education in developing countries. 4-H Ghana and AgriCorps partner because while this is the largest youth organization in the country, 4-H clubs are already present in the Ghanaian school system. As an AgriCorps Fellow serving as a 4-H agent in Ghana, I was able to explore the need for a dichotomous education system based on the fundamentals of an agrarian society coupled with youth development.

Methods
As an AgriCorps Fellow, I was placed in Obooho, a rural agrarian village where I served three purposes: 1) Teach Agriculture Education in the local school 2) Serve as a 4-H advisor in the local school 3) Serve as an Extension Agent for the community. As a teacher and ACF, I used the three circle United States Agricultural Education model with the only difference being that 4-
H took the place of FFA. As a teacher, I taught Integrated Science and Social Studies in the equivalence of 6th grade. In Ghana, students are not required to continue their education past Form 3 (8th grade). Even though my students were ages 13-16 and in what we would call the 6th grade, approximately half could not perform basic math, reading, or writing skills. As an ACF, I was to incorporate experiential learning as much as possible to engage my agrarian students. Since these students grew up farming, I was not there to teach farming; however, I was there to meet the needs of rural young people by equipping them with agriculture and life skills to become healthy, critical-thinking farmers and democratic citizens.

**Results**

Knobloch (2003) explained experiential learning in agriculture education as learners performing tasks while solving problems and participating in projects within the real life setting. My experience as an AgriCorp representative allowed me to see the need for more experiences in the educational journey of all students as I observed the techniques of rote memorization methods from my native colleagues in the village school. Our school was blessed with agrarian abundance which allowed lessons to be held in the fields of our school farm as we learned how water moves through soil and compared it to the migration of ethnic groups to Ghana. I saw the self-confidence levels of my students swell as their peers elected them as officers of our 4-H club. In addition, our 4-H club identified the needs in our community and solved them by building composting bins in our school garden.

**Recommendations**

As a visitor to their village, I was not able to solve any issues facing the village, but I am thankful for the learning experience that allowed me to return to the U.S. with a broadened global perspective of agriculture, industrialization, and a better understanding of the importance of youth development through agriculture education. In conclusion, I believe the three circle model could assist those agrarian students in developing countries blossom in their personal and professional development helping their village and nation thrive for generations to come.

**References**


Extension’s Role in Farmer-focused Value Chain Development in Developing Countries

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Introduction
Agriculture-based value chain development is an effective strategy for improving agricultural productivity (World Bank, 2009) and rural development (Marsden, Banks, & Bristow, 2000). Agricultural commodities are moving out of farming communities as raw materials without adding any value in many developing countries. Most of the time, value addition to agricultural products are taking place outside of the farming communities. Due to this situation, rural farmers in developing countries have failed to gain potential income and trapped in poverty. If these rural farmers are organized and directed to add value to their agricultural products, farmers will be able to increase their income and move out of poverty. To address this rural poverty issue extension has to shift its focus from agricultural production to rural development (Ponniah, Puskur, Workneh, & Hoekstra, 2008) and entrepreneurial development (Swanson, 2006). Understanding this entrepreneurial role of extension is the focus of this paper.

Purpose and Objectives
The purpose of this paper is to critically analyze the tasks of value chain development and how extension should engage in each of these tasks to facilitate the agricultural value chain development in developing countries.

Methods
This paper is based on available literature and author’s experience in value chain development related extension work.

Product, Conclusions, and Recommendations
If properly directed, extension could integrate economic, social, natural, and cultural systems for the development of sustainable agriculture value chains. Agricultural value chain development involves six major tasks: 1) organizing farmers, 2) analysis of the production system and existing value chains, 3) resource acquisition and infrastructure development, 4) coordinating market channels and other services, 5) product improvement and quality control, and 6) management capacity building for sustaining the value chain. Extension has to facilitate each of these tasks by integrating economic, social, natural, and cultural systems in the community to generate systemic synergy necessary for sustainable value chain development.

Organizing Farmers
Organizing small-holder farmers into farmer cooperatives is the first step in farmer-focused value chain development. By organizing farmers into cooperatives, small farmers will gain collective purchasing power necessary to acquire resources and services; influence policy changes; and negotiate price and terms. Extension has to play a catalytic role in organizing farmers.
Analysis of the Production Systems and Existing Value Chains
Production systems and existing value chains should be properly analyzed to identify potentials and constraints for the value chain development. Major potentials include farmers’ ability to produce marketable commodity and the consumers’ continued demand for the value added product. The major constraints to value chain development are restrictions to market access, poor infrastructure, lack of resources, and institutional support in developing countries (Trienekens, 2011). Organizing farmers into cooperatives is an effective strategy (Saarelainen, & Sievers, 2011) to overcome many of these constraints. By organizing farmers, extension can integrate the social and economic systems for value chain development.

Value chain analysis is a participatory assessment process involving the target audience (Bammann, 2007). Extension should facilitate organized farmer cooperatives to identify potential value added agricultural products. When the potential of an agricultural commodity is being determined, it is important to analyze the production potential, value addition potential, and the marketing potential of the product to identify a viable value addition enterprise.

Resource Acquisition and Infrastructure Development
Extension has to play a coordination role when guiding farmer cooperatives to work with banks and other institutions for acquiring resources to develop necessary infrastructure for value chain development at the community level. Extension incorporates the social system with the economic system in this process.

Coordinating Market Channels and Other Services
At the beginning of the value chain development, extension has to play a coordination role by helping farmer cooperatives to link with potential markets and other services necessary for the production and marketing value added products.

Product Improvement and Quality Control
Product improvement and quality control of value added products at the farmer cooperative level should be assured for the continued success. Extension should link farmer cooperatives with relevant research institutions to acquire product improvement and quality control knowledge and skills.

Management Capacity Building
Rural farmers need business management skills and knowledge to operate their value added production cooperatives as successful enterprises. Local extension workers should coordinate with relevant resource personnel to provide necessary training for farmer cooperative members to gain management skills and knowledge.

Implications
This paper presents the extension’s role in farmer-focused value chain development.

References
Factors Influencing Interactions of Taiwanese Agriculture and Natural Sciences Students’ Perceptions of Satisfaction, Quality, and Learning in Online Courses

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Introduction
Moore’s (1989) transactional distance theory revealed four main types of interactions that have significant influences on students in an online course or other asynchronous learning environments in which learning occurs at the student’s chosen pace. According to this theory, learner-to-learner interaction, learner-to-instructor interaction, learner-to-course content interaction, and learner-to-course technology interaction, have different levels of influence on learners’ satisfaction and attitudes toward learning increase in and the quality of the online course.

Based on the transactional distance theory (Hillman, Wills, & Gunawardena, 1994; Moore, 1989), Dooley, Lindner, and Dooley (2005) noted that satisfaction, quality, and learning in an online class where best achieved when all four interactions were maximized. These authors also noted that the four types of interactions were equally important and have the same impact on students’ satisfaction with an online class and their online learning outcomes. Chang and Lindner (2013) found that technology could be used to enhance such interactions. However, researchers have documented that different types of interactions may have unique levels of impact on students’ attitudes toward satisfaction, quality, and learning increase (Chang, 2013; Kuo, 2014; Seidel, 2012). Barriers (Harder & Lindner, 2008; Li & Lindner, 2007) to the adoption, diffusion, and use of education technologies may also inhibit interactions.

Purpose and objectives
The purpose of this quantitative study was to identify the influences of interactions on undergraduate students’ satisfaction, perception of quality, and perception of learning increase in online courses. The specific objectives were (a) to identify and describe students’ satisfaction, perception of quality, and perception of learning increase when learner-to-learner interactions are provided during an online learning experience, (b) identify and describe students’ satisfaction, perception of quality, and perception of learning increase when learner-to-instructor interactions are provided during an online learning experience, (c) identify and describe students’ satisfaction, perception of quality, and perception of learning increase when learner-to-course content interactions are provided during an online learning experience, and (d) identify and describe students’ satisfaction, perception of quality, and perception of learning increase when learner-to-course technology interactions are provided during an online learning experience.
Methods
A quantitative survey research design was used to describe and explore undergraduate students’ satisfaction, perception of quality, and perception of learning increase when different types of interactions are provided in an online course. The theoretical framework was based on Moore’s (1989) transactional distance theory. An online questionnaire was used that contained a series of questions related to participants’ online learning and interaction experiences. Participants for this research were undergraduate students in the College of Agriculture and Natural Sciences at [University] in [City], [Country].

Results and Conclusions
The results suggest that the four types of interaction may enhance learners’ satisfaction with the online learning experience, the quality of the online learning experience, and increase in learning in the online course. Among the four types of interactions of Moore’s transactional distance theory, students agree more with the statements that they perceived higher satisfaction with and quality of online learning experiences and that learning increased when learner-to-instructor interaction and learner-to-learner interaction were provided in an online course. And, learner-to-course technology interaction has less influence on students’ attitudes toward satisfaction with and quality of online learning experiences and increased learning in an online course.

Recommendations, Implications, and Application
Transactional distance theory (Moore 1989) posits that learner-to-learner interaction, learner-to-instructor interaction, learner-to-course content interaction, and learner-to-course technology interaction are important to online learners experiencing a quality learning experience. However, based upon the results of this study, instructors should provide increased numbers of opportunities for learner-to-instructor interaction and learner-to-learner interaction in online course design to Taiwanese students to effectively enhance learners’ attitudes toward satisfaction with and quality of learning experiences and increasing learning. Further research is recommended that utilizes interviews and focus groups with online Taiwanese learners in order to capture first-hand accounts related to the impact of all four types of interactions as this could add depth of understanding to the quantitative data.

References


Influence of Smallholder Farmer Groups on the Application of Best Horticultural Farming Practices in Kenya

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Introduction
Horticulture is a major enterprise in Meru County and encompasses production of vegetables, fruits and cut flowers (Meru County, 2014). The export of fresh fruits and vegetables from Kenya targets almost exclusively the European market, thus standards such as EurepGAP present a challenge to the Kenyan horticulture sector. The rising quality control standards have greatly affected the industry (KNBS, 2015). There has been little effort made towards ensuring that the produce complies with required standards. The activities of government agencies involved in regulating the industry are not harmonized and lead to delays and increased cost of compliance (RSA, 2015). Most horticultural smallholder farmers in the County have formed farmer groups to enjoy economies of scale. Penunia (2011) contends that farmer groups can achieve economies of scale by lowering costs and facilitating the marketing of agricultural commodities.

Purpose
The study aimed at examining the influence of smallholder farmer groups on the application of best horticultural farming practices. The objectives were to identify the reasons for farmer subscription to groups and determine the influence of group membership on the application of horticultural practices.

Methodology
The study was conducted in Meru County involving 35 horticultural farmer groups. A cross-sectional survey design was used to address the objectives. Stratified random sampling was used to select a sample of 112 farmers from a population of 1950 and this was considered adequate at 0.05 alpha level (Bartlett, Kotrlik, & Higgins, 2001). A panel of experts established face and content validity of the questionnaire and Cronbach’s alpha was computed using pretest data to ascertain internal consistency reliability (.85). Independent-samples t-tests were used to establish the differences in level of practices application between farmer groups’ members and non-members.

Results and Discussion
The majority of farmers joined farmer groups to gain access to credit facilities from microfinance institutions (4.60), affordable farm inputs (4.59), extension services (4.58), manage risks (4.50) and access to produce market (4.46). Farmers felt that the groups helped in negotiating legally enforceable supply contracts with exporters or processors (M = 4.20), improved member access to agricultural technologies such as improved crop varieties (M = 4.17), sourcing less expensive inputs (M= 4.16), and knowledge on productivity enhancing risk-reducing management practices (M = 4.15). The t-test results indicated that there was a significant difference in the application of practices between groups and non-group farmers, t = 9.48, p = .000. This indicates that farmers who belonged to farmer groups (M =76.49, SD = 4.78) applied the best practices more than those
who did not \( (M = 67.71, \ SD = 8.57) \). The findings agree with those of Nwakwo, Peters & Bolkemann (2009) and Odomenem & Obinne (2010).

**Conclusion and Recommendations**

Producers who belonged to a farmer group were more likely to apply best horticultural practices. Extension stakeholders need to commit more resources towards strengthening and growth of the farmer groups to optimize production costs, stabilize farmer prices and maximize horticultural production.

**References**


Informative Examples of Seed-to-Supper Programs in Caribbean Areas

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Introduction
World population is expected to reach nine billions by 2050. The rapidly increase of the world population will bring a new set of issues related to food security. Development institutions are called to take quick action for strengthening local food systems. Agricultural education is used for its strategic importance in fighting food insecurity. In the Caribbean, agricultural education programs are considered a valid addition to the traditional education. Formal and informal education are used to enhance agricultural skills among students (FAO, 2009; Lindner & Dolly, 2012). Seed-to-Supper programs are free gardening courses that gives beginner, adult gardeners the set of information they need to productively grow a share of their own food on limited budget.

Purpose
The purpose of this study was to trace the actions of four grassroots groups in their path to increase food security in the Caribbean. Groups’ activities were traced in Jalapa, Nicaragua; North Andros, Bahama; Saint Croix, Virgin Islands, and Perth, Guyana.
The example of Nicaragua, traced the actions of the Boulder Jalapa Friendship Association that carried out a development plan that funds residential facilities located near qualified medical facilities. Temporary hospitality is granted to at-risk pregnant women living in rural areas. Women who can await for their delivery and be transferred to a nearby medical facility if complications arise. In addition, the Association has established an agricultural education program that teaches women to grow food from seed and prioritize fresh produce as a part of a budget-friendly and healthy way to build food self-sufficiency for the family (García-Prado & Cortez, 2012).
The example of Saint Croix traced the actions of the Virgin Islands Good Food Coalition that is the result of a joint institutional partnership between Government and University. The program focuses on issues related to school-age children nutrition and local food security. The program includes nutrition education and school-based gardens as educational tools to shorten the distance between children and agriculture (Larsen & Lilleor, 2014).
The example of North Andros traced the actions of the Bahamas Agriculture Institute. The institute has funded North Andros High School with the scope to lead a pilot sustainable agriculture curriculum based on participatory learning, and by encouraging interactions between high school students and the local development institutions related with the international community. The primary goal of the program is fighting food insecurity at the local level via creating and preserving sustainable agricultural gardens (Webster, Ganpat, & Banya, 2008).
The example of Guyana traced the activities of the Central Mahaicony Perth Farmes’ association as they progress on their path to increase their crop and animal yield. Members of the Association have benefited from several training programs organized by the Guyana School of Agriculture, including free training in sustainable farming for two young adults so to encourage them joining the association (De Mendoca, 2017).
Methods
The method uses a qualitative approach to research (Creswell, 2014). The approach consists of an analysis of certain agricultural education programs, which include program mission, goals and protocols. These programs are considered at least important in addressing food security-related issues in the Caribbean areas. This study is based on secondary sources (journal articles, Reports, web pages, conference proceedings, google maps) and first-hand knowledge coming from field explorations in Guyana. Information about the Guyanese case comes from face-to-face interviews with stakeholders from Skeldon, Barbice, and Georgetown, Demerara-Mahaica. Interviews were conducted in August 20017. Sources are corroborated by the opinion of some experts (mostly extension agents), involved in programs’ implementation processes in Nicaragua, and in the Virgin Islands.

Conclusion
Tracing and illustrating sustainable education initiatives in agriculture is a way to trace and illustrate sustainable school systems (Goff, Lindner, & Dolly, 2008). Tracing and illustrating food security education programs is a way to trace sustainable school systems in the Caribbean. Caribbean associations have made a great effort to attract the general attention to food security issues. Food security education programs are perceived as strategic tools to fight hunger. However, programs must be evaluated. The sustainability of the program depends on the fact that the stakeholders will be able to demonstrate the effectiveness of the programs to attract funding and consents also in the near future. More research will be needed in this direction. Currently, programs show ability to attract funding and the necessary attention that may contribute to guarantee the long-term sustainability of such enterprises. The examples identify perceivable signs of a change of the overall interpretation of food security education curricula. Programs are here mainly used to support sophisticated development strategies. These examples suggest seeing the agricultural education program from a wider and less traditional perspective. The illustrated programs have multiple goals but all of them use sustainable agricultural education to reach the long-term goal of food security (Webster, Ganpat, & Banya, 2008). The examples illustrated the institutional intention to increase general awareness of educating about food security-related issues in the Caribbean. Agricultural education programs are conceived in conjunction with international development agencies. The Nicaraguan educational program targeted a specific and particularly vulnerable population. The Bahamian educational program focused on economic development and youth development. The Guyanese program stressed cooperation action between local and international development agencies and tracked the role of local stakeholders in the development process.

Recommendation
The examples sought to champion innovative educational programs for food security education through development, application, and research of collaborative teaching and garden-based learning practices. Through qualitative research methodology, this study is encouraging understanding of sustainable agriculture, and food security. Seed-to-Supper programs search for offering a valid alternative for food security education in Caribbean areas (Pelling & Uitto, 2001). These examples might also serve as useful models when designing gardens for learners in which agricultural training and peculiar interests are shared with locals. Educators will contribute
highly to programs sustainability if properly motivated. Is recommended that collaborative actions will be pursued for program sustainability.

References
Measuring Impact of Training to Facilitate the Implementation of the Food Safety Modernization Act (FSMA) in Honduras

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Introduction
FSMA enables the Food and Drug Administration (FDA) to better protect public health by strengthening the food safety system, switching the focus to preventing rather than relying primarily on reacting to food safety problems after they occur (FDA, 2011). This significant change poses opportunities as well as challenges for small farmers in developing countries who provide product for export and entry into the U.S. The main reasons smallholders do not comply with standards is the lack of human, physical, financial, informational, and network resources (Lemeilleur, 2013, p.160). These issues represent a tremendous need for the FSMA education and training efforts throughout the supply chain (Lupo, 2015). According to Yiannas (2009) food safety success goes beyond traditional training, it requires a better understanding of organizational culture: “you must change the way people do things...you must change behavior (p. 1).”

Purpose and Objectives
The purpose of this study was to measure the impact of an educational training program on worker’s attitudes and knowledge in implementing the FSMA regulations into their production systems. The following research question guided the study: Are different groups (treatment pre, treatment post, control pre, control post) associated with higher scores in attitudes and knowledge? H0: (µTpre = µTpost = µCpre = µCpost), H1: (µ ≠ µ, for at least one group).

Methods
This study utilized a non-equivalent control group design. When using intact groups, groups that are as similar as possible are selected so comparisons can be made between the treatment and control (Trochim, 2006). Two produce plants in Honduras were selected for this study and randomly assigned to control or treatment group. A non-probabilistic convenience sample of workers was obtained. The treatment plant received an educational training workshop, while no training was conducted in the control group. There were two instruments used in this study: (1) knowledge test (true/false, multiple choice questions) based on the FSMA produce safety rule which results in a score from 0-100 points, and (2) attitudinal instrument (7 point Likert-type questions) to measure food safety culture attitudes, divided in 7 constructs (food safety, regulation components, training, social issues, culture, education, and needs). Instruments were developed by the researcher who established validity and reliability. For the attitude instrument constructs reliability ranged α = .64 to α = .82.
Results
A total of 111 instruments were completed, 58 workers participated in the pretest, treatment (n = 27), control (n = 31), and 53 workers participated in the posttest, treatment (n = 23), control (n = 30). Eight one-way analysis of variance (ANOVA) were conducted. Results indicate that there is a statistically significant difference in groups and knowledge scores F(3, 107) = 9.36, p < .001. Assumption of homogeneity of variance was met (p = .106). Tukey post-hoc revealed that treatment post group (M = 82.7, SD = 12.8) is significantly higher in knowledge scores compared to treatment pre (M = 65.7, SD = 18.6), control pre (M = 62.2, SD = 17.4), and control post (M = 58.37, SD = 19.6). On the other hand, related to attitudes, only the food safety construct revealed a statistically significant difference in groups Welch’s F(3, 57.4) = 3.54, p = .02. Welch’s test was used because the assumption of homogeneity of variance was not met (p = .047). Post-hoc comparisons using Games-Howell indicated that treatment post (M = 5.26, SD = .79) is significantly higher in food safety attitudes scores when compared to treatment pre (M = 4.40, SD = 1.16).

Conclusions/Recommendations
Results show that workers increased their knowledge of the FSMA produce rule by receiving training. According to FDA, there is no one-size fits all approach for training, however it is expected that the main outcome of training should be to advance knowledge among the food industry stakeholders to meet FSMA requirements (FDA, 2017). According to Ajzen (2011), investigators typically conclude that knowledge, although necessary, is not sufficient to produce behavior changes. In addition to having the required knowledge, individuals need to be motivated to perform the behavior. Although in the treatment group only the food safety construct showed significant difference, it was observed that the majority of the constructs tended to increase their scores from pretest to posttest. Training should be expanded to cover one topic per session, to allow more focus and application on the other constructs. It is recommended for future research to conduct observational studies to measure behavior and the impact of the intervention.

References

Nutritional Quality of Two Tomato Varieties Costoluto Genovese (Solanum lycopersicum L.) and Wild (Solanum pimpinellifolium) Cultivated in an Aquaponic System

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Introduction
Tomato is the second most important vegetable harvested in the world, and its consumption contributes to human health (Bergougnoux, 2014). Different factors such as the cultivation system and the type of cultivar influence the nutritional composition of the tomato and the concentration of the biologically active compounds (Dumas et al., 2003). In order to maximize production, the tomato crop depends on the application of organic and inorganic fertilizers that determine the final quality of the product. In several areas of Mexico and especially in the state of Yucatan the rural production of tomatoes is carried out in open fields with the incorporation of compost to the soil as a source of nutrients. The high availability of freshwater in the region, in contrast to the scarcity of arable land due to the calcareousness of the zone, has generated interest in other sustainable farming methods.

For some years aquaponics has gained attention as a bio-integrated food production system in addition to closed aquaculture recirculation systems. This aquaponic system uses nutrients from effluents generated by fish farms to cultivate plants in a hydroponic system (Roosta & Hamidpour, 2011). It is a sustainable cultivation method that allows the production of aquaculture and vegetable species, optimizing water consumption and nutrient utilization (Forchino et al., 2017). The final quality of the product, however, is questionable since the variability of the nutrients of the water depends on the metabolism of the fish, their diet and their availability to the plants.

Purpose
The purpose of the study was to evaluate the nutritional quality of two varieties of tomato cultivated in an aquaponic system and to compare the final quality with tomatoes produced in a soil organic system.

Methodology
For the following study, two varieties of tomatoes Costoluto Genovese (CG) (Solanum lycopersicum L.) and wild (Solanum pimpinellifolium) were cultivated in an aquaponic system and an organic soil from August 2015 to March 2016. Cultivation systems were located in the Experimental Unit of the University Marist of Merida, Yucatan, Mexico. A total of 41 CG tomato plants and 42 wild plants were cultivated in aquaponics using the nutritive laminar film technique (NFT) (Rakocy et al., 2006). A total of thirty-five plants were cultivated in organic soil
and irrigated by drip irrigation. The plants of the aquaponic system were foliar fertilized with the following inorganic formula: NPK ratio 29-57-14 until week 10 = and NPK ratio 9-36-55 from week 11 until the end of the experiment. The soil was fertilized with compost before sowing, containing a final nutrient composition of 0.681gP/kg, 100.67gK/kg, 4.22 mg NO3/kg and 0.05 mgNO2/kg).

After 23 weeks of cultivation, the physiologically mature tomatoes were harvested, cleaned, washed, dried and crushed to a uniform mixture of skin, pulp and seeds. The mixture was stored at -20 °C until its subsequent physical-chemical analysis. The acidity of the mixture (%) was determined by acid-base titration with standardized alkaline solution (AOAC method 942.15) (Helrick, 1990). Total soluble solids (TSS) were measured by refractometry. The antioxidant compounds were determined from six ultrasonic extracts (80% MtOH) corresponding to mixtures of 16 CG and 109 wild aquaponic tomatoes and 88 CG and 90 wild organic tomatoes. Total phenols were determined by spectrophotometry at 741 nm using the Folin-Ciocalteu method (Silván et al., 2013). Total flavonoids were determined by the chelation reaction with Al3+ at 415 nm (Moo-Huchin et al., 2015). The antioxidant capacity of the radicals ABTS (2,2'-azino-bis-3-ethylbenzthiazoline-6-sulfonic acid) and DPPH (2,2-diphenyl-1-picrylhydrazyl) radicals were determined spectrophotometrically at 741 nm and 540 nm respectively (Williams et al., 1995; Re et al., 1999).

**Results**

There were no significant differences (p > 0.05) between the concentration of total phenols (TP) and total flavonoids (TF) between aquaponic tomatoes and organic tomatoes. The mean concentration of TP of the aquaponic and organic tomatoes was 2756.06 ± 694.07 and 3369.06 ± 1267 mg GAE/100g dry weight (d.w), respectively. The concentration of TF was 551.30 ± 184.68 mg QE/100g d.w for aquaponic tomatoes and 596.56 ± 121.75 mg QE/100g d.w for organic tomatoes.

The acidity ranged from 0.27% to 0.29%. The TSS was higher in the aquaponic tomatoes (6.97 ± 1.16, p < 0.05) compared to the organic ones. Aquaponic tomatoes showed high antioxidant properties. Although there were no significant differences in antioxidant capacity (p > 0.05), the DPPH radical reached higher values in aquaponic tomatoes (4096.93 ± 519.65 μM TEAC/100g d.w) than ABTS.

**Conclusions and Recommendations**

The acidity, total phenols and total flavonoids of aquaponic tomatoes was similar with organic tomatoes and their composition in TSS is a quality attribute for agribusiness.

**References**


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Introduction
The Agro-ecological Integrated Production System (SIPIA, acronym in Spanish) of the Marist University of Mérida has been an area of practice for students of the Natural Resources Management bachelor program. As part of their professional profile, they are able to develop, promote and implement sustainable production systems. To achieve this training objective, a practical program was designed and implemented based on the SIPIA, where the knowledge and concepts are gradually acquired by the students in a classroom, and practical abilities appropriated. The relations among production units (components), the flow of nutrients and energy, as well as guiding concepts that are within the conceptual frameworks of the academic practices program for the management of an integrated agro-ecological production system (Isla-Esquível, Cuevas-Jiménez & Aranda, 2016). Agro-ecology, organic, and permaculture will allow transmitting it in the agricultural projects they participate in to make proposals that are driven to sustainability.

Purpose and objectives
The purpose of this program is to train environmental professionals with capability to transfer integrated systems of food production in rural communities as a strategy of sustainability.

Methods and Results
During the first two thirds of their career, students take a practice included in this program. The SIPIA is constituted by four subsystems; aquaculture, agroforestry subsystem, organic fertilizers and the livestock subsystem (Jamu & Piedrahita, 2002). System interactions are described below:

The duck-fish subsystem consists of an extensive tilapia production pond (Oreochromis niloticus), which has a platform cage with ducks on the upper part, where their excretion gets into the pond promoting the microalgae development, providing food for the fish. The pond is the main source of water for the agroforestry subsystem, providing water with an important nutritional load. The agro-forestry subsystem has vegetables, fruit, seeds and ornamental plants as the main products. Within these products those that have some partial depredation or do not have an optimal quality for human consumption are reincorporated into the system, used as feed in the livestock subsystem (chicken and/or tilapia) or go to the fertilizers subsystem which is fed by both sludge from the pond and manures of the livestock component, and are incorporated in degradation processes in composts or bokashi to stabilize the material and reincorporate them to the agro-forest subsystem through the soil element. In addition to these interactions agro-ecological controls are applied to control pests and diseases. This complexity of interactions is studied from different subjects. The internship program has been divided into levels as follows:

Stages of initial training (1st and 2nd semester), the student is approached to the agroforestry subsystem making their first organic fertilizer; as a stage of intermediate training (2nd and 4th
semester) students develop projects such as the comparison of animals and vegetables with respect to some variable as solid, dissolved nutrients, or type of food or quantity of water; advanced stages (5th and 6th) carry out agricultural projects in written form based on knowledge learned including economic, social and pollution factors; being this last stage where some students are profiled for the realization of a thesis project to which they will give continuity in its 5th year of the career. In this way we are training professionals to contribute to vocational training so that they in turn transfer integration and synergy benefits in production systems for sustainability and efficiency purposes. Likewise, this program has been shared on a different scale to groups of adolescents at risk of exclusion, programs of employment for young people with special educational requirements and has provided talks and training courses for small producers. One of the limitations is that the practices that are implemented should consider academic times; due production times are different to academic times. The SIPIA adapting its sowing and harvesting times to academic times has managed to maintain its production in the last 8 years between 1,200 and 1,600 kilograms per year which have been donated to associations of assistance to people in need.

References
Ruralization and Urbanization: Sustainability Issues in West Africa

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Introduction and Review of Literature

Investigators (Ahn, Piña et al., 2017; Ahn, Briers et al., 2017) reported serious geographic problems in Ghana, Senegal, and Liberia. Rapid urbanization of Liberia since its 14-year civil war caused significant socioeconomic disparity between female urbanites and their rural sisters. Analysis of 10 years of Demographic and Health Surveys (DHS) revealed that rural communities cannot support proper education, literacy, and numeracy; helpless sisters remain in subordinate roles. Liberian girls are forced to work on farms rather than attend school. Female urbanites have higher education and live as independent decision makers. A relationship was found for better/poorer nutrition, higher to lower wealth index by residence (urban versus rural). Spouses’ education and religious factors also influenced the welfare of women (Ahn, Piña et al., 2017). Urbanization in Ghana and Senegal showed similar trends (Ahn, Briers, et al, 2017). Gaps may widen; people in the countryside often migrate to cities.

Food security assessments (Center on Conflict and Development, 2013) revealed that the prevalence of traditional agriculture techniques in Ghana, Senegal, and Liberia resulted in stagnant crops yields—much lower than world averages. Urbanization will be futile unless the countries achieve food self-sufficiency. The ratio of Liberian food adequacy was 0.52 in 2013; thus, 48% of Liberians go to bed hungry or rely on imported food. In Ghana, better quality, more diversified and attractive marketing strategies, and neat packages of imported rice appeal to urban households.

Purpose

Agriculture is a major but inadequate source of income in rural areas (Sohoulande Djebou et al. 2017). The irony is that Liberian, Ghanaian, and Senegalese smallholder farmers do not have sufficient food and enough nutrients in rainy seasons, although they are who feed the countries. Agriculture is a gift of civilization. It is a living history of the human settlement, the adaptation to nature, and creation of unique cultures. Agriculture is about people and their activities. To accomplish “No Poverty,” “Zero Hunger,” “Good Health and Well-Being,” and “Gender Equality” of the Sustainable Development Goals (United Nations Association—UK, 2017), researchers must tailor and recommend rural and agricultural policies to decision-makers. The purpose of this investigation was to compare rural females to their urban sisters concerning literacy, numeracy, wealth, and education.
Methods
DHS data bases from Liberia, Ghana, and Senegal were used to extract information about women. We used qualitative and quantitative methods to characterize/develop a variable called ruralization. Out of comparisons between rural and urban areas, the researchers subdivided rural villagers into several levels by assets, education, health, and infrastructure and market accessibility. The urban population could settle in downtown, suburbia, and slums. Sanitation, education, infrastructure, and other well-being factors enabled the researchers to examine dwellers in reference groups. Differences in rural and urban assets allowed the wealth index to be expressed as a continuous variables.

Findings
Interpreting historical and agricultural literature confirmed that more than 90% of rural households engage in agriculture. The process guides a big picture of ruralization. Then, a simulation process allowed the researchers to compare rural households. Beyond the wealth, additional variables explain some rural residents are better off in society. A chi-square test for independence was performed to identify an association of people living in the countryside. Not only the DHS but other secondary data, the Food and Agriculture Organization of the United Nations Gender and Land Rights Database and the Living Standards Measurement Survey of the World Bank, support and supplement key findings (FAO, n.d.; Sohoulande Djebou et al., 2017)

Conclusions
Urbanization encourages vertical development (large disparities among levels of income, wealth, and access to services. Ruralization is a holistic and sustainable approach to stimulate horizontal development. (b) Urban centers are most vulnerable to food insecurity unless rural areas supply food. Similarly, food insecurity in urban areas increases when the price of imported staple food increases. (3) Some rural communities are better off in socioeconomic, food-security, and human development status due to theirs proximity to town/urban centers, education of rural female, and diversified crops. (4) Other rural communities can imitate the differences as future strategies. (5) In ruralization, an investment of the target population is critical. ‘Who’ decides in the community will matter.

Implications
The concept ruralization is important to those engaged in agriculture. The key lesson is that urban centers and rural villages should cooperate in sustainable development. Each society must supply and demand a lot for and from one another. Rural communities need not transform into urban areas with urban-like livelihoods. The study leaves a possibility for rural communities’ unique development.

References


Introduction/Theoretical Framework
Servant leadership is key to addressing global challenges of the twenty-first century (Marquardt, 2012). From issues such as economic globalization and sustainable agriculture (Parris & Peachey, 2013) to strengthening relationships in education, business, and international partnerships (Barbuto & Wheeler, 2006), understanding servant leadership tendencies enables leaders and followers to focus on meeting the needs of a global society. Positive and purposeful peer mentor programs could be a helpful link to promoting belonging in a college classroom and addressing issues outside of a classroom learning environment (Elmore & Maxwell, 2008).

Understanding when and where college students seek mentorship and what mentor qualities they desire are crucial for addressing a student’s needs in higher education across the globe (Levine & Dean, 2012). The theory of servant leadership focuses on meeting the needs of followers before the needs of the leader and self, which imitates many mentorship relationships (Daft & Lane, 2011). Due to the attention on focusing feedback from the lens of the follower, Van Dierendonck and Nuijten’s (2011) approach to servant leadership was used to guide the conceptual theoretical framework.

Purpose and Objectives
The purpose of this study was to describe servant leadership traits desired in college students’ personal mentors. The following objectives were used to guide this study:

1. Describe students’ mentorship preferences based on servant leadership traits through the Servant Leadership Survey (SLS).
2. Determine if a relationship exists between previously serving on the college peer mentor team and their mentors’ total servant leadership scores.

Methods
The study used a simple random sample through a survey design (Dillman, Smyth, & Christian, 2014) to describe students’ perceptions of servant leadership traits in personal mentors (n = 35) at the end of the Fall 2016 semester. The target population included students who were enrolled in the college’s Fall 2016 freshmen orientation course and students who previously served or were selected to serve on the college’s peer mentor team from 2015-2017. Students who are selected to serve on the college mentor team experience a mentorship training every August. The instrumentation included the SLS (30 items; Van Dierendonck & Nuijten, 2011) and a researcher-designed, demographic questionnaire. Descriptive statistics were used to analyze central tendencies, and a point-biserial correlation was used to determine the relationship between the total servant leadership score and previous involvement on the college’s peer mentor team (Creswell, 2012).
Results
The mean age of respondents was 20.0 years (n = 35, SD = 2.76) and 86% (f = 30) were female. Freshmen (f = 13) and sophomore (f = 8) students identified stewardship and empowerment as the most frequently found servant leadership traits in their personal mentors, and juniors (f = 5) and seniors (f = 9) identified accountability and stewardship based on the SLS inventory. Students self-selected empowerment, accountability, and authenticity as the most important servant leadership traits desired in a personal mentor. Twenty students (57%) had previously served or were selected to serve on the college’s mentor team. A negative correlation was found between the total servant leadership score and involvement on the peer mentor team, which was statistically significant at p < .05 (ρpb = -.338, n = 35, p = .047).

Recommendations/Educational Importance
The negative correlation between the total servant leadership score and involvement on the peer mentor team merits further investigation. Researchers concluded as a student serves on a peer mentor team, their tendency to rate their personal mentors on those traits lowers. However, if the peer mentors were trained to use servant leadership qualities, could these students possibly rank their personal mentors lower because they have become tougher critics of mentorship qualities? If so, one could conclude these peer leaders have an increased sensitivity to expressing more servant leadership traits in their personal relationships, which could strengthen their leadership consciousness.

Higher education professionals are constantly looking for ways to connect with students across the globe. Evaluating what traits students seek in their personal mentors plays a critical role in understanding how to provide culturally-sensitive programs (Upcraft, Gardner, & Barefoot, 2005). Future employers in all disciplines need highly-qualified applicants, especially in technical and scientific fields, such as agriculture. As such, future research in studying the influence of mentorship in agricultural-specific fields is extremely relevant to agricultural education and extension as the industry seeks to provide a skilled and high performing workforce. Viewing these servant leadership traits through an international lens could also have significant global impacts as placing followers needs before the needs of the leader is becoming a recommended approach in business and education.

References


Spatial-Temporal Analysis of Green Space in Addis Ababa, Ethiopia

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Introduction
The high rate of urbanization is a major challenge in developing countries causing reduction and destruction of urban green space. Local and exotic trees, meant to enhance urban space, have been destroyed due to rapid population growth in Addis Ababa, Ethiopia (Dubbale, Tsutsumi, & Bendewald, 2010). Amare (2008) noted poor management of urban space in the city. Image classification techniques were used to identify land use cover and transformation in Addis Ababa between 1986 to 2006 (Palaniswami, Upadhyay, & Maheswarappa, 2006). Remote sensing is gaining wide application in tracking human land use and changing natural environments including analysis of dynamics of urban green space (Shine & Carr, 2002). Spatial-temporal analysis in this study was based on the theory of supervised versus unsupervised classifications (Palaniswami, et al., 2006; Landgrebe, 2003). These analyses provide evidence which may be used by city planners to better predict and manage changes of in-migration that could impact green spaces.

Purpose and Objectives
The study used satellite images to investigate the status and dynamics of green areas in Addis Ababa to: 1) identify land use cover classes and 2) determine land use cover transformation between 1986 and 2016.

Methods/Procedures
The study was limited to Addis Ketema, Yeka and Kolfe-Keranio due to limited resources. An integrated approach using remote sensing and geographical information system together with socio-economic data were used to collect and analyze historical and recent urban green area change detection. Google Earth, 2016 satellite imageries and a map of parks were sources of information on the major changes observed.

Results
Land use classes identified between 1986 to 2016 were forest, plantation, grass land, cropland, bare land (other land) and built-up land. Built-up land was the largest of all the classes. Forest land was in the northern edges while cropland land was mainly in the southern and southeastern edges of Addis. Analysis of the dynamics revealed a positive net overall change along the three-
time intervals with regards to built-up area and bare land use systems. The positive change in bare land was insignificant (0.3% or 61.6 ha) and was thus merged with built-up land. The positive net changes signified transformation of other land use systems to bare and built-up land. Built-up land had an expansion rate of 6.4% (603.9 ha) over the study period. The rate of transformation of other land cover classes monitored were 5.4% (960.5 ha) of forest land, 9.9% (1769.9 ha) of plantation, 18.3% (3278.2 ha) of grass land, and 16.8% (3017.2 ha) of cropland.

**Conclusions and Recommendations**

This study revealed a declining trend of urban green space (forest, plantation, grass land, cropland, and bare land) while that of the built-up land showed an incremental trend. The trend indicated massive transformation of urban green space to bare and developed areas. This calls for the city and national government to strengthen implementation and enforcement of policies that support conservation and management of urban green space nationally and, locally manage in-migration to minimize the ongoing destruction of green space.

**References**


Technology Transfer-Appropriation Model of an Integrated System of Food Production for Human Development. An Approach in a Shelter of Adolescents at Risk of Social Exclusion

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Introduction
The Marist Experimental Unit (UNEXMAR), of the Marist University of Merida, has developed a system of experimentation and integral management of natural resources, in which it is advised and trained through demonstrative-practical models that promote sustainable development, one of its objectives is to design and evaluate technological optimization strategies in the diversified production of food, from locally available natural resources. An integrated food production system (SIPIA, acronym in Spanish) has been developed, in which agro-ecological principles are integrated. This system is available as a technological package to improve soil productivity, maintaining an environmental balance with crops that satisfy the need for a healthy diet and favor the economy of the participants (Isla-Esquivel et al., 2011).

Purpose
The SIPIA, through its ten years of sustained production, has led to the development of methodologies for its transfer, thus designing a strategy that identifies development opportunities related to realistic projects capable of promoting social and economic improvement in vulnerable groups. The objective of this study is to present a transfer-ownership model that attends to the training and organizational processes as fundamental elements, to present the theoretical approaches on which this model is based, the phases for its implementation and a first approach to its implementation in a community of adolescents in social exclusion.

Methods
The transfer-appropriation model aims at the formation of a work-learning community around the management of a system of integral food production, as a tool for human development; the model is composed of three axes: technical axis, (Flores, 2001, Pullin, 2003), pedagogical axis (Freire, 1973, Gelvis y Useche, 2009, Duch, 2009) and axis of human development (Boltvinik, 2005; Gudynas, 2011; Max-Neef, 1993; Sen, 2000). The pedagogical axis feeds the model with a transforming vision of education, the axis of human development guides the project towards the construction of communities of solidarity that work for the common good and the technical axis, through work-learning, the integration of the two previous axes. The condition for the achievement of the transfer-appropriation process lies in the necessary interrelation between the three axes, the fundamental basis of the model. This proposal is presented as a methodological framework and was implemented in a shelter of young adolescents at risk of social exclusion, in which they live and share experiences of collaborative work within the shelter.

Results, Products and/or Conclusions
Within the scope of this model, human development is seen as the acquisition of sociocognitive and emotional skills to face and overcome the multiple situations of adversity and progress in improving the quality of life. These skills allow the model user to develop positive and adaptive
behavior to overcome and face the demands and challenges of life. In turn, to achieve the appropriation of the SIPIA depends on the performance of the implementation of this model in which five phases are proposed during which the axes that integrate the model: technical, pedagogic and human development are worked in an interlaced way through the collective reflection on the work process.

**Recommendations, Educational Importance, Implications, and/or Application**

The importance of the technology transfer-appropriation model of an integrated food production system aims to develop life skills in the participants, favoring their quality of life. From an educational perspective, this model promotes a transformation in the "being" of the members of the work-learning community, that is, both those who transfer and those who appropriate. The essential characteristic of this model is based on the interrelation of the three axes that comprise it: the technical, the pedagogic and the human development. The daily events during the work-learning process have determined the behavior and appropriation of the adolescents that are in the shelter providing in a comprehensive way the performance of the knowledge acquired in the SIPIA in their daily life.

**References**


The Impact of Purposeful Learning Activities on an International Experience

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Introduction/Theoretical Framework/Review of the Literature

Studying abroad offers life changing and long lasting academic, career, personal, and social benefits for students (Dwyer & Peters, 2004). According to Sutton and Rubin (2004), studying abroad adds value to a student’s academic achievements, along with meeting many other learning outcomes. A study abroad experience enhances student understanding by allowing content to be taught through different teaching approaches (Barron, 2006). According to Berte and Jones (2013), reflective learning enables students’ awareness of their past, present and future actions, along with being able to identify areas that need revised, developed, or altered (Berte & Jones, 2013).

Purpose and Objectives

The purpose of this study was to investigate how purposeful learning activities before, during, and after an international experience in South Africa impact participants’ learning process. The following were the objectives of this study:

1. Describe how purposeful learning activities before the international experience impacted the learning process.
2. Describe how purposeful learning activities during the international experience impacted the learning process.
3. Describe how purposeful learning activities after the international experience impacted the learning process.

Methods

A qualitative methodology was used for this study because it provided a systematic approach that allows for order and understanding (Renner & Taylor-Powell, 2003). The participants in this study were selected based on their participation in the International Leadership Seminar for State Officers (ILSSO) conference. The participants were also enrolled in a University of Nebraska course that complemented their international experience. Seven undergraduate students (three males and four females) participated in the study, and were Nebraska FFA officers for the 2016/2017 academic year. Please note that one of the participant’s data was not included in this study due to a corrupted Word document. Post experience questions focusing on the purposeful learning activities the students completed before, during, and after their international experience were developed and used to collect data from the participants. The purposeful learning activities included pre- experience questions, journaling, photography assignments, and post experience questions. Data was analyzed using the block and file approach (Grbich, 2007), which allowed for reoccurring words and phrases to be identified and categorized into themes. Lincoln and Guba’s (1985) trustworthiness techniques were used to ensure a quality study. Multiple researchers served as a triangulation technique, rich descriptions from the data helped to ensure
transferability (Dooley, 2007), and dependability and conformability was addressed through the use of methodological journaling.

**Results**

Through data analysis of the post experience questions, four themes emerged (preparation for experience, reflection and remembering details, staying focused during the trip, and applying new knowledge to the future).

The pre-experience activities prepared the participants for what to expect while studying abroad (P1; P3; P4; P5; P6). P4 mentions that the pre-experience questions provided a guide of what to expect on the trip to South Africa. P3 found the pre-experience questions allowed for focused thought about the culture and what the people in South Africa do for their occupations. Similarly, P2 found that pre-experience questions helped to keep the focus on learning during the international experience.

Purposeful learning activities provided opportunities for reflection during and after their experience in South Africa (P1; P2; P3; P4; P5; P6). P3 was able to gain much more out of the experiences by taking time at the end of each day to reflect and write in a journal. P2 used the reflective journaling to cognitively process the experiences and better adapt to different cultures. Taking photographs during the experience helped P4 to “go back to those places” and feel the emotions all over again.

Participants were able to stay focused on learning throughout the entire experience due to the learning activities (P2; P3; P4; P5). The post-experience questions were a good checkpoint and kept P5 focused on the path of learning. P3 stated “The exercises are what made the difference of my trip from being a vacation and being a STUDY abroad.”

P3, P4, and P5 indicated that post experience questions helped them to apply new knowledge to their current and future lives. The post-experience questions allowed P3 the time to analyze information learned on the trip and figure out what it can be used for in the future. P2 plans on using what they learned to further their future career.

**Recommendations and implications**

The data from this research shows that purposeful learning activities such as pre-experience questions, journaling, photography assignments, and post experience questions are vital to a students’ learning process before, during and after studying abroad. Purposeful learning activities should be incorporated into the entire International experience and future research should focus on the value of specific learning activities.

**References**

The Influence of Policy on Adoption: A Case Study of Chinese Agricultural Extension

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Introduction
The future of agriculture is dependent on decision-makers that seek to improve and create legislation in order to better the lives of the people (Lamm, Lamm, & Davis, 2017). Agriculture policy is vital to the livelihood of the agriculture industry; from a political standpoint, bargaining and persuasion are the essence of political power, requiring an acute comprehension of the interests of political power, and requires a well-developed understanding of professional and public stakeholders (Heifetz, 2009). Policy is the overarching factor that can either be a barrier or a promoter of change in the agriculture industry (Ekeli, 2005). Revised agricultural policy primarily alters the teaching focus of extension agents, forcing them to address these new referendums (Maiga, Edwards, Baker, Cartmell II, & Jenswold, 2016).

Agricultural policy changes lead to mandated adoption of new ideas (Rogers, 2003). The intricate and often invisible web of interrelationships among the elements of a culture means that a change in one part of a system often initiates a chain reaction of indirect consequences stemming from the direct consequences of an innovation (Rogers, 2003). Privatization of the economic system can be problematic because political reform may result in widening the socioeconomic gap between the earlier and later adopters of a new idea (Rogers, 2003).

Purpose and Objectives
Goldman Sachs predicts that by 2025 BRIC (Brazil, Russia, India, China) economies will account for over half the size of the G6 world economy (Pao & Tsai, 2011). The purpose of this study was to examine the influence of policy on agricultural extension adoption in China as a case. This case illustrates the cause and effect of how political reform from the government caused extension agents to alter local efforts.

Methods
This case study examined an agricultural extension program established by the Chinese government and documented the outcome of interventions (Yin, 2012). This case study was selected to illustrate the cause and effect of policy towards extension agents. Case studies acquire data from archival records, observations, fieldwork, or verbal reports (Yin, 2013). Case studies are vital to provide a multi-perspectival analysis to provide a deeper understanding to the voiceless and the powerless (Yin, 2013). The diversity of case study analysis allows the researcher to not only provide a voice and viewpoint of the people that are affected, but also the importance of the alliances of individuals and their interactions (Yin, 2012).

Results and Conclusions
By the mid-1980’s, China had established extension stations in every rural county and township, and there was an extension staff of over one million agents (Ruifa, Zhijian, Kelly, & Huang, 2009). PAES stations are organized by agricultural sub-sectors that have crop, livestock,
agricultural machinery, aquaculture, and economic management stations (Ruifa et al., 2009). China’s largest crops include rice, wheat, corn, soybeans, and tuber crops (Hui, Er-da, Wheeler, Challinor, & Shuai, 2013). As extension stations continued to expand, they became overstaffed which put a financial burden on local governments (Ruifa et al., 2009).

In the 1990’s the federal government responded to county restraints and overstaffing by creating political reform that changed the role of extension agents. The Chinese government formalized the commercial reforms by classifying agents by their source of funding: fully funded agents (government payroll), partially funded agents (government pays partial salary), and self-funded agents (base salary from commercial payroll and grants) (Ruifa et al., 2009). This change in policy was detrimental to extension agents and farmers because in 2002, Chinese extension agents spent an average of 81 days brings AES to farmers, and township agents spent even fewer days (Ruifa et al., 2009).

A correlation between the amount of time Chinese agricultural extension agents spent educating farmers depended upon the salary funding source; government or commercial (Ruifa et al., 2009). China’s Ministry of Agriculture has had political reform in order to merge extension stations and to centralize administrative rights at the county level. A survey of 7 provinces, 28 counties and 363 PAES stations found that 77% of stations had no project grants, which usually came from the provincial or central government, and 25% were sometimes unable to pay extension agents on time (Ruifa et al., 2009).

**Recommendations**

The implementation of agricultural policies direct extension agents’ programmatic efforts and target audiences. Policy can liberate extension agents to give them more freedom in their relations on the local level, or it can be a barrier that limit agent’s capacity (Ekeli, 2005). Extension systems need to be flexible with personnel when changes in agricultural policy occur. The determination of whether consequences are functional or dysfunctional depends on how the innovation affects the adopters (Rogers, 2003). Extension personnel can become overburdened with delivering too many programs at the same time. A delineation of priority programs is needed along with organizational support in times of mandated change.

**References**


Training USDA Cochran Fellows to Improve Mozambique’s Child Nutrition Programs

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Introduction
Mozambique has transitioned from a post-conflict country to one of Africa’s highest-performing economies (USAID, 2016). Agriculture is the major economy and is characterized mainly by subsistence farming, with commercial lands focusing mainly on sugar, tobacco, cotton and cashew nuts (Zacarias & Esterhuizen, 2015). Its exports reached $700 million in 2014, while agricultural imports were around one billion dollars. Despite this impressive growth, 55% of the population lives below poverty. To reduce poverty and malnutrition where almost one third suffers from food insecurity, it has been recommended the government develop its agricultural sector in alignment with the government’s poverty reduction strategy, and on improving education, infrastructure and health (USAID, 2016). In response to the USDA call for proposals for the Cochran Fellowship Program for the Africa and Middle East Region, a team of researchers from [University] with backgrounds in Agricultural Education, Food Science, and Family Studies were awarded the grant to address issues related to nutrition and agricultural education extension.

Purpose and Objectives
The Mozambican Fellows participated during a two-week training to learn about the U.S. Childhood Nutrition Program. The program provides training to assist countries with developing agricultural systems necessary to meet the food and fiber needs of their domestic populations and enhance trade linkages between countries and agricultural interests in the U.S. The specific objectives of the project were to: 1-identify the individual Fellows’ demographic background; and 2-assess the Fellows’ knowledge on how to improve and enhance child nutrition programs.

Methods
The project occurred January 22, 2017 - February 4, 2017. Upon arrival, the Fellows completed a pre-test instrument to assess prior knowledge for child nutrition initiatives. The three-part survey gathered demographic background in section one, knowledge of nutrition and practices in section two and additional comments in section three. Section two included five point Likert-type style (1=strongly agree to 5=strongly disagree) items that asked questions such as, “Is temperature a key factor in proper food handling” and “I can explain the 4-steps to practicing food safety”. The survey was translated from English to Portuguese, and was then back-translated into English with participants’ responses. The project included workshops with Nutrition faculty and webinars with Food Agriculture Organization (FAO) and USDA Food and Nutrition Service as well as Farmer’s market and public school cafeteria visits. The post-test assessment was similar to the pre-test with the exception of demographic background. Data was analyzed and reported with descriptive statistics.
Results and Conclusions
Participants’ background demographic reflected Mozambique’s Ministry of Agriculture (n=1) and the Ministry of Education (n=3). It was found that most (75%) were visiting the U.S. for the first time. Half reported having the ability to make nutrition and dietary decisions for Mozambique and having an awareness of U.S.’s school lunch programs guidelines. Only one participant self-reported training in child nutrition and food handling. As it related to understanding proper storage (refrigeration) for school cafeterias, all reported no prior knowledge and most (75%), reported not being aware of how to provide food service for children with special dietary needs. When asked the extent to which parents should be involved with deciding what foods their children eat at school, they reported being unsure (M=3.5), as well as understanding temperature being a key factor during proper food handling (M=3). At the end of the program, half reported an understanding for proper storage (refrigeration) for school cafeterias, and being aware of how to provide food service for children with special dietary needs. When asked the extent to which parents should be involved with deciding what foods their child eats at school, it was reported as disagreed (M= 2.7), as for temperature being a key factor during proper food handling, they agreed (M=4.25). It is concluded that participants gained knowledge on the various topics needed to develop a child nutrition program in Mozambique. However, more education needs to be provided regarding involving parents in the discussion along with governmental agencies.

Recommendations and Implications
Recommendations are to continue programs to educate rural and developing countries on child nutrition programs to combat malnutrition, undernutrition and healthy lifestyles. The implications are that continued communication will be effective for supporting the Fellows as discussions with governmental officials occur about the value of nutrition programs. Participants indicated a desire to continue communication with the researchers to:
1-Exchange opinions during program development and the need for updated nutrition research to benefit their country;
2-Gain knowledge about school gardens for food production; and
3-Learn about the components of foods of the USDA’s “Healthy Plate”.

References
Understanding Internal and External Motivation Factors in Youth and Adults Participating in Farm Financial Recordkeeping Workshops in Nicaragua

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Introduction
In 1961, the United States Agency for International Development (USAID) was created by presidential executive order with the goal of foreign economic development (USAID, 2017). Currently, USAID has ongoing projects in more than 100 nations, with the broad objective of improving lives in developing countries through reducing poverty and promoting democracy (USAID, 2017). Started in 1985, USAID’s Farmer-to-Farmer Program (F2F) focuses on connecting US volunteers with technical expertise to farmers and agribusinesses in developing countries through short-term assignments (USAID, 2015). USAID F2F provides overall funding, but volunteer programming is administered through cooperative agreements to partners such as Partners for the Americas (USAID, 2015), the coordinating organization for F2F programs in the Caribbean Basin.

Qualitative data, collected during a Partners for the Americas’ F2F volunteer assignment (hosted by Fabretto Foundation in northern Nicaragua), were derived from participants’ input during farm financial recordkeeping and accounting workshops for youth entrepreneurs, adult farmers, and local agricultural tutors. Prior research in the same communities as this F2F assignment showed about half of the rural population was involved in production agriculture, with many farmers facing extreme poverty and food shortages (Prieto, Gonzalez, & Zazo, 2013). Bacon’s (2005) study focused on coffee production in northern Nicaragua, finding local farmers were interested in learning more because of the potential to improve their families’ lives and provide increased income. Motivations to learn new concepts are not just for adult learners. Milares Forno and Boren (2017) found entrepreneurial activities, agriculture, and work are extremely important to Nicaraguan youth to fulfill feelings of responsibility to family.

In this F2F assignment, researchers were interested in understanding northern Nicaraguan farmers’ motivating factors and if motivations were more internal for adults than for youth, as would be supported theoretically by Knowles’ theory of adult learners (Knowles, Swanson, & Holton, 2015).

Purpose and Objectives
The purpose was to understand youth and adult participants’ internal and external motivators for learning farm financial recordkeeping. This poster describes motivators for learning at volunteer-led F2F workshops in northern Nicaragua in August 2017.

Methods
Using a qualitative case study approach, participants at the F2F workshops (n = 82) were asked a brief set of questions in an informal semi-structured interview format. Youth in the purposive sample were entrepreneurs raising red beans, coffee, and/or bees, whereas adults were agricultural tutors, farmers, or both. Small-group interviews, which occurred after each
recordkeeping workshop concluded, centered on two questions: (a) Why were you interested in learning more about agricultural finances? (b) What motivated you to come to this workshop? Interviews were not recorded; anonymous conversations were orally translated to English by a translator, and field notes were written immediately in English. Not all participants in the workshops chose to participate in the interviews.

**Results**

Responses were thematically similar based on the respondents’ background. Youth identified that they attended the workshops because their tutors told them to attend (external motivation). This result supports Millares Forno and Boren’s (2017) work that Nicaraguan youth had strong family and community ties, manifested by feelings of responsibility, which is an external motivator. As conversations continued, youth indicated an aspiration to implement recordkeeping for their entrepreneurial farm projects so they could make a profit (internal motivation). The workshops were not held during youths’ regular school day, so they had to choose to attend workshops outside of class time. Adult tutors indicated attending the workshop as part of their job (external motivation) and out of a desire to better help their students learn farm finances (internal motivation). Both train-the-trainer workshops were held on weekdays, and the schools had arranged for tutors to abstain from teaching on workshop days. Adult tutors who also farmed, described additional internal motivation to learn more advanced recordkeeping to implement on those farms. This motivation was observed also in interactions during the workshops. Farmers indicated they attended to learn about their farm because improving recordkeeping was important. The word important was repeated in multiple farmer interviews.

**Conclusions and Recommendations**

In general, adult learners, particularly farmers, were more internally motivated to attend workshops than were youth. However, because youth were young entrepreneurs with a vested monetary interest in their agricultural projects, they also described internal motivating factors. This small qualitative case study has limitations in depth and scope. Further research on motivation and other factors that impact youth and adult participation in F2F projects in Nicaragua and other countries is recommended.

**References**


Using a Triple Helix Model to Increase Competitiveness in the Avocado Industry: The Case of Atlixco, México

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Introduction
The agricultural sector accounts for 3.8% of Mexico’s GDP (Günther, 2014). The avocado industry has great competitive potential (Martínez, Espitia, & Valenzo, 2013), but collaboration among key stakeholders is lacking. One problem is the lack of territorial innovation, as supported by regional innovation systems, due to Atlixco’s spatial proximity (Sanchez, 2013), externalities, regional culture, identity, and the process of collective learning in creation and dissemination of innovations (Rogers, 2003). The agricultural sector has a strategic role because of its multiple functions in economic, social, and environmental development. Its output is fundamental to the region’s food security, cost of living, and the population’s real income (FAO, 2009). The region’s problems according to a political, economic, social, and technological (PEST) analysis are a) agricultural activities with low growth; b) poverty of rural families; (c) degradation of natural resources; d) unfavorable economic environment; and e) weak institutional framework (Duché, Bernal, Ocampo, Juárez, & Villareal, 2017). A stakeholder-driven model is needed to stoke and support collaboration among the avocado sector’s key actors.

Theoretical Framework
A review of literature revealed three types of Triple Helix Models [THMs] (Leydesdorff, 2012): a) THM I: Where the state or nation directs the relationships that can be created between industry and the academic sector; however, this model has failed in many countries under socialist regimes; b) THM II: Unlike the previous approach, the practice of laissez-faire dictates minimal intervention by government, and the role of the state regarding innovation is greatly reduced; c) THM III: Knowledge is integrated and complemented by the interactions between and among universities, industries, and the state. We proposed testing THM III in the avocado agribusiness sector to establish strategies for and develop innovative, concerted collaborations among universities, federal agencies, and agro-industry actors (Rujano, Núñez, & Aldrete, 2015).

Purpose
This exploratory study sought to collect baseline data for development of an instrument to test THM III regarding stakeholder collaboration in the avocado industry of Atlixco, Mexico.

Methods/Data Sources
The pilot study’s methodology involved conducting structured interviews with important THM actors (Valdés & Suárez, 2013). Analysis of findings from six interviews, including representation from all three strands, served to develop a formative measuring instrument relevant to the proposed model. After the initial data collection and analysis, independent variables and dependent variables were identified for future testing using Likert scales and
calculating correlation coefficients to describe the magnitudes of bivariate relationships. Variables distilled from the interviews would serve as the basis for further instrument development.

Results
Data collection yielded results for each strand of the helix: a) Government: agricultural support programs exist, corporations are providing financial support to consolidate “green businesses,” public policies are not aligned to producer realities, and available resources do not cover the production cycle needs for commercialization; b) Agro-industries: a constant market has grown during the last years, the region’s product does not fit quality standards to compete globally, a lack of trained staff exists in the region, and innovation to facilitate production is lacking; c) University: institutions are willing to conduct research to increase the productivity and competitiveness of agro-industries in the region, and educational institutions seek to promote trainings for employees.

Recommendations/Implications/Educational Importance
It is recommended to further refine the study’s instrument by using item analysis, including reliability estimates (Santos, 1999), to establish the utility of the instrument’s constructs. Exploring the use of structural equations to validate the graphical model through a causal approach is also recommended (Tejedor, 2004). After further validation and ensuring acceptable reliability, the next step should be to use the instrument to describe and compare the views of a larger group of stakeholders from Atlixco’s avocado industry through a survey questionnaire and random sampling procedure.

It is advisable to establish stronger links between the three actors so each understands their obligations and also seeks to support others in playing their roles in more competitive and productive ways. Innovative strategies are needed to renew and/or adopt technologies and practices, including the recognition of existing socio-cultural norms and how such impacts adoption behaviors leading to change (Rogers, 2003). The clustering of agro-industries may be necessary to increase their global competitiveness and generate territorial advantages to compete in regard to quality, costs, and diversification of products. Actors should be promoted in the agricultural sector capable of activating stakeholder learning and their potential to innovate.

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Using GPS Herding Data as a Teaching Tool in Segou Region, Mali

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Introduction/theoretical framework/review of the literature
The Segou region of Mali is largely agro-pastoral. Crop and pasture growth depend on an average rainfall of 625mm which falls between June and October. Small ruminant production is limited by the availability of crop residues and grazing lands. Smallholders attempt to meet the nutritional needs of ruminants by feeding crop residues during the dry season. The animals are also allowed free access to fields during this period when forage is dormant and nutritive value is low. Further constraints are placed on the grazing choices of the animals by the activities of the herdsmen, often children. The purpose of this study was to investigate the nutritional resources that are available to small-ruminates and to characterize their grazing activities during the late dry season.

Purpose and objectives
1) To describe the grazing activities of small ruminants in the village of Ouendebougou Segou Region, Mali, through the use of GPS tracking and analysis to aid in the understanding of nutrient intake.

2) To describe small-ruminant owner demographics, livestock enterprise characteristics, herd/flock structure, livestock feeding and livestock health practices through the use of a survey of self-selecting livestock owners in the villages of Ouendebougou and Dougoukouna.

Methods and/or data sources
GPS data was collected using i-GotU GT 120 GPS units in waterproof containers were attached to collars placed on two nannies and a ram during a week in June 2017 (end of dry season). GPS receivers logged locations at 1 min intervals. The total time of each daily herding itinerary and the distance traveled in a day by each collared animal were calculated. A land cover map was developed, using, ArcGIS, for the area within a 3 km radius of the village of Ouendebougou to estimate time animals spent on rangeland vs. cropland. A survey data had been collected from self-selected small ruminant owners at an earlier date in both villages. This survey data was translated from French, coded and statistically analyzed to gain a better understanding of animal ownership, herding and feeding methods.
**Results, products and/or conclusions**

The data gathered using the GPS trackers provided information on herding activities which was broken down into time spent traveling, grazing and resting based on known movement velocities of common animal activities. This data was then associated with maps indicating land cover (crop land, rangeland, villages and roads) within the herding areas covered by the animals to determine the amount of time animals spent in their pens, traveling and grazing on forages or crop residues. Visual aids were produced, using similar information from an earlier study in a neighboring region, to present the findings to small ruminate owners during village training sessions.

The data gained from the survey provided a clearer picture of small ruminant numbers as well as the feeds and feeding methods in use. This information will be useful when discussing feeding strategies in future training sessions.

**Recommendations, educational importance, implications and/or applications.**

The results of this study confirmed that the method of GPS tracking used proved to be a practical means of collecting herding and grazing data. Additional collection of GPS data will give a more accurate picture of grazing and herding among small ruminants throughout the year. Training sessions should be expanded to include the herders with age appropriate lessons. Feedback should be sought to develop culturally relevant visual aids.

**References**

Using Photographs as a Tool to Document Outcomes of Study Abroad Experience

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Introduction/Review of Literature
Photographs have been used in both qualitative and quantitative inquiry to document outcomes of programs. A number of studies have documented the benefit of photographs in evaluating programs in international settings (Jordan, Adams, Pawley, & Radcliffe, 2009; Taylor-Powell and Steele, 1996; Townsend, Sylvia, Martin, Metz & Wooten-Swanson, 2009, White, Sasser, Borgren, & Morgan, 2009; and Rockwell, et al., 2008). Findings from these studies suggest that photographs are a valuable tool to 1) elicit information from low-literate audiences, especially when audiences are unable to process written text, 2) to document changes over time on projects like landscape restoration, gardening, lawn care, etc., and 3) to stimulate respondents’ memory emotions and imaginations. According to Rockwell (2012), “photos give face validity to observations and document them in ways no one could dispute, and ultimately became a valued secondary form of data collection for the evaluation team,” (p. 180). Literature is scarce relative to using photographs in the evaluation of study abroad experience.

Purpose and Objectives
The overall purpose of the study was to describe the process of using photographs to document outcomes of the study abroad experience. Specifically, the objectives were to determine how benefits of study abroad experiences can be represented through photographic themes: social interactions, agriculture, cultural diversity, history and student input.

Methods/Data Sources
Throughout the study abroad experience, the researcher took photographs of the country (Ireland), the landscape, the people, activities, and the things the participants saw. Many photographs were taken in order to capture all aspects of the experience and categorized into the themes. All photographs were captured using a Canon EOS Rebel T5 Digital SLR Camera. The photos were arranged into the five different themes: social interactions, agriculture, cultural diversity, history and student input. For each theme, five photos were chosen that best represented the course and study abroad experience.

Based on the analysis of the photographs/themes, conclusions were drawn regarding the impact this study abroad experience has had on participating students. Along with observations and input from the class participants, these results were then used to offer recommendations for future study abroad courses.

Results
The first theme was social interactions. These photographs depict the interactions among student participants and professors. Through these thematic photographs, we saw that the students overcame their differences and had positive interactions with each other, professors, and in-country guides.
The second theme was agriculture. While this may make sense because HORT 499H is an agricultural course. Since this course was designed to include quite a bit of travel, there was an opportunity for students to see firsthand the open farm fields and other agriculture-related activities. Students on study abroad programs that stayed in one location may not have had the opportunity to see Ireland farms.

The third theme was cultural diversity. Many students noticed the accent and colloquial terms that comprise the Irish language and the customs that are different between the United States and Ireland. The photographs chosen for this theme consisted of the people of Ireland, doing everyday things. However, these are difficult items to capture in photographs, but still provides for an understanding of the culture of Ireland’s people.

The fourth photographic theme, history, was easily captured as there are multiple statues, monuments, and replicas displayed throughout the country. Museums throughout the country talked about different aspects of Irish history, especially the museums relating to the Irish Potato Famine.

The fifth photographic theme is one that is specific to this course. Student groups were able to plan a short seminar, and take the class to a particular location. Five photographs captured these experiences.

**Recommendations/Educational Importance/Implications**

While many of these photos could have fit into other themes as well, they represent the interests of students and planning part of the study abroad experience. The photographs selected best represented each of the five themes. However, somebody else looking at the photograph could interpret the meaning in a different way.

Photographs showed that social interactions, agriculture, cultural diversity, history, and student input to the course were benefits to all students and course instructors. They all tell a story of what happened and how target audiences reflect on their experiences. Such memory and reflections will go a long way in documenting program outcomes. Furthermore, photographs can serve as a secondary data to develop programs, strategize evaluation plans and develop data collection tools. Photographs can serve as a communication tool to disseminate information in low-literate audiences. International agricultural and extension educators should take advantage of using photographs as a tool to not only document outcomes, but also to capture various activities that participants experienced.

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Oral Abstracts from the 2018 Annual Conference of the Association for International Agricultural and Extension Education
A Comparative Analysis of Students’ Perceived Agripreneurship Competencies

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Introduction
Equipping students with agripreneurship competencies may be a way to improve food security and livelihoods (Mukembo & Edwards, 2017) and reach the Sustainable Development Goals, such as poverty reduction, decent work, and economic growth. This could be achieved through the integration of agricultural and entrepreneurship education through school-based, agripreneurship projects (Mukembo, 2017). Such integration stands to promote the transfer of knowledge and skills across subjects to solve challenges encountered in the real-world (Beane, 1996; Vars, 2001). For example, students could incorporate knowledge and skills acquired in entrepreneurship courses to recognize opportunities in agriculture leading them to develop viable business ventures for self-employment (Mukembo, 2017). Unlike the traditional lecture method, students taught using a project-based learning (PBL) approach are more likely to acquire and apply such skills to solve real-world problems (Thomas, 2000).

Theoretical Framework
This study was undergirded by Ajzen’s (1991) theory of planned behavior, i.e., “perceived behavioral control, together with behavioral intention can be used to predict behavioral achievement” (p. 184). Although not without debate, “it seems evident that much of what we consider ‘entrepreneurial’ activity is intentionally planned behavior” (Krueger, Reilly, & Carsrud, 2000, p. 413). Entrepreneurial behaviors, similar to other planned behaviors, can be predicted from an individual’s attitudes and intentions (Krueger et al., 2000).

Purpose
The study’s purpose was to assess students’ perceived agripreneurship competencies and their likelihood to become agripreneurs in the future depending on instructional approach: PBL featuring agripreneurship and traditional, lecture-based instruction were compared.

Methods/Data Sources
A quasi-experimental, nonequivalent control group design was used in this study (Campbell & Stanley, 1966). Senior Two students, similar to ninth grade in the U.S. education system, who attended four single-sex, boarding secondary schools (two girls and two boys) in Uganda, participated. A stratified sampling technique was used to select the participants (Creswell, 2014). The strata were based on existing class groupings known as streams (Sukhnandan & Lee, 1998). The students were equally divided into treatment and counterfactual groups. The treated group received training on agripreneurship using PBL and the counterfactual group experienced traditional, lecture-based instruction. Data were collected from 280 students using pretest and posttest questionnaires. ANCOVA was conducted (Cook & Campbell, 1979) to determine if
statistically significant interactions or differences existed between the groups, including differences between sexes.

Results/Conclusions
Three of the study’s six null hypotheses were rejected. For example, a statistically significant ($p < .01$) main effect existed between groups for perceived agripreneurship competencies depending on instructional approach. The treated students had higher adjusted marginal mean scores for perceived competencies than members of the counterfactual group, which implied they benefited from the PBL approach. However, no significant interaction ($p < .05$) was revealed between group and sex nor did a statistically significant difference exist between sexes for students’ perceived competencies depending on the instructional approach, which supported the related null hypothesis.

No statistically significant interaction ($p < .05$) was found between group and sex for students’ intentions regarding their likelihood to become agripreneurs in the future depending on instructional approach, which also supported the null hypothesis. However, significant main differences ($p < .01$) were revealed between groups and the students’ likelihood to become agripreneurs. The treated students had higher adjusted marginal mean scores indicating they were more likely to become agripreneurs than the counterfactual students. Statistically significant main differences ($p < .01$) were found for students’ sexes and their likelihood to become agripreneurs. The adjusted mean scores for males in both groups were higher than for females in either group. Regardless of group, males were more likely to become entrepreneurs. The respective null hypotheses were rejected.

Recommendations/Educational Importance/Implications
A need exists to integrate PBL in the curriculum to increase students’ likelihood of better understanding agripreneurial concepts, including improving competence to apply such to solve livelihood challenges in their communities (Mukembo, 2017). Further, because the females had lower agripreneurial intentions than males regardless of group, additional research is needed on how to engage and inspire females to pursue agripreneurial ventures, i.e., increase their intentions (Ajzen, 1991), if doing such would improve their economic livelihoods (Feed the Future, 2011). Studies should also compare the effectiveness of other learning methods and the objectives of agripreneurship education.

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A U.S. Fellowship’s Role in Shaping Entrepreneurs’ Perspectives on Youth Empowerment in Sub-Saharan Africa

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Introduction
An enduring issue in development (FAO, 2014; Mammino, 2007) is the need to improve youth’s access to and passion for agriculture in many countries, especially in Sub-Saharan Africa (SSA). Youth empowerment efforts in SSA have been imbued with numerous development approaches and shifting global policies (Ahaibwe, Mbowa, & Lwanga, 2013). Approaches stressing youth empowerment recently expanded to include the U.S. Department of State’s Mandela Washington Fellowship (MWF). In 2017, 1,000 young African leaders (Fellows) participated in six week-long Institutes at 38 U.S. institutions of higher education. Oklahoma State University hosted 25 from 17 SSA countries for a Business and Entrepreneurship (B&E) Institute. Nineteen Fellows were current or aspiring agricultural entrepreneurs. The Institute also engaged Fellows in learning experiences stressing youth engagement. They drafted leadership development plans (LDPs) detailing their intentions to cultivate community change through youth.

Purpose
This study sought to evaluate the MWF Institute’s role in shaping the Fellows’ perspectives on youth empowerment.

Methods/Data Sources
We employed Q methodology. Q draws on quantitative and qualitative approaches to explain patterns of thought (Brown, 1980). Q has been championed in program evaluation because it allows stakeholders’ perspectives to be identified and targeted (Ramlo & Newman, 2011). Individuals’ sorting patterns were correlated and factor analyzed. Next, factor arrays were interpreted using naturalistic inquiry.

A tenet of Q is concourse theory. A concourse represents the range of perspectives on a phenomenon as statements (Watts & Stenner, 2013). To create a population of statements, we analyzed participants’ artifacts such as LDPs, drawings, and reflections. The Kellogg Foundation’s (2007) collective leadership framework (CLF) served as a theoretical lens as we analyzed artifacts and identified four theoretical categories. The categories structured the sampling of 36 statements used to facilitate procedures, i.e., the p-set (participants in Q) sorted the statements onto a quasi-normal distribution curve ranging from -4 to +4. The p-set also provided a focus group interview to explain their sorts and offer detailed insights. Scores from individual sorts were uploaded into PQ Method® version 2.35 (Schmolck, 2014). Next, we performed three statistical tests: (1) correlation, (2) principal components factor analysis, and (3) a computation of factor scores. Varimax rotation was used to achieve a simple structure. After analysis, we selected a three-factor solution with a base significance of .42 that yielded negligible correlations among factors and captured 20 p-set members as well as 39% of the total
variance. To interpret factors, we analyzed characteristics, factor loadings, distinguishing and consensus statements, and the focus group interview to draw evaluative inferences (Mauldin, 2012).

Results/Conclusions
Our analysis yielded three factors: Youth Energizers; Youth Advocates; and Youth Visionaries. Nine p-set members loaded significantly on the Youth Energizers perspective. They perceived the MWF Institute (30, +4) inspired them to serve as positive examples through their B&E endeavors (20, +4) to motivate youth. Youth Energizers gained confidence (33, +3) to implement their goals (22, +3). One Fellow detailed his intent to “mentor youth in agribusiness.” Emerging as a mostly male perspective (4/5), Youth Advocates seemed to result from the Institute’s focus on creating change. Its youth-focused activities appeared to help them gain a sense of purpose (24, +3). They were motivated to identify youth problems (19, +4) and to mobilize their social networks (18, +3) to advocate for new policies (36, +2). Youth Advocates had the most concentrated factor loadings. Youth Visionaries’ views were opened to the importance of youth empowerment. One Fellow said that her country “did not have a strong foundation” in youth issues. The Institute seemed to help Fellows operating from this lens develop a vision (28, +4) to address such needs. With a new sense of purpose (24, +3), Youth Visionaries intended to use servant leadership strategies (21, +4) to gain the wisdom (19, +3) needed to empower youth.

Implications/Recommendations/Educational Importance
The Institute played a positive role in shaping Fellows’ perspectives on youth empowerment. As an evaluation method, Q also served as a generative technique to integrate the Institute’s activities and processes to gain a more holistic understanding of its outcomes regarding youth empowerment. Literature (FAO, 2014; Mammino, 2007) has called for development approaches to place a sharper focus on youth issues. Findings here stand to expand the literature by narrating the Fellows’ perspectives that emerged from experiencing the Institute. We recommend development approaches devote time and resources to interact with youth through service-learning and other forms of project-based learning. Findings suggest a greater commitment to youth empowerment can be achieved by building relationships and reflecting on their meaning.

References


Africa’s Preparedness for Integrating Experiential Learning into School–based Agriculture Education Programs

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Introduction
Agriculture has been identified as the cornerstone of many African economies (United Nations, 2013); in most African countries, agriculture is responsible for three-quarters of the labor force (Vandenbosch, 2006). For this reason, higher education and training are critical for the agricultural development and economy of the region (Jambor & Babu, 2016). Agricultural Education and Training (AET) plays a pivotal role in supporting the agricultural labor force through the provision and maintenance of quality education and training to facilitate productive and sustainable agriculture (Kidane & Worth, 2013). Consequently, there are several specialized schools of agriculture focused on equipping future AET specialists and school-based agricultural science educators all over Africa.

African AET institutions are expected to improve secondary and tertiary agricultural education to meet the rising demands in African agriculture sector (Mills & Polizzotti, 2013). Faculty in these teacher education programs bear the responsibility of preparing future teachers to lead school-based agriculture education programs (Rank & Retallick, 2017; Roberts & Dyer, 2004). These institutions usually employ young populations for the preparation of future teachers, and at the same time, they work with youth (Mills & Polizzotti, 2013).

Pre-service agriculture teachers should be prepared using a combination of coursework, early field experience and student teaching (Rank & Retallick, 2017). The effective preparation of agricultural science educators should include providing pre-service teachers with experiences to connect learning to “thinking and knowledge that will be easily remembered and applied later in life” (Knobloch, 2003, p. 31). There are few studies in the region regarding the necessities of agricultural education and training for the African context.

Purpose and Research Questions
The purpose of this study was to identify the gaps in Africa’s education system for AET. Consequently, the biggest challenges that agricultural education and training are facing in the region were identified and researchers determined the importance on agricultural education and training in the region.

Methods
An exploratory mixed-methods design was used in this study; results from qualitative data collection informed the development of the subsequent quantitative measures (Creswell & Plano-Clark, 2011). The research was conducted with 24 young community leaders from 15 African countries participating in a leadership development program at [University]. The group participated in focus group discussions (FGDs) and individual interviews. The recorded interviews and FGDs were transcribed and coded. Surveys were developed based on the
Results

Results for the qualitative portion comprised a list of themes the participants consider important such as: inadequate equipment and unqualified instructors for Science Technology Engineering and Mathematics (STEM), unwillingness of educated professionals to take up faculty positions in agriculture education; outdated materials, laboratories with old science equipment, old textbook editions, lack of ICT facilities, and information centers and libraries.

The quantitative was focused in understanding the state of agricultural education in the region. Fifty-three percent of the community leaders agreed and 27% strongly agreed on the importance of agricultural education. However, a total of 76% of the respondents agreed that agriculture education is not given the necessary credence in Africa.

Conclusion & Recommendations

Introduction

Agriculture has been identified as the cornerstone of many African economies (United Nations, 2013); in most African countries, agriculture is responsible for three-quarters of the labor force (Vandenbosch, 2006). For this reason, higher education and training are critical for the agricultural development and economy of the region (Jambor & Babu, 2016). Agricultural Education and Training (AET) plays a pivotal role in supporting the agricultural labor force through the provision and maintenance of quality education and training to facilitate productive and sustainable agriculture (Kidane & Worth, 2013). Consequently, there are several specialized schools of agriculture focused on equipping future AET specialists and school-based agricultural science educators all over Africa.

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The quantitative data collection comprised of five-point Likert style questions that were analyzed through the Statistical Package for Social Studies (SPSS) V.22 using descriptive statistics to obtain the mean and percentage of responses.

Results
Results for the qualitative portion comprised a list of themes the participants consider important such as: inadequate equipment and unqualified instructors for Science Technology Engineering and Mathematics (STEM), unwillingness of educated professionals to take up faculty positions in agriculture education; outdated materials, laboratories with old science equipment, old textbook editions, lack of ICT facilities, and information centers and libraries.

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Conclusion & Recommendations
The challenges are immense for AET preparation in Africa according to community leaders. While AET institutions in Africa are continually searching for better educational materials and training programs, aimed at improving students’ learning, there is an emphasis in AET education on theory that is often divorced from the contextual realities (Freer, 2015). Updating AET curricula in African institutions with experiential methods may provide pre-service teachers with more practical skills that prepare them more effectively for their work. Future studies need to be conducted in order to understand the agricultural education necessities that each country in Africa is experiencing.

References


Agroecology as a Framework for Socially Just Agricultural and Extension Education: Lessons from Cuba

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Introduction
The field of agricultural and extension education has been pivotal in addressing the paramount challenges of food insecurity worldwide through a variety of approaches that range from the dominant technical rational model to participatory and collaborative learning as emerging alternatives (Pretty, 1995; Chambers, 1990; Rivera, 2001). For development actors, including Holt-Giménez, Shattuck, Altieri, Herren, & Gliessman (2012), food insecurity is not about the scarcity of food, it is about inequality. From this perspective, agricultural and extension educators require new frameworks that are inclusive of the political dimensions of knowledge production. As such, critical praxis alongside participatory learning becomes essential (Meek & Tarlau, 2017). Agroecology has emerged as a systems approach to agricultural education and development that employs a grassroots and farmer-to-farmer model that values the livelihoods and experiences of subsistence farmers through participatory learning (Altieri & Toledo, 2011). In Cuba, the Association for Smallholder Farmers (ANAP) has fostered Agroecology using the farmer-to-farmer methodology of La Via Campesina (Machin-Sosa, Roque-Jaime, Avila-Lozano, & Rosset, 2010).

Purpose
The implications of Agroecology as a framework for socially just agriculture and extension education addressing the wicked problem of food insecurity will be explored in this paper. We draw upon the case of Cuba and their extension and agricultural development system to understand Agroecology and its relationship to the food sovereignty movement, a robust assertion of food access and availability that explicitly includes peoples’ right to access and control resources for sustainable and resilient food system outcomes. Despite calls for reduction in agricultural pollution and the advancement of the rights of farming peasants globally, international extension and education systems have not embraced a participatory agroecological approach (Altieri, 2010; Altieri & Toledo, 2011; Warner, 2008) Critical praxis and participatory approaches towards Agroecology within the U.S. system also remain scant (Meek & Tarlau, 2017). By exploring the case of Cuba, we pose questions to unpack the possibilities for an Agroecological praxis as a promising approach to engendering social inclusivity and cultural resiliency in agricultural and extension education systems.

Theoretical Themes
For Holt-Giménez, et al. (2012), the dominant productionist paradigm informing global food security policy depoliticizes and dehumanizes food production by pushing farmers to depend on corporations’ supply inputs for production, and delegitimizes cultural practices. Conversely, food sovereignty asserts the right to access and control resources that enable communities to grow, cultivate, and consume that which they choose using inputs that are appropriate to their conditions and culture (Wittman, Desmarais, & Wiebe, 2010). Altieri and Toledo (2011) opine that participatory Agroecology education is the most effective method towards engendering food security by fostering a participatory and holistic approach to agricultural education that values the experiences and knowledge of smallholder farmers.
sovereignty (Altieri & Nicholls, 2017; Machin-Sosa et al., 2010; Warner, 2008). Others claim that participation does not go far enough, as agricultural education must incorporate critical pedagogy and praxis (Meek & Tarlau, 2017).

The culture of participation within the Cuban agricultural system is long-standing (Leitgeb, Funes-Monzote, Kummer, & Vogl, 2011). ANAP views the Cuban movement as a participatory and critical “Freirean process” of consciousness raising (Machin-Sosa et al., 2010). Meek and Tarlau (2017) further indicate that within food sovereignty, marginalized groups have a right to define their own food system. In Cuba, food sovereignty and participation varies in definition between Cuban citizens and the government (Leitgeb, Schneider, & Vogl, 2016). For instance, it is not clear how the voices of women have been included in food sovereignty efforts (Machin-Sosa et al., 2010). Thus, questions linger regarding the experiences of women within the Cuban agricultural system.

Conclusions
The dominant paradigm to address global food security remains a technical approach (Warner, 2008), and critical praxis in agricultural extension and education is uncommon (Meek & Tarlau, 2017). A more socially just approach to food security must be informed by a diversity of voices and communities (DuPuis, Harrison, & Goodman, 2011; Meek & Tarlau, 2017). Participatory and critical pedagogies show promise for achieving this goal through Agroecological and Food Sovereignty movement activity. Cuba is one context in which these ideas present possibility for us to learn from, including critical questions regarding the experiences of women within the Agroecological context.

Implications
Food insecurity is growing at alarming rates globally. Now more than ever, we need new and more robust frameworks to address this wicked problem. As we seek to foster justice in our food system, further understanding about pedagogies and impacts of the participatory and critical praxis that underpin Agroecology will help inform international agricultural education and extension practitioners.

References


An Assessment of Professional Development Needs in Andragogy of Extension Professionals in Nigeria

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Introduction/Theoretical Framework
The term “andragogy” was introduced by Malcolm Knowles in the early 1970s, and describes the differences between children and adult learners (Knowles, Swanson, & Holton, 2005). Andragogy focuses on special needs of adult learners, and urges educators to base curricula on the learner’s experiences and interests (Ota, DiCarlo, Burts, Laird, & Gioe, 2006). Extension professionals should be encouraged to use teaching models that have been developed based on research in order to best meet the needs of adult clientele (Extension Committee on Organization and Policy [ECOP] Leadership Advisory Council [LAC], 2007). The theoretical framework used for this study was Knowles et al. (2015) andragogical process model which focuses on investigating the needs of the learner.

Purpose and Objectives
The purpose of this needs assessment was to identify professional development needs in andragogy of Extension professionals in Nigeria. More specifically, the objectives of the study were to:

1. Determine Extension professionals perceived knowledge levels of selected topics within andragogy.

2. Determine Extension professionals perceived relevancy of selected topics within andragogy.

3. Rank the Extension professionals professional development within andragogy.

Methods and Data Sources
Participants in this study were Extension professionals stationed at the head office of Nigeria’s National Agricultural Extension and Research Liaison Services (NAERLS) in Zaria, Kaduna State, Nigeria. The needs assessment instrument used in this study is based on assumptions of andragogy (Knowles, Holton, & Swanson, 2015), and also on the format of an instrument previously developed by Estepp, Thoron, Roberts, and Dyer (2014) and later modified by Sanok et al. (2015). Two 5-point Likert-type scales was used to collect data—one ranging from 1 (low knowledge) to 5 (high knowledge) and another ranging from 1 (low relevance to your job) to 5 (high relevance to your job). The instrument identified 21 topics (andragogy, assumptions of adult learners: adult learner experience, assumptions of adult learners: motivation to learn,
assumptions of adult learners: orientation to learning, assumptions of adult learners: readiness to learn, assumptions of adult learners: self-concept, building on the experiences of adults, characteristics of child and adult learners, collaborative inquiry, cooperative learning process, creating a climate of respect, empowerment of the participants, encouraging active participation of adults, how people think, learning for action/results, selecting and using appropriate teaching methods, the experiential learning cycle, the learning environment, traits of adult learners, and understanding learning styles) related to the principles of andragogy. For each topic, the Extension professional indicated his or her level of knowledge of the topic and the relevance of the topic to his or her job.

A cover letter and research instrument were sent to the 59 Extension professionals in the NAERLS head office, and were requested to return questionnaires within two weeks. A total of 42 completed questionnaires were returned, resulting in a response rate of 71 percent. Descriptive statistics were used to determine the mean and standard deviation of the responses to each item. Mean weighted discrepancy scores (MWDS) (Borich, 1980) were calculated in order to rank the adult learning professional development topics.

**Results and Conclusions**

Respondents’ mean score on perceived knowledge level of professional development topics in andragogy was 2.72 (SD=0.99) out of possible 5.00, while the mean score on perceived relevancy of selected topics within andragogy in relation to Extension professionals’ work was 4.40 (SD=0.78) out of possible 5.00. The adult learning professional development topics that ranked in the top 10 after MWDS were applied were (a) traits of adult learners (MWDS = 9.60), (b) cooperative learning process (MWDS = 9.33), (c) readiness to learn (MDWS = 9.02), (d) how people think (MWDS = 7.71), (e) adult learning styles (MWDS = 8.27), (f) adult learner experience (MWDS = 8.14), (g) characteristics of child and adult learners (MWDS = 8.09), (h) collaborative inquiry (MWDS = 7.72), (i) empowerment of the participants (7.55), and (j) Encouraging active participation (MDWS = 7.42).

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

Based on the Extension professionals’ expressed levels of knowledge about the selected topics in andragogy and the relevance of the topics to their jobs, there is a need for a professional development workshop/program for the extension professionals focused on how to effectively teach/train adult learners based on the principles of andragogy. It is recommended that the andragogical approach suggested by Knowles et al. (2015) be used as a process model when designing and implementing the professional development. Further research needs to be conducted to determine how to best meet the Extension professionals’ professional development needs.

**References**


An Exploration of Agricultural Extension Education Graduate Degree Programs in the U.S.

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Introduction
The county extension programs provided by land-grant universities are great sources of reliable, unbiased data (McDowell, 2001; Seevers & Graham, 2012). Schools and universities are an important piece of educating the public (Seevers & Graham, 2012) and Extension’s role is to serve the educational needs of the public (Fehlis, 2005). Each state has different educational requirements for extension employees, some states only require a bachelor’s degree, while others require a master’s degree to work in extension (Scheer, Ferrari, Earnest, & James, 2006).

Little research has been conducted to understand graduate-level Extension education curriculum within the United States. While Cooperative Extension Service has endured some fundamental and philosophical changes in recent years, the demand for extension education is on the increase. There will soon be a vacuum of trained Extension education professionals because of retirement and the lack of trained professionals to replace them (Penrose, 2017). In addition, new Extension staff often have content expertise but need training related to Extension Education (Penrose, 2017). Therefore, there is a need to know which colleges and universities offer graduate Extension Education programs and their requirements.

The framework utilized in this study is curriculum theory which focuses on the development, implementation, and evaluation of learning plans (Stark & Luttuca, 1997). In this study, universities’ curriculum were evaluated to identify commonalities among Agricultural Extension Education (AEE) programs.

Purpose and Objectives
The purpose of this survey research study was to identify and explore Agricultural Extension Education graduate degree programs within universities in the United States. The research objectives were to:

1. Identify universities offering graduate level degrees in AEE;
2. Determine the core courses required by graduate AEE programs; and
3. Determine the demographics of students enrolled in a graduate AEE programs.

Methods
An initial list of potential universities was provided by B. Rank (personal communication, May 6, 2017) and Acker and Grieshop (2004). Program coordinators/department heads within programs in AEE were contacted due to their vast knowledge and understanding of their program along with their access to student records. Dillman, Smyth, and Christian’s (2009) tailored design method was used to develop an electronic survey instrument and data collection procedures. The questionnaire was developed by the researchers and designed to gain a full understanding of the types of students and courses. Core courses were coded by analyzing course descriptions provided by the
universities’ website. Demographics of students and career choices after graduation were analyzed based on the respondent’s answers to the questionnaire.

Findings
Overall, 17 universities offer a graduate degree, specialization, or certification in AEE. Twelve universities offer a Master of Science Degree and five universities offer a specialization or certificate. The delivery method of courses ranged from being completely online \((n=11)\), completely on campus \((n=6)\), or both online and on campus \((n=11)\). The required number of credits for the degree ranged from 30 to 36 and was often dependent upon type of final project. Fifteen universities offer students the ability to choose either a creative component \((n=11)\) or thesis \((n=15)\) or both \((n=11)\). Two programs offered a course-based graduate degree. All universities required courses with similar content that were organized into these areas: foundations of agriculture and extension education; research including methods, statistics and analysis; program planning; program evaluation; instructional methods; statistics; leadership/administration; communication/public relations/ public policy; and practicum. When looking at student demographics, the largest portion of students enrolled in their graduate degree resided within the state. Career choices after graduation ranged from eleven universities reporting students primarily going into high school settings, and twelve universities reported graduates primarily working within the cooperative extension service.

Conclusion/Implications/Recommendations
This study analyzed each university that offered a graduate Extension Education degree. Students can complete either a thesis, non-thesis, or course-based degree program. Core required credits ranged from university to university. Universities can use these findings to analyze their program and compare it to offerings at other intuitions. These findings also offer the profession the opportunity to have a dialogue about whether or not these content areas are the appropriate ones. Future research should be conducted to extensively analyze the curriculum to gather more of an in-depth understanding of course work in each course rather than the overall curriculum. State Extension Specialists should be interviewed to fully understand the educational needs of Extension personnel. A limitation to this study was all student demographics were provided by email from program coordinators and the researcher did not have access to verify the accuracy of the information provided.

References


An Exploration of the Relationship Between International Agriculture Students and Their Advisors

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Introduction/Conceptual Framework/Review of the Literature
There is a huge influx of international students studying abroad every year, particularly in STEM-related subjects like agriculture (Lee & Rice, 2007). Automatically, it becomes the responsibility of the host university to support the academic needs of these students. Unfortunately, the academic dissatisfaction of international students during their stay abroad have been widely reported (Berry, 2006; Brown & Holloway, 2008), which is concerning for both the student and the institution that seeks to continue to attract talented individuals from around the world. Although the issues have been attributed to cultural differences, this study seeks to determine if other factors are at play as well. More specifically, graduate students work in tandem with their advisors to solve both academic and research problems; hence, it can be hypothesized that the interpersonal dynamics and difference in work style between the pair might have an influence on satisfaction and productivity. The Organismic Socio-Behavioral Perspective (OSBP) (Anderson, Woods-Wells, Amal, & Bass, 2016) was used as the conceptual framework to explore the impact of personal factors, such as expressed identity, has on the individual’s interaction with their environment because it takes into account the complexity of multiculturalism. One way that identity is expressed is through one’s preferred cognitive style for problem solving. According to Kirton’s (2011) Adaption-Innovation Theory, this dimension of expressed identity consists of two preferences along a continuum. One preference is more adaptive and prefers to improve current procedures, while the other preference is more innovative and prefers to change current procedures. Ideally, the focus of the work between the advising pair should be on the given tasks associated with the problem (known as Problem A); however, when a gap in the preferred problem-solving styles exist, the focus may move to managing interpersonal differences (known as Problem B)(Kirton, 2011). The result is that the efficiency and productivity of the pair is diminished because the effort is diverted from Problem A.

Purpose and Objectives
The main purpose of this phenomenological study was to investigate the factors that encouraged or thwart the relationship between the advisor and the international advisee. More specifically, are cultural or cognitive differences present and which is more salient? How are coping behaviors being employed and by whom when differences between the working pair exists? The research questions that guided this study are as follows:
1. What are the characteristics of the student and advisor that are pertinent to the OSBP framework?
2. What themes are consistent with positive versus challenged advisor-student relationships as perceived by the participants?

Methods
The target population consisted of full-time international graduate students with at least one year in an agricultural program and faculty advisors who had experience in advising international
graduate students. The convenience sample were twenty international graduate students and five faculty advisors from a U.S. Institution who took part in this study. All the participants completed the 33-item Kirton’s Adaption-Innovation (KAI) Inventory as a measure of problem-solving style. However, only 14 students and three faculty advisors agreed to take part in the 1-hour semi-structured interview round to glean insights on their perceptions and attitudes of the advising relationship. The interviews were transcribed, matched with the KAI scores, and coded for themes related to factors that encourage or thwart a positive and productive advising relationship.

Conclusions
Conclusions of the study were: 1) there exist a relationship between an individual’s problem-solving style and their expectations for the advising relationship; 2) cultural differences outside academia were not factored into satisfaction with the advising relationship by either students or advisors; 3) acculturation into the host country’s academic culture seemed essential for the academic success of the international students; 4) success of advising relationships were dependent on how much the advisor and the advisee exhibited coping behaviors; 6) acknowledging the differences and developing individualized connections between the advisor and advisee were vital to a successful and productive advising relationship.

Educational Importance and Recommendations
This study seeks to identify strategies to improve the capacity of the agricultural workforce through improving the academic and training environments for international students studying abroad. It is cautiously recommended that advisors should be trained to identify and support the unique needs of their international student advisees, including their preferred style of problem solving. Knowledge about different cognitive styles will help advisors tailor their mentoring approach to be more efficient and edifying. Additionally, future research using matched pairs should be conducted to better compare KAI scores with lived experiences, preferred advising approaches, perceived productivity, and advising satisfaction.

References
Are Latin American Students Thinking Creatively? Evidence from Agricultural Undergraduate Majors after an Internship Program Abroad

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Introduction
In today’s dynamic society, students must be prepared to respond to changes, adapt quickly through the understanding of patterns and connections to produce new and feasible ideas (Tomlinson, 2002). Students’ in the agricultural sciences must meet the demands of the agricultural industry, which faces important challenges to sustain the needs of a growing population worldwide (Andenoro, Baker, Stedman, & Pennington Weeks, 2016). Therefore, a 21st century education is needed, “which includes collaboration, communications, critical thinking, and creativity” (Edgar, Retallick, & Jones, 2017, p. 38).

There is a vast body of knowledge examining gender differences in creativity with contrasting results in patterns and areas of strengths between genders (Kaufman, 2016). Additionally, Helson (1990) identified cultural values, social roles, and sexist thinking as some of the key reasons identified for the lack of creativity by women (as cited in Baer, Kaufman, 2008, p.22). An important reason to study creative thinking is to promote understanding of the human mind, its functioning and development and to point out potentialities that might otherwise go unnoticed (Torrance, 1966, p.6, as cited in Cramond et al., 2005).

Purpose and Objectives
The purpose of this study was to explore the creative thinking abilities of student interns after an internship abroad. The following research objectives guided this study:
1. Describe the student interns on creative thinking abilities
2. To assess the creative thinking ability of students by group and gender
3. Ascertain the relationship between students’ TOEFL scores and creative thinking abilities.

Methodology
A purposive sample (N = 23) was used in this study. Participants were student interns from an [L.A. university] who have come to [U.S. university] in the spring semesters of 2014 (n = 9) and 2015 (n = 13).

The Torrance Test for Creative Thinking Form A (TTCT), measures creativity and is divided in three sections: construct a picture, complete a series of incomplete figures, and drawings based on a set of parallel lines. Content and construct validity, as well as inter-rater reliability, were established by the authors (Torrance et al., 1990). The test was administered and scored in strict agreement with the procedures published by the authors. Data analysis was conducted using SPSS®, p-value of 0.05 was set a priori.
Results
On average, participants were ranked in the 46th percentile of the adult population in the U.S. for the creativity index. Only 39.1% of participants scored higher than the 50th percentile rank. In general, scores were spread towards both ends of the scale. On one hand, only 17.4% scored higher than 80th percentile while 30.4% scored lower than 20th percentile. The percentile scores by construct reflect three out of the six constructs were above or at the national norm: fluency (51st), elaboration (51st), and titles (50th). However, they scored lower than the national norm in the remaining three constructs: Checklist of Creative Strengths (49th), closure (43rd), and originality (38th).
Two independent sample t-test were conducted to evaluate whether student interns creativity scores changed with gender and group. Results indicate there is no statistical significant difference in the students creativity index by gender, t(21) = -.56, p = .6. Furthermore, no significant difference was found when analyze by group t(21) = .75, p = .5.

Recommendations/Implications
In general, student interns from Latin America scored lower in creativity than the U.S. adult population. Despite of its importance, creativity and innovation are rarely included within students’ curricula in Latin America, except in arts programs where it is expected (Guadalupe, 2007).

Student interns’ highest scores were observed in the construct fluency (51st percentile). This construct reflected the number of relevant responses, thus it is critical as all other scores depend on this score. However, their lowest scores were observed in the construct originality (38th percentile), which indicates students produced a larger number of common responses. This study did not find significant difference by gender. Previous research has suggested gender differences in creativity are inconclusive and most likely a result of the individuals’ environment, yet if a qualification is needed, women outperformed men in creativity (Baer & Kaufman, 2008). No correlation was found between TOEFL scores and creativity. Nevertheless, individual’s creativity can be influenced by a person’s bilingual abilities due to inherent benefits of speaking two languages and dynamics of cultural experiences (Lee & Kim, 2011).

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Assessing and Clarifying Institutional Roles for Effective Watershed Management in Trinidad

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INTRODUCTION
Proper watershed management is important for several reasons; the latest to be added and now maybe most important, is to help mitigate climate change impacts. For countries with small landmasses and burgeoning populations, watersheds are increasingly at risk of being negatively impacted. The environment and water supply are particularly vulnerable if no actions are taken to manage them properly. The institutional landscape surrounding watershed management activities in Trinidad is very fragmented, with several institutions appearing to have similar roles and overlapping responsibilities. According to Krishnarayan and Pantin, (2002) the institutional landscape surrounding watershed management, appears to be one that welcomes and supports institutional collaboration, as no single agency lays claim to watershed management. This research investigated the roles of institutions, any hindrances that may negatively influence collaboration and their requirements for effective collaboration in watershed management. Results would indicate what remedial actions are needed as well as if there is need for an overarching institution, which could facilitate institutional collaboration and an integrated approach towards watershed management.

PURPOSE AND OBJECTIVES
This study sought to determine; i) the perceived importance of institutions’ roles in watershed management, ii) institutions’ requirements for conducting watershed management related activities and iii) institutional hindrances faced when conducting watershed management related activities.

METHOD
All the institutions with a role in watershed management in Trinidad were considered for this study. An institutional inventory was created of all the key institutions with some role in watershed management. The inventory developed consisted of Government Ministries, NGOs and Statutory Organisations. Key informant interviews using semi-structured interviews were conducted with representatives from eight key institutions (Forestry Division’s Watershed Management Unit, Ministry of Agriculture’s Research Division, Adopt a River Programme, The Environmental Management Authority of Trinidad and Tobago, The Cropper Foundation, The Institute of Marine Affairs, The Water Resources Agency).

Results were presented as means and frequencies. To assess the importance of the institutional roles, the representatives from the institutions were asked to indicate on a rating scale (4- extremely important, 3- very important, 2- moderately important and 1- low importance) the perceived the importance of their role in watershed management activities. Frequencies were used to report these results. With regards to identifying the necessary institutional requirements for conducting effective watershed management activities, respondents were again asked to rate
on a scale of 1 to 4 (1-no need, 2- little need, 3- necessary and 4- extremely necessary) eighteen suggested requirements considered necessary for institutions to conduct watershed management activities effectively. The mean responses were reported as the results. To assess institutional limitations, respondents were asked to state whether the institution currently faced any limitations regarding the institution’s ability to conduct watershed management activities. If responses were positive, the respondent was then asked to explain what these limitations were.

RESULTS
Five institutions considered themselves as having an extremely important role in terms of watershed management activities, two institutions considered their role in watershed management to be very important and one institution, considered their role to be moderately important. In terms of the requirements for effective institutional collaboration, dedicated staff, the implementation of supporting policies and solving problems through institutional collaboration were rated as extremely necessary requirements. Access to information, interdependencies among institutions with similar roles, institutional commitment, stable institutional structure, adequate funding and staff and opportunity for continuity ranked as the second most necessary requirement. Accountability, opportunity for capacity building, open communication among institutions, ability to adapt to changing conditions and institutional flexibility in terms of decision making were considered as necessary requirements. However, despite these requirements, hindrances were identified. The main hindrances identified by the institutions were lack of staff and funds, “unnecessary bureaucracy” and institutional “red tape”. These served to frustrate as well as delay institutions’ ability to carry out their duties effectively.

RECOMMENDATION
The participating institutions indicated that they perceived themselves to have extremely important roles when it comes to carrying out watershed management activities. However, there were hindrances that significantly affect their ability to carry out their activities. For effective watershed management, the main recommendation is for an overarching framework or policy that would manage the institutions’ and their roles in watershed management activities. Such a framework would classify roles thus reducing overlap, which negatively affect institution’s effectiveness. It would also help to remove some of the limitations institutions face in conducting their activities and assist in ensuring that the perceived requirements be provided.

REFERENCES
Attitudes and Transparency: A Case for Communication

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Introduction
Many consumers are unwilling to trust scientist when GM science information is presented (Funk & Kennedy, 2016) due in part to public perceptions that scientific publishing is biased, research is only being conducted to further a researcher’s agenda, and findings are subject to a researcher’s personal thoughts (Mahgoub, 2016). The use of GM technology has allowed for “herbicide, disease, and pesticide resistant crops… [and] an increase[d] shelf-life and enhanced nutritional content [of food]” (Mahgoub, 2016, p. 5) that can lead to greater global food security. However, consumers around the world do not trust GM science due to concerns about food safety, human health, and impacts on the environment (Mahgoub, 2016). These points of contention call for transparent communication (Rumble & Irani, 2016). The industry can be transparent in their communication efforts, but if consumers do not perceive the information to be transparent they will not trust it or take action. Given attitudes about GM science are polarized, perceptions of transparency must be known about those with positive and negative attitudes toward GM science to drive the development of extension communication that not only transfers transparent research-based science but is ultimately trusted and acted upon by consumers.

Purpose and Objectives
The purpose of this study was to determine if attitudes toward GM science impacted perceived transparency of GM science communication. It was guided by the following objectives: (a) identify individuals with positive, neutral and negative attitudes toward GM science, (b) identify level of perceived transparency perceived by individuals within all three groups, and (c) determine if differences in perceived transparency exist between individuals with different attitudes.

Methods
An online survey was used to collect data from 1,046 respondents’ representative of the U.S. public, age 18 and over, through non-probability sampling techniques. Weighting was applied to compensate for selection, exclusion, and non-participation bias. The survey was researcher-developed, reviewed by an expert panel and pilot tested prior to distribution. Attitude was measured using eight opposing adjectives on a five-point semantic differential scale. Item responses were averaged to create an attitude index found reliable ($\alpha = .96$) with a one indicating a negative attitude and a five indicating a positive attitude. Perceived transparency of GM science information was also measured using 11 opposing word pairs on a five-point semantic differential scale. Item responses were averaged to create a perceived transparency index found reliable ($\alpha = .92$) with a one indicating a negative perception of transparency and a five indicating a positive perception of transparency. Descriptive statistics and ANOVAs were used to analyze the data. Findings were interpreted using Davis’s (1971) convention.
Results
Overall the respondents expressed a neutral attitude toward GM science (M = 2.52, SD = 1.06). Respondents were classified based on the real limits of their attitude scores as negative (< 2.50; n = 530), neutral (2.50 – 3.49; n = 343) and positive (> 3.50; n = 174) indicating the most were negative about GM science. Those classified as positive had a mean attitude score of 4.29 (SD = .53) and negative had a mean score of 1.68 (SD = .51). The overall mean transparency of GM science information index score for all respondents was a 3.12 (SD = .79) indicating respondents were also neutral in terms of perceived transparency. When broken out by attitude toward GM science, the negative group perceived a positive level of transparency of GM science information (M = 3.53, SD = .71). Both the neutral (M = 2.81, SD = .54) and positive (M = 2.52, SD = .76) attitude groups were neutral in their perception of transparency. The differences between the three groups were further analyzed using an ANOVA with statistically significant differences found across all three groups (F = 208.12, p < .01).

Conclusions and Recommendations
Our study further confirms that many consumers have negative attitudes toward GM science. Those with negative attitudes were found to have the highest levels of perceived transparency of GM science information, suggesting high trust in that information. Perceived transparency was significantly different among the three attitude groups. These findings suggest that those in different attitude groups may be accessing information about GM science from different information sources, likely those that align with their existing attitudes.

This study should be replicated in other countries as access to, consumption of, and content of GM science information likely varies from nation to nation. Further research should examine the GM science information each attitude group is accessing and analyze it for any differences in content, frames, and sources. Furthermore, research should examine the perceived transparency of GM science information delivered through extension channels. Understanding the perceived transparency of GM science information is essential to communicating research-based science to audiences within all attitude groups.

References
Barriers to School Garden Program Success: Expert Consensus to Inform Policy and Practice

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Introduction / theoretical framework / review of the literature
Given the international interest and need to increase food security, environmental protection, more secure livelihoods and better nutrition around the world, school gardens programs appear positioned to become more prominent fixtures in educational institutions (FAO, 2010; Hayden-Smith, 2006; Williams & Dixon, 2013), there are impediments that need to be addressed to ensure sustained success. Currently, a large network of support agencies, organizations, and individuals in various sectors provide educational and technical assistance of critical importance to the success of school garden programs (Feenstra & Ohmart, 2012). Diverse stakeholder groups such as international Extension professionals, professional societies, associations for science education, school administration and volunteers, non-profits and local community-based organizations provide important capacity for the sustainment and proliferation of school gardens (Barker, Slingsby, & Tilling, 2002; Feenstra & Ohmart, 2012; Hazzard, Moreno, Beall, & Zidenberg-Cherr, 2011; Ozer, 2007). This collaborative network that would benefit from having the tools to engage in a process to identify challenges and obstacles that are most pervasive, both in their own context and the broader context of the school gardens, to develop synergies among the various support programs.

Although the literature (Barker et al., 2002; Comishin, Dyment, Potter & Russell, 2004; Clay, 1999; Dillon & Dickie, 2011; Dillon, Morris, O’Donnell, Reid, Rickinson, & Scott, 2005; Dyment, 2005; Edward-Jones, Waite & Passy, 2016; Graham & Zidenberg-Cherr, 2005; Hazzard et al., 2011; Kelly & Cutting, 2011; Lugg, 2004; Ogilvie, 2012; Ozer, 2007; Rickinson, Dillon, Teamey, Morris, Choi, Sanders & Benefitield, 2004; Rickinson, Hunt, Rogers, Dillon, 2012; Waite, 2011) outlines a set of obstacles to the success of school gardens, international Extension professionals and their network of key stakeholders must evaluate these results based on the case, intervention or perspective of the study. Those making policy and practice decisions are left to make connections to their own context, which leaves plenty of room for error (Slavin, 2008). To date, expert consensus has yet to be evoked on a scale beyond an individual school garden, and would be paramount in the progress needed to ensure the stability and growth of school gardens.

Purpose and objectives
The purpose of this study was to demonstrate a consensus-driven process to identify the central issues impeding on the sustained success of school gardens. Given the diversity of challenges and stakeholders, the objectives were to determine whether consensus could be achieved and whether a core set of barriers exist.
Methods
This study used the Delphi technique to identify the most important barriers to address that pose significant problems for starting and sustaining school garden programs. The Delphi technique is frequently used in Extension and educational contexts to develop consensus for priorities and objectives that can help guide planning and evaluation efforts of programs (Warner, 2015). The population for this study consisted of key school garden experts that held various roles in school garden programs across the state of [STATE], United States. The group of 76 experts was purposively selected in alignment with best practice for the Delphi technique (Stufflebeam, McCormick, Binkerhoff & Nelson, 2012).

Results
The expert panel reached consensus on seven barriers to school garden success. The results outline practical, logistical and institutional barriers to development and sustainability of school gardens. As the panel of experts represented actors involved in school gardens across the state, it provided a comprehensive and holistic lens to the Delphi process utilizing varied interests, expertise and perspectives. The framework demonstrated a means for integrating the views of various stakeholder groups to achieve consensus on a breadth of issues, highlighting the potential for the refined focus of support programs and organizations both in the United States and in school garden programs globally.

Recommendations, implications, and application
As consensus was achieved, this study shows how a network of key stakeholders that exist in the context of school gardens can work together to clear a path that will better position school gardens for success on a scale beyond the single school garden. The Delphi technique demonstrates a process that can be adopted by international Extension professionals to develop consensus on the assistance needed by school gardens and promote more cohesive support. The results have the potential to inform a strategic framework for Extension professionals and key school garden stakeholders to consistently support gardens across geographic regions. Additionally, potential extension programming opportunities exist using these results, such as training volunteers to address feasible obstacles to provide more capacity in school gardens.

References


Building Capacity in Extension Professionals Through Community Development Education

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Introduction
Community development is critical for the future of rural and urban America. Globalization, technological change and devolution are just a few of the issues impacting both rural and urban communities. In fact, revitalizing rural communities is so important that it is one of the foremost goals of the United States Department of Agriculture (U.S.D.A). In its strategic plan for 2014-18, the U.S.D.A identifies Goal 1 as “Assist(ing) rural communities to create prosperity so that they are self-sustaining, repopulating, and economically thriving.” (U.S.D.A., 2014).

Since its inception, Cooperative Extension has been essential in this particular mission – enhancing communities within the contexts of agriculture and natural resources, community and economic development, family and consumer sciences, and 4-H youth development (Franz & Townson, 2008). Recently, community development has emerged as a central topic within each context due to the “field’s proven capacity to provide solutions to community issues” (Matarrita-Cascante & Brennan, 2012). As a result, there is a need to prepare and train future extensionists, not only in their contextual areas, but also in community development education.

Conceptual Framework
In the early 1900s, rural communities argued there was metrocentric bias in policy making, limiting rural community voice (Summers, 1986). In 1908, President Theodore Roosevelt established the Commission on Country Life to draw national attention to the need to improve rural life. Six years later, Congress passed the Smith-Lever Act of 1914 and created the Cooperative Extension Service. As a result, rural sociology and community development were born, maintaining a significant role in Extension by not only assisting and educating, but also analyzing, planning and innovating in regards to the conditions and necessities of rural America.

Purpose & Objectives
As society continues to be more connected, rural and urban communities are exposed to new and complex issues – increasing the demand for community development expertise within Extension (Calvin, 2012; Leuci, Hodge, & Tharp, 2014). However, when examining community development education, there is very little insight regarding fundamental skills, knowledge, theories and educational practices taught within the academy. As such, the purpose of this exploratory initiative was to provide an educational foundation for the field by examining current community development curriculum, and instructional practices at universities across the United States.
Methods
While the first national study of community development education was conducted in Scotland in the early 2000’s, there has yet to be a similar study undertaken domestically. Therefore, we conducted the first comprehensive study exploring post-secondary community development education within the United States. The study population included all programs within US universities that included the terms “community development” in their program title, mission or vision. Utilizing a mixed methods design, that included survey and qualitative artifact analysis, we examined the educational structures of graduate and undergraduate programs focusing on community development education. This included comparing and contrasting student demographics, instructional strategies, philosophies, programmatic structure, and educational practices across participating universities.

Results
Results indicated that social processes such as communication, leadership, learning, group dynamics, and conflict management were key components within the programs studied. Furthermore, the majority of study programs focused less on general process, and more heavily on specific community needs such as economic development, youth development, or rural community planning. In several cases, programs were more geographically bound, and focused on issues unique to rural or urban communities. Finally, due to community development’s multidisciplinary nature, educational curriculum, philosophies, foci and instruction varied widely.

Educational Importance & Implications
This national exploratory study of community development education has significant implications for current and future Extension professionals. By uncovering the educational diversity among undergraduate and graduate programs, we can begin the broader discussion of what are the salient skills and knowledge necessary for successful community development in today’s rural and urban communities for all professionals – both Extension and community practitioners. What’s more, we can begin to determine whether or not align these fundamental skills, knowledge, theories and educational practices to further strengthen the field. This sets a foundation to connect and diffuse existing innovative practices, curriculum, knowledge and skills that are necessary to face the challenges that continue to arise in today’s ever-changing global society. Just as importantly, we will be able to enhance the education of current and future agricultural & natural resource, family and consumer science and 4-H youth development Extension professionals, furthering their ability to address their community’s needs for the 21st century.

References


Building Professional Development in Haiti that Aligns Critical Thinking Styles and Philosophical Perspectives

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Introduction
The island nation of Haiti suffers from chronic food insecurity and rampant poverty (USAID, 2011). The agriculture sector is key to improving rural livelihoods and decreasing food insecurity (USAID, 2011). Systemic change in the agriculture sector will require the development of human capacity that can think of new ways to solve complex problems faced in the country and around the world (Roberts, Harder, & Brashears, 2016). Haiti’s agricultural universities can play a key role in developing critical thinking skills of agricultural professionals but their teaching strategies must be aligned with how people think critically to do so. As part of this, curricula and pedagogical reform may be necessary as well as an adjustment in faculty teaching philosophies. Professional development for teaching faculty may be needed to begin this process of aligning critical thinking styles with philosophical perspectives to ensure teaching is also encouraging critical thinking.

Purpose and Objectives
The purpose of this study was to explore if critical thinking style influenced Haitian faculty members’ teaching philosophies so professional development could be tailored to encourage critical thinking when developing teaching techniques. The objectives of the study were to (a) identify the critical thinking styles of Haitian faculty members and (b) explore the influence of critical thinking styles on faculty members’ teaching philosophies.

Methods
Data were collected from thirteen faculty member participants during the first session of a faculty development workshop held in Haiti. The in-country training coordinator collected data face-to-face at the beginning of the session. The instruments used for data collection were the University of Florida Critical Thinking Instrument (CTI, Lamm & Irani, 2011) to measure the participants’ critical thinking style and a researcher developed open-ended questionnaire to allow participants to express their teaching philosophy. Data were analyzed using descriptive statistics and qualitative content analysis which is finding meanings of text in a social context (McTavish & Pirro, 1990). The UFCTI is a continuum between information seekers and engagers. Seekers love to learn and are open to opinions of others, they strive for objectivity in the way they look at things and make decisions; while engagers enjoy and look forward to situations where good reasoning is necessary, they are confident in their ability to reason and are good communicators about their thought processes (UFCTI, n.d.).

Results
The quantitative analysis of the UFCTI revealed nine respondents were seekers and four were engagers. The qualitative analysis was conducted prior to the quantitative results. Some key
words such as “transmit or transfer knowledge” were used as indicators of direct communication from engagers; whereas seekers were identified through key words such as “accompany students” or “discover” “new knowledge.” The types of assessment and teaching methods were also used to gather indicators of critical thinking style, such as “research assignments” for seekers and “lectures” for engagers. From the qualitative analysis of the participants’ philosophy of teaching, there were five engagers and five seekers. Two respondents demonstrated both engagement and information seeking behaviors within their teaching philosophies, and one respondent could not be categorized based on the qualitative analysis, as it would be too hazardous to conclude given the shallow depth of the response. The qualitative analysis was then compared to the participants UFCTI score. Ultimately, five respondents’ qualitative responses aligned with the UFCTI indicated style. This is excluding the two that could have gone either way based on their teaching philosophy and the one left without a definite style. In reality, only three respondents had completely different results when analyzed quantitatively versus qualitatively. In conclusion, teaching philosophies did appear to have a link with critical thinking style. It is important to note this research was exploratory and the results should be used with caution and should not be generalized. This being said, it can be inferred that faculty members’ critical thinking styles may be used to improve professional development focused on building teaching philosophies that will encourage critical thinking.

**Recommendations**

It would be prudent to further investigate the connection that may exist between teaching philosophy and critical thinking style and whether faculty members from public or private sectors have different profiles. Given the importance of critical thinking for success and Haiti’s need for food security, it could be interesting to study the critical thinking styles of other successful stakeholders in the Haitian agricultural sector. This study also indicated faculty professional development efforts should provide trainings that address both engaging and seeking skills, and teaching philosophies for the educators by integrating the notions of information seeking and engagement behaviors.

**References**


Challenges and Opportunities for Managing Green Space in Addis Ababa, Ethiopia

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The quality and viability of cities depend in part on the management and maintenance of urban green space to fulfill its role as an important social and visual focus. These urban green spaces are comprised of public and private open spaces covered by vegetation (Cohen, Inagami, & Finch, 2008) and are an important component in housing, business, leisure, and commercial development (Abebe, 2009). In Addis Ababa most of the exotic and local tree species grown to enhance the green space and to protect the natural environment have been destroyed or degraded due to rapid population growth (Dubbale, Tsutsumi, & Bendewald, 2010). Further, urban pollution and rapid population expansion (Amare, 2008) have had a deleterious effect on green space. Very few studies have been undertaken to unveil the challenges facing management and protection of green space in Addis Ababa and therefore, this study intended to fill that gap.

The foundational theory behind green space management is the moral relationship between humans and the natural environment, known as environmental ethics (Leopold, 1949). This theory argues that the relationships between people and land are intertwined: care for people cannot be separated from care for the land. Pickett et al. (2001) proposed an integrated human ecosystem framework for analyzing urban systems in relation to their social, biological and physical aspects which consist of two interconnected parts namely; the human-social system, and the resource system.

Purpose and Objectives
The purpose of this study was to explore the challenges facing management and development of green space in Addis Ababa. The objectives were to; 1) identify the challenges facing management and development of green space in Addis Ababa and 2) determine the perceptions of urban residents regarding management and development of green space in Addis Ababa.

Methods and Data Sources
The study was conducted in Addis Ababa, Ethiopia. A mixed-methods research design was used to assess the challenges facing management and development of urban green space in the city. The quantitative sample of 106 households selected through a proportionate stratified random sampling procedure provided data for this study. Primary data were collected through the combination of face-to-face semi-structured interviews, a structured questionnaire, non-participant observations, and focus group discussions. The recordings from interviews and focus groups were transcribed. The research rigor was achieved through credibility and corroboration
(Creswell, 1998). A panel of experts was used to ensure content and face validity of the research instrument. Quantitative data were analyzed via SPSS by use of descriptive statistics.

**Results and Conclusions**

The majority of the respondents (65%) were male, most of whom (51%) were aged between 30 and 49 years of age, and unmarried (55%). The majority of the respondents (51%) held the first degree and above, and had (57%) an income of between 2000 and 3999 Birr/month. The study established that urban green space in Addis Ababa faced by many challenges. First, there was poor implementation of government policies that would guide proper management of green space. Such policies included the supreme law, environmental policy, national growth and transformation development strategy, and climate resilient green development initiatives. Second, illegal settlement, especially in open spaces threatened green space expansion. Third, the participation of urban dwellers towards the management of green space was very low due to lack of involvement in citizen decision making. Fourth, urbanization and population growth posed a big challenge to proper management of green space in the city. As the population increases the need for housing and infrastructure also increases and this adversely affects the city’s environment and valuable green spaces. Finally, the city lacked qualified and committed professionals to better develop and manage the green space due to budget constraints. The study concluded that population pressure, illegal settlements, poor implementation of government policies, low level of community participation, lack of budget and skilled manpower, lack of ownership and coordination among different stakeholders are among the reasons which have largely contributed for improper management and inaccessibility of green space in the city.

**Recommendations**

To improve the management of the urban green space in the city; the government needs to initiate awareness creation activities to equip city dwellers with capacity to engage in the green space decision-making process, provide a sufficient budget and skilled workforce, improving accessibility of green space, and improve the enforcement of government policies and strategies that guide management and development of green space.

**References**


Introduction
While international agricultural and extension educators have conducted studies in Malawi (Mattocks & Steele, 1994; Sigman, Chibwana & Matenje, 1994), inquiries into Malawian Extension are void in our literature. Malawi adopted the District Agricultural Extension Services System (DAESS) in 2006 as a strategy to implement a new Extension policy named “Towards a pluralistic and demand driven extension services” (Masangano et al., 2016, p. 2). The DAESS is Malawi’s agricultural innovation system and places structures at different levels of the district. At the lowest level is the Village Agriculture Committee which reports to the Area Stakeholder Panel (ASP) and the ASP reports to the District Stakeholder Panel. These three structures are best described as innovation platforms in agricultural innovation systems.

Innovation-decisions are decided by a majority of organizational members (Rogers, 2003). The focus of agricultural innovation systems is the promotion of collaborative governance amid various actors (Klerkx et al., 2010, Knickel et al., 2009). Agricultural innovation systems are a relatively new concept in implementing rural development programs versus the popular transfer of technology model which is seen as less relevant to the current socio and economic situations of the world (Pamuk et al., 2014).

Purpose and Objectives
This study sought to assess collaborative governance in the three innovation platforms which are implementation strategies of the DAESS. All the three innovation platforms have various stakeholders represented including farmers as members. This study forms part of a larger study that investigated the agricultural innovation system in Malawi.

Methods and Data Sources
A qualitative design implementing a case study approach was used to collect data in selected districts. Key informant interviews, focus group discussions and observations were used to collect data in five districts. The five districts were purposively selected based on the knowledge...
of their performance and non-performance in implementing the DAESS (Denscombe, 2010). The data was compiled using field notes and audio recordings. The researchers utilized an integrated collaborative framework to conduct the assessment (Emerson et al., 2012). The focus was complex social dynamics occurring in innovation platforms categorized into three aspects which are principled engagement, shared motivation and capacity for joint action and collaborative actions. Qualitative data was transcribed into narratives (Bailey, 2008). Transcripts were used to identify themes, linking themes and identifying thematic clusters, and producing a summary table of superordinate themes (Lyons et al., 2016).

**Results and Conclusions**

Results have been presented following the three complex social dynamics of Emerson et al.’s 2012 framework as indicated in the methodology. Anecdotes have also been used to illuminate some findings while as the rest of the results have been presented in prose. The results showed that at each level of the innovation platforms, there is a desire to promote collaborative governance with various actors. Including issues that seem to have an effect on implementation of collaborative governance, the following stand out; the differences among actors in terms of their resource endowments, sizes and reach of the organizations, the visions, missions and mandates, understanding, interests, trust and ability to sustain the collaboration contributed to how the collaborative governance works out. Politics and power plays were also found to be at the center of influencing collaborative governance in the innovation platforms. Further, over time collaborative governance initiatives seem to be applied in certain situations and not others. Actors choose when to apply collaborative governance initiatives when it suited their situation and not as a habit to collaborate as such individualistic approaches to delivery of extension are still dominant.

**Recommendations**

There are specific complex social dynamic issues that must be addressed to achieve sound collaborative governance. Differences between individuals in terms of their resources, sizes, visions, missions and mandates, understanding, interests, trust and ability to sustain the collaboration contributed to the success of collaborative governance. Collaborative governance should be ingrained in the organizational culture of Malawian Extension and not as a single occurrence. Embedding this new philosophy will require routine training and development of personnel and involving farmers more in planning (Masangano et al., 2016).

The role of innovation-decisions (Rogers, 2003) in the DAESS should be examined. Future research should focus on isolating each innovation platform for assessment separately as making arguments for a summary of three different innovation platforms is a challenge. Research is needed to best understand power play paradigms in order to develop solutions that enhance collaborative governance in innovation platforms regardless of organizational politics.

**References**


Common Goals, Different Cultures: Exploring Volunteer Development in Ghana and the U.S.

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Introduction & Review of the Literature
Professionals from established extension systems participate in exchanges to provide advice on how to respond to local needs in other countries. 4-H Youth Development, the youth outreach program of extension services in the United States, has expanded into over 50 countries in part because of these type of exchanges (National 4-H Council, 2017). Yet, a professional’s advice is influenced by the way he or she has constructed understanding from experiences in a different culture (Sigelman & Rider, 2009). The 4-H positive youth development (PYD) framework has been refined in the United States since the organization was founded in 1902 (Uricchio, Moore, & Coley, 2013). However, limited data were available regarding applicability of the formula in an international context as 4-H has been introduced in other countries.

Purpose
The purpose of this oral presentation is to present and compare findings from two research studies exploring adult 4-H volunteers in Ghana and Ohio, U.S.A. Adult 4-H volunteers foster relationships with youth, and are one of three key inputs of 4-H’s PYD framework. These three inputs, when combined, are hypothesized to support six developmental outcomes that youth acquire as assets, and to result in youth who are less likely to engage in risky behaviors (Lerner, Lerner, & colleagues, 2013). Volunteers, therefore, need to exhibit competence in essential knowledge, skills, and abilities in order to achieve positive youth development outcomes (Schippman et al., 2000). The presenters will introduce 4-H volunteer competencies recently determined by stakeholders in each location, and discuss how cultural contexts may have influenced differences in the taxonomies.

Methods
A descriptive, cross-sectional study using a mixed-methods research design was commenced in Ohio. 4-H stakeholders, including volunteers, county professionals, and families, responded to an online survey about the Volunteer Research Knowledge Competency (VRKC) Taxonomy currently used to guide volunteer development. The survey collected importance and performance ratings using Likert scales, and qualitative answers to open-ended questions. Competency categories included: Organization, 4-H Program Management, PYD, Education Design and Delivery, Communication, and Interpersonal Characteristics (National 4-H Council, n.d.).

An exploratory study using a mixed methods research design was commenced in Ghana since 4-H Ghana did not have an existing competency taxonomy. A purposive, convenience sample of 4-H stakeholders, including volunteers and staff, participated in a nominal group technique to draft a list of competencies. This list was then formatted into a paper collection instrument and
distributed to 4-H stakeholders across the country to validate. The instrument collected importance and performance ratings using Likert scales, and qualitative answers to open-ended questions.

**Results**

10,771 responses were received from the Ohio census survey for an overall response rate of 24.4%. Importance means for all competencies were greater than 4.00 based on a five-point Likert-type scale. Respondents believed all six competencies ranged from important to very important for volunteers to possess. PYD and Interpersonal Characteristics were rated as the most important competencies when listed in rank order by means. A plurality of qualitative comments was coded as personal traits, which supported the high importance means of the Interpersonal Characteristics competency.

Nine 4-H Ghana stakeholders participated in the nominal group technique and generated seven competency categories. Categories included: Interpersonal Characteristics, Experiential Learning, Resource Management, Club Management, Knowledge, Communications, and PYD. 74 responses were collected in-person by a researcher using a paper instrument across Ghana, which represented approximately 6.7% of the total 4-H Ghana stakeholder population.

Stakeholders rated all of the competencies generated through the nominal process as important to highly important on a five-point Likert-type scale (importance means all greater than 4.00). Interpersonal Characteristics and Knowledge were rated as the most important when listed in rank order by means.

Data on perceived performance ratings were also collected using five-point Likert-type scales to prioritize the competency categories for future interventions. These results will also be briefly shared during the presentation.

**Implications**

Results from the Ohio study suggest the VRKC should continue to be used to identify, train, and evaluate volunteers in order to achieve 4-H outcomes. Results from the Ghana study generated a list of similar competencies. Similarities between the two lists suggest that the involvement of adults in 4-H’s PYD framework has relevancy in a unique cultural context outside of the U.S. where 4-H is present, specifically in Ghana. Yet, variations in the lists reflect ways in which 4-H is implemented differently in Ghana compared to the U.S. These differences suggest that cultural contexts may necessitate some modifications in the training of adults in order for them to foster PYD outcomes in their youth.

**References**


Introduction / Theoretical Framework / Review of the Literature
Hurricanes are amongst the most devastating disasters experienced by Caribbean countries. The increasing frequency and range of natural disasters, coupled with the intensified levels of vulnerability in the Caribbean, demonstrates the need for sustained regional efforts to confront the challenges brought on by climatic hazards in the region (Kirton, 2013). Crisis prevention follows a five step process in which sources are identified to scan, information collected, data analyzed, prevention action taken (if necessary), and effectiveness of threat reduction evaluated (Coombs, 2015). The first three steps of the process provided the framework for guiding the present research. No prior research was found on communication with farmers post-disaster in the Organization of Eastern Caribbean States (OECS).

Purpose and Objectives
This study is part of a broader research project that sought to assess the readiness of the various extension organizations in the OECS to deliver on the expressed needs of vulnerable farming communities post-disaster. The present objectives focused on were to describe communication methods used by extension officers with farmers and communication methods used and preferred by farmers.

Methods and Data Sources
A non-experimental, ex post facto design was used. The target population consisted of extension officers and farmers in Grenada, St. Vincent, St. Lucia, Dominica, St. Kitts, and Antigua. The sample population was 76 extension officers and 458 farmers. Data were collected from farmers within the period June to December 2015 with assistance from extension officers in each island. The survey instruments were adapted, with permission, from an instrument used by Telg et al. (2008) to examine post-disaster communication in Florida.

The convenience sample consisted of officers from each administrative district and the Head of the extension service in each country except for St. Kitts, where the researchers experienced some difficulties accessing extension officers. The survey was administered with staff members present at monthly staff meetings in St. Vincent ($n = 18$), St. Lucia ($n = 17$) and Grenada ($n = 12$). In Dominica ($n = 15$) and Antigua ($n = 14$), an extension officer administered the survey to
fellow officers based on visits to the main officer during a one week period in the month under review. The officers’ survey instrument comprised four sections with fixed response options: staff personal needs post-disaster, professional needs, communication efforts, and demographics.

Farmers were chosen proportionately from the agricultural districts in each surveyed island; namely Grenada \((n = 99)\), St. Vincent \((n = 95)\), St. Lucia \((n = 64)\), Dominica \((n = 101)\), St. Kitts \((n = 50)\), and Antigua \((n = 49)\). All farmers were surveyed on their farms. The farmer instrument had five sections with fixed response options: needs and assessment of support provided after a disaster, farmer group involvement, preferred communication methods, barriers to accessing resources, and demographics.

The use of convenience sampling may result in the data not being generalizable to the entire populations of interest.

**Results and Conclusions**

**Methods of Communication Used by Extension Officers**

Extension officers reported most commonly using on-site visits \((63.2\%)\), the telephone \((43.4\%)\), and face to face communication \((40.8\%)\) methods. During a hurricane or other disaster, mass media was used to a slight extent \((36.8\%)\) or not at all \((15.8\%)\). Only \(7.9\%\) of officers indicated they used mass media to a great extent, while \(19.7\%\) of officers reported moderate usage.

**Methods of Communication Used and Preferred by Farmers**

Farmers were asked about the communication methods they used post-disaster as well as their preferred methods of communication. Most of the farmers \(83.3\%\) received information from radio public service announcements (PSAs). Some \(36.2\%\) of farmers identified the extension staff as their information source with \(27.1\%\) of farmers receiving information from the Disaster Preparedness Organization. Fewer than \(10\%\) of farmers received information from the Internet, e-mail, or text messages, respectively. Farmers preferred radio PSAs \((76.2\%)\) while \(24.4\%\) of farmers preferred receiving information directly from extension.

**Recommendations, Educational Importance, Implications, and/or Application**

The capacity of the extension organizations in the OECS has to be strengthened to enable offices to prepare and disseminate information through the mass media, mainly radio PSAs. Extension officers will require training in the development of clear, precise, and impactful messages as well as becoming knowledgeable on how to access radio stations in crisis times so as to best meet farmers’ needs. Farmers will continue to be underserved by extension organizations if no actions are taken in this regard. As such, the data from this research should be used to develop a comprehensive information dissemination action plan (Coombs, 2015) for crisis situations in the OECS.

**References**


Cooperative Unions: Catalysts for Change in Least Developed Countries

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Introduction/Theoretical Framework/Review of Literature
While significant investments have been made by international donors and research institutions to increase agricultural productivity and enhance market systems for smallholder farmers in the world’s poorest nations, only a small portion of the potential impact has been realized from this work. The development barriers for smallholder farmers fall beyond the scope of technology advancement or infrastructure improvement since they are deeply embedded within the capacities, attitudes, and behaviors of farmers and their ability to engage with the broader agricultural value chain system. Due to weak public-sector support, we propose that the source of sustained and scaled transformation in agriculture sectors of the least developed countries occurs through organizations such as cooperative unions and similar agriculture enterprises that link the demand, technologies, and policies extended by the larger agriculture system to the inputs, skills, and spirit offered by the smallholder farmer and their local communities.

Purpose and Objectives
Our presentation shares our six-year experience developing an agriculture system in South Sudan under a $60 million program, called the Food, Agribusiness, and Rural Markets (FARM) project, funded by the United States Agency for International Development and the Feed the Future Initiative. We began our work by helping smallholder farmers, who were victims of prolonged civil war, become food secure through increasing productivity and promoting surplus production. Our program greatly enhanced farmer productivity by as much as 500% through the introduction of basic technology and management practices, but our challenge was to create markets for surplus production in one of the world’s most underdeveloped and fragile environments. While we directly established a network of 472 community groups with a cohort of 20,000 farmers across three states, we realized that sustained advancement of the sector falls on the strength and influence of intermediary organizations such as cooperative unions to connect smallholder farmers and communities with the greater agricultural system. Therefore, the objective of our presentation will be to identify the access barriers preventing smallholder farmers from succeeding in modern agriculture systems in the least developed countries, explain the role intermediary organizations play in connecting smallholders to these systems, and describe how development programs can help cooperatives unions and other agriculture groups to meet their greater purpose.

Methods, and/or Data Sources; or Theoretical/Philosophical Themes
Our program worked in the Greenbelt region of South Sudan from 2010 through 2016. During this time we collected a considerable amount of data which included a crop yield assessment conducted by a leading US university, a survey of 598 individual farmers and 74 community-based farmer organizations collected by a third-party data collection company, organizational assessments of seven cooperative unions conducted by an independent consultant, and policy
dialogue discussions with state and local leaders that were held at several field locations during the final year of the project.

**Results, Products, and/or Conclusions**
The cooperative unions are influential in our development model to advance and link smallholder farmers to the greater agriculture system. These intermediary organizations identify value-addition opportunities and markets for their members and provide access to appropriate inputs, technologies, extension services, skill trainings, quality controls, logistic services, and business linkages to help each member produce in a profitable manner. However, cooperative unions can also be primary catalysts for societal change for smallholder farmers and agricultural communities. They can introduce innovation and behavior change to smallholders resulting in more effective farming and provide opportunities to develop their soft skills to become entrepreneurs and leaders in their communities. Cooperatives can give members a voice in local affairs and a collective voice to higher government and policy levels. They have the power to transform the roles of women and youth by giving them access to life beyond their families and to learn and grow as individuals and potential leaders. Cooperatives provide the opportunity for local citizens to work together for individual benefit and common good and to build civic trust, cooperation, self-governance, and resiliency within their communities. These organizations also provide possibilities for inter-community cooperation and interdependence through trade and collaboration establishing a foundation for peaceful and stable societies.

**Recommendations, Educational Importance, Implication, and/or Applications**
This presentation will emphasize the potential of cooperative unions and similar agriculture enterprises to serve as significant change catalysts for many developing countries, particularly those in conflict or post-conflict recovery. The challenge for development and research organizations is learn how to support and strengthen these organizations to optimize their potential with the overall goal of taking over our implementation work in the field.
Developing Critical Thinking and Social Capital in International Agricultural Education: A Case Study in Preparing the Next Generation

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Introduction and Theoretical Framework
Critical thinking is stressed to be implemented in the classroom more than ever in today’s education (Ku, 2009). However, little consensus is found regarding how to best measure critical thinking competencies, or even what the definition of critical thinking is (Ennis, 1993). Students participating in youth leadership organizations like the U.S. National FFA Organization have the potential to develop critical thinking skills more proficiently than others (Rickets & Rudd, 2005). Social capital is an economic concept that presumes people and the resources they interact with have intrinsic economic value (Rasmussen, Armstrong, & Chazdon, 2011). National FFA’s Washington Leadership Conference (WLC) affords students the opportunity to develop critical thinking in a unique way that progresses international agricultural education and extension, and social capital (National FFA Organization, n.d.).

Kolb’s (2015) model serves as the theoretical foundation of WLC. The conference is specifically segregated into developing four main components of citizenship: students knowing their purpose as leaders, valuing diversity, being an engaged advocate, and serving their community, whether local or global. Every workshop and breakout session provides students with a concrete experience. Participants then have the opportunity to experience reflective observation as they answer processing questions about leadership concepts in front of large and small groups, and also through recording notes and answers in workbooks. Students reflect as they undergo abstract conceptualization in the form of opportunities for application, primarily through forming a “Living to Serve” service project plan to be conducted back in their respective communities. WLC capstones in active experimentation when students participate in a meal packaging event that will be donated to local D.C. area food pantries.

Purpose
The purpose of this case study was to examine components of WLC that were successful and the likelihood successful attributes could be replicated in other youth international agricultural education programs.

Methods
Case studies are multi-perspectival analysis (Tellis, 1997) that thoroughly examine a wide range of issues, events, and incidents that are utilized as an opportunity to educate (Yin, 2009). A case study affords the reader the opportunity to vicariously expand their tacit knowledge about issues that occur outside nontraditional research contexts and settings (Lincoln & Guba, 1985). Case studies have been utilized in international agricultural and extension contexts (Agunga & Igodan, 2008; Black, Moore, Wingenbach, & Rutherford, 2013; Kock, Haynes, & Smith, 2015) to better understand successful and unsuccessful programs.
Results

WLC students consistently show positive growth in their leadership development and their understanding of the programmatic objectives, including problem solving, relationship building, and involved citizenship. The capstone food packaging experience resulted in 424,457 meals donated to Washington D.C. food pantries in the summer of 2017 alone. Students are incentivized to carry out their “Living to Serve” plans by applying for $500 scholarships awarded to select student project proposals. Additionally, agriculture education teachers that attend the Advisors WLC Program are shown to have a positive influence on an FFA program’s quality (Vaughn & Moore, 2000).

While the students of WLC are diverse in background, an overwhelming 76.3% of the students identified as living in a rural (10,000 people or less) hometown (Brick, 1998). Of these rural students, 65% of these students hail from the Central and Midwest region of the United States, the dominate agriculture sector of the United States (Brick, 1998).

Recommendations and Educational Importance

Human and social capital are vitally important to the development of a community (Rasmussen et al., 2011). Conferences that develop youth leadership competencies and social capital should be replicated in other countries as an approach to develop the future agricultural sector. Ministries of Agriculture, institutions, agriculture educators, and individuals engaged in youth leadership would benefit from conferences that seek to increase youth’s exposure to agricultural issues. Providing the next generation of agricultural leaders with experiences, observations, conceptualizations, and opportunities for experimentation (Kolb, 2015) will not only improve individuals but increase the probability that agriculture will be supported in the future.

Future research is needed to understand the extent international agricultural leadership programs can partner with agricultural companies to support conferences and provide potential job opportunities for program graduates. Research is needed to investigate program participants’ growth in critical thinking skills and social capital development. The data may help program coordinators secure and allocate resources towards similar high-impact experiences in order to develop future agricultural education and extension leaders in their respective communities.

References


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Introduction & Theoretical framework:
“Framing refers to the process by which people develop a particular conceptualization of an issue or reorient their thinking about an issue” (Chong & Druckman, 2007, pp 104). The idea of framing involves selection of some aspects of a perceived reality making it more salient, hence promoting a particular view, opinion, behavior, or usage of a specific concept or item (Entman, 1993). Frames in agricultural communication (AGCOM) influence how communication is used as well as the role that it plays in agriculture, affecting how communication activities are planned and implemented (Borah, 2011). These frames have, among others, promoted the use of AGCOM as a reactive and defense tool (Kurtzo, Hansen, Rucker, & Edgar, 2016) as well as a tool for disseminating improved technologies to farmers for improved adoption (Aker, 2011; Manda & Chapota, 2015).

AGCOM is framed differently in different regions and countries depending on the focus and challenges that it seeks to address. However, not much has been done in trying to understand how these frames impact agricultural development.

Purpose and objectives:
This study is aimed at exploring the focus of AGCOM and its implications for sustainable agricultural development. The following are specific objectives of the study:
・ To describe the target audience for AGCOM in U.S., Kenya, and Malawi
・ To describe differences in implementation of AGCOM interventions in these three countries

Methodology:
This exploratory study used qualitative research methods. A content analysis of AGCOM artifacts developed in these three countries from 2010 through 2016 was conducted. These artifacts included peer reviewed articles, video documentaries, clips of radio programs, and print publications such as leaflets and magazines. Purposive sampling was used to select the Journal of Applied Communications as it serves as an outlet for disseminating peer-reviewed scholarly research in agricultural communication (Lacy, Watson, Riffe, & Lovejoy, 2015; Naile & Ray, n.d.). However, the peer review of articles mainly focused on the U.S. context due to limited availability of publications in the journal from Kenya and Malawi. Therefore, for Malawi and Kenya, the results discussed in this paper are mainly based on content analysis of the actual communication materials such as video documentaries, clips of radio programs, and print publications such as leaflets and magazines.
Results:

Objective 1. Describe Agricultural communications’ target audience
Consumers and the public who have little or no knowledge about the agricultural industry or profession are the major target audience for AGCOM in the U.S. These audiences were described to be at a risk of being misinformed or developing negative perceptions about agriculture as they rely on mainstream media for information on issues such as food safety (Sellnow & Sellnow, 2014). For Kenya and Malawi, the major target audience was farmers who were facing low productivity on their farms due to limited access to technical information (Aker, 2011).

Objective 2: Differences in implementation of agricultural communications interventions
AGCOM in the U.S. is used as a tool for creating positive perceptions in response to negative perceptions being created by the mainstream media and educating the consumers about food safety and other issues (Watson, 2010). In contrast in Kenya and Malawi, Agriculturist and AGCOM experts use the mainstream media as an outlet for reaching out to farmers with agricultural information. As such the Ministries of Agriculture and other agricultural organizations are responsible for production and sponsorship of most of the content disseminated through mainstream media.

Implications:
AGCOM seems to have a different focus in developing and developed countries. However, in both contexts, there seems to be increased emphasis on dissemination of information to the audience with little focus on audience engagement. For developing countries, such an approach seems to be problematic considering that most extension agents have limited facilitation skills, thereby denying farmers an opportunity to demand agricultural extension services (Masangano, Kambewa, Bosscher & Fatch, 2017). Using AGCOM to engage the audience can help in capturing unheard voices (Boron, 2013). Thereby promoting empowerment, dialogue, coordination, and participation (Fraser & Villet 1994; Cardiz, 2005) which is crucial for achieving sustainable agricultural development.

Additionally, no matter the country, AGCOM needs to be active as opposed to reactive if it is to make a positive impact. Taking an active approach through communication will enable AGCOM professionals to take advantage of the mainstream media to capture and strengthen the voices of unheard audiences, like has been the case in recent medical industry campaigns (Bunning, Heath, & Minnion, 2009).

References


Enhancing Global Perspectives Through International Agricultural Education Experiences

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Introduction
US students studying abroad have increased 52% in the last decade (IIE, 2016). As a result, the documentation of positive influence of international educational experiences are well-established in the literature (Kitsantas, 2004; Martin, Moore, Wingenbach, Jones, Redwine, & Rutherford, 2016; Redwine, Rutherford, & Wingenbach, 2015; Williams, 2005; Zhai & Scheer, 2002). Extensive efforts to measure successes and participation in international agricultural and extension education experiences have led to many instruments, questionnaires, and strategies (Aboagye, 2011; Carlson, Bum, Useem, & Yachimowicz, 1991; Engle & Engle, 2003; Kelley & Meyers, 1995; Lee, 2011). Ultimately, practitioners must operationalize desired outcomes and implement consistent measures in multiple settings to determine truly successful outcomes of international educational experiences.

USDA-NIFA articulates three priorities to enhance the education pipeline continuum; the second priority is to broaden learning opportunities to create a workforce equipped with 21st century skills, namely soft skills (i.e., teamwork, problem solving, decision-making, etc.) and career competencies (i.e., professionalism, self-management, etc.) (USDA, n.d.). To meet this call and a need for consistent measurement of international experiences, we measured agriculture students’ global skills from three international experiences.

Purpose and objectives
The purpose was to measure impacts of international educational experiences in agricultural disciplines. Three objectives guided the study: 1) Describe participants’ pre-experience global skills as measured by the Global Skills Inventory (GSI; Rosenbusch & Earnest, 2015), 2) Describe participants’ post-experience global soft skills, and 3) Determine if significant differences existed in global skills after international experiences.

Methods
We used a pre/post questionnaire design and purposively sampled participants (N=52) in three international experience programs at State University. Programs included Namibia 2016 (n=15), Costa Rica 2017 (n=17), and Namibia 2017 (n=21). These programs were selected because they included common instructors, course materials, and assignments, which were specifically designed to enhance global soft skills.

We used the GSI to measure soft skills. The GSI is a 60-item questionnaire, delivered online, which measures soft skills in five domains: global perspectives, communication, resource management, problem-solving, and psychological health. Pre- and post-experience GSI scores were compared across the five domains.
**Findings**

Significant differences (p < .05) existed between pre- (M = 66.93, SD = 11.72) and post-test (M = 73.30, SD = 8.42) scores in the global perspectives domain. Participants realized significant positive gains in cultural knowledge and synergistic learning, manifested by respect for other cultures, peoples, and viewpoints while engaging with host country nationals, regardless of international experience location. No significant differences existed between pre- and post-test scores in the other four global soft skill domains (i.e., communication, resource management, problem-solving, and psychological health).

**Conclusions and Implications**

Each international experience program was designed to enhance participants’ global perspectives. Significant differences in the global perspectives domain were found; therefore, we conclude our international agricultural educational experiences significantly and practically enhanced global perspectives. Our programs contribute to USDA’s articulated call for graduates equipped with soft skills for a 21st century agricultural workforce, and support previous findings that such experiences positively impact students (Kitsantas, 2004; Martin, Moore, Wingenbach, Jones, Redwine, & Rutherford, 2016; Redwine, Rutherford, & Wingenbach, 2015; Williams, 2005; Zhai & Scheer, 2002). If global perspectives are enhanced through international agricultural educational experiences, then education and extension professionals should continue developing such experiences.

Although no significant differences were found in the other domains, we cannot conclude that no enhancement existed. Mean scores in both pre- and post-tests were high for all groups. When pre-test scores are already high, there is minimal room for gains in the measurement. Therefore, we recommend improving the construction and measurements of the domains in the GSI to increase likelihood of accurate measurement. These efforts build on the tradition of previous scholars who sought to define measurement of soft skill development in their research (Aboagye, 2011; Carlson, Bum, Useem, & Yachimowicz, 1991; Engle & Engle, 2003; Kelley & Meyers, 1995; Lee, 2011).

**References**


Enhancing Learning in Haiti by Determining if Problem Solving Style Influences Faculty Teaching Philosophies

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Introduction
Haiti is a highly impoverished country and suffers from chronic food insecurity (USAID, 2011). Increasing food production has been identified as a solution to rural livelihoods and national food security (USAID, 2011). This goal will require improved human capacity across the value chain so technicians, extensionists and scientists have the requisite skills to address Haiti’s complex problems (USAID, 2011). The most skilled of Haiti’s agricultural workforce are graduates of the country’s universities, so it is reasoned these individuals should be able to solve complex problems. This implies problem solving is included in the curricula and taught by faculty. As a precursor to curricula reform, it is necessary to know the problem solving capabilities of faculty. This study begins to answer this question.

Purpose and Objectives
This study’s purpose was to explore if problem solving style influences a faculty member’s teaching philosophy to drive the creation of professional development opportunities that fit within their problem solving paradigm further encouraging learning and engagement. The objectives of the study were to (a) identify the problem solving styles of Haitian faculty members and (b) explore the influence of problem solving style on the faculty members’ teaching philosophy.

Methods
As part of the Haitian faculty development workshop, the in-country training coordinator collected data face-to-face. Data were collected using the Kirton Adaptation-Innovation Inventory (KAI) (Kirton, 1976) and an open-ended teaching philosophy questionnaire. Data were then analyzed using descriptive statistics and qualitative content analysis (Merriam & Tisdell, 2015). The KAI was used to determine the participants’ problem solving style. KAI styles include Adaptors and Innovators, with those in the middle of the spectrum as Bridgers. Adaptors are sound individuals who are systems minded and follow strict norms for problem solving. Innovators work outside of systems and provide numerous ideas for problems by ignoring limitations.

Results and Conclusion
The study identified key words in the teaching philosophies that related to the Kirton’s style and then compared them to participants’ scores. The qualitative analyses of teaching philosophies were sorted into KAI type based upon their language. For example, Adaptors used language such as “transmitting knowledge,” “managing,” and “guiding learners.” These words suggest a strong structural system. Being systems minded is a quality of an Adaptor. Innovators would use phrases such as “discovering” and “exploring” and would desire “interactive experiences” for
students. These words indicated a non-systematic view to learning, which is an innovative tendency based on literature. The analysis of teaching philosophies also identified Bridgers who used verbiage that was similar to both styles. The quantitative analysis was then used to determine where the participants fall on the spectrum numerically. These results show there were one Innovator, five Bridgers and three Adaptors. For the Bridgers, many were closer to the adaptive side of the spectrum. The study found the majority of respondents had matching qualitative and quantitative results, indicating participants were identified correctly and were using language that aligned with their problem solving style. Therefore it can be concluded problem solving style influences teaching philosophies of Haitian faculty.

Furthermore, knowing problem solving styles is critical for classroom structure and developing well-rounded learners. Students, as Innovators or Adaptors, require a host of teaching styles for a quality education. Frustration can grow between faculty and students of opposing styles because the classroom structure will be uncomfortable for those who differ from their instructor cognitively. This study found a scarce amount of innovators among the Haitian faculty members. This is problematic because lacking innovative styles will limit many students because of their problem-solving style. Expanding the sampling size of Haitian faculty members will create a more definitive picture of the problem solving styles present.

**Recommendations**

Since food insecurity is a prevalent issue in Haiti, advanced problem solving skills are needed. Based on these results the study recommends:

- Provide trainings that will build adaptive and innovative skills and teaching strategies for Haitian faculty.
- Provide trainings for faculty to identify adaptive and innovative behavior in their students in order to better tailor to the learners’ educational needs.
- Prepare future Haitian faculty members to understand their academic appointments and how their problem solving style may or may not align with the system.
- Conduct research on the agriculturalists in Haiti and determine their problem solving styles. Conduct research that compares the problem solving styles of faculty at public and private institutions to determine if differences exist.

**References**


Entrepreneur Fellows’ Views after Participating in a Fellowship Program to Empower Economic Success: New Media’s Role in their Ventures

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Introduction/Theoretical Framework

“There is a need for a profound shift in our involvement with people in developing countries from distant aid recipients to partners in building a global future” (Federoff, 2009, p. 9). Information and communication technologies (ICTs), e.g., mobile phones, online databases, and new media networks, can be useful in shifting systems in developing countries to harness prevailing knowledge and using them for economic advantage (Juma, 2011). A vision for possible global collaborations, including use of ICTs, was conceived by Oklahoma State University’s agricultural education and communications faculty and funded in 2013 by the U.S. Department of State (Oklahoma State University Grant Proposal, 2013).

The 22 Entrepreneur Fellows (EFs) from Kenya, South Africa, and Uganda comprised the study’s quintain (Stake, 2006), including agricultural producers, entrepreneurs, educators, organizational leaders, and food and textile purveyors. The fellowship provided training on U.S. entrepreneurship, use of ICTs in entrepreneurial endeavors, and international trade; field experiences tailored to match EFs’ entrepreneurial goals; and U.S. cultural opportunities.

The theory of planned behavior (TPB) [Ajzen, 1991] undergirded the fellowship program’s goals. Modification of the Fellow’s entrepreneurial behaviors, as connected to their fellowship involvement, was reliant on the intentions held prior to their U.S. experiences during the program. The EFs’ behavioral intentions would affect their perceptions of fellow-related benefits (Ajzen, 1991). In addition, the EFs’ attitudes were hypothesized to be influenced by the knowledge and skills they anticipated learning during the fellowship, i.e., future perceived behavior control (Ajzen, 1991) and motivations likely to influence future success (Kuckertz & Wagner, 2009).

Purpose/Objectives

This study sought to describe the EFs’ perceptions of the fellowship’s impacts, including their use of new media in entrepreneurial endeavors, after returning home.

Methods/Data Sources

Decisive steps were taken to ensure the quality of this qualitative multicase investigation based on the protocols defined by Saldaña (2013), Stake (2006), and Tracy (2010). Onsite interviews with 15 South African and Ugandan EFs were held in May of 2015 followed by sessions with six
Kenyans and one South African Fellow using Skype during the summer of 2015. All interviews were transcribed verbatim and member checked by the EFs to ensure accuracy and credibility of the interview text (Creswell, 2007). Word-for-word analysis was conducted using conventional methods resulting in categories elicited from the study’s textual data (Hsieh & Shannon, 2005). NVivo’s qualitative analysis software was used to confirm keywords, context, and content (Hsieh & Shannon, 2005) revealing the predominant themes of the study (Creswell, 2007).

Results/Conclusions

What were the EFs’ experiences with new media in regard to a) continuing communication with other entrepreneurs, including U.S. mentors, and b) their entrepreneurial enterprises in general, after returning to their home countries? This question was one of six that comprised the larger study. Results for this research question included the integral nature of new media tools to the EFs’ marketing activities and examples of their use of new media sites to converse with mentors, program staff, and global fellowship members. For example, an EF expressed: “People are mostly engaged on WhatsApp. So when you put up an advertisement, they tell everybody to look or read that advertisement” (P03 Interview: 288-289). Another stated: “I learned to collaborate and connect with people not only by social media platform but also socially” (P14 Interview: 6-13).

New media platforms used most frequently in the EFs’ enterprises after the fellowship were Facebook, Skype, and WhatsApp. They described using new media tools in promoting their products and services, monitoring industry trends, posting training events, and soliciting investors, among others. In addition, EFs stated collaborations were sustained with global entrepreneurs and U.S. mentors through use of new media technologies after returning to their countries.

Electronic mail, Facebook, and WhatsApp were communication conduits for forming a new multinational, youth organization by select EFs called Partnership for African Youth in Agriculture (PAYA); and now known as GLO (for global)-PAYA (Bragoli, 2016). GLO-PAYA supports opportunities for youth to make a difference in their local communities and explore agricultural career options.

Recommendations/Educational Importance

Examining features of EFs’ online postings and expanded use of ICTs could provide the basis for additional online training for EFs or inclusion in similar fellowships. Broader participation on one primary new media site could address the EFs’ requests for facilitation of ongoing interactions with U.S. colleagues over time well after their fellowship program has ended. In addition, use of this site could advance planning and execution of GLO-PAYA programs for youth across Africa.

References


Environmental Perception of University Students: A Comparison Between the [USA University] [College] with the [Latin American University]

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Introduction
The problems the environment is currently facing are increasing rapidly (United Nations Environment Program [UNEP], 2016). People’s lifestyles and sense of environmental responsibility are key factors in addressing environmental problems (Atav, Altunoğlu, & Sönmez, 2015; Gifford, & Nilsson, 2014). While there exist many programs focused on changing people’s behavior regarding the environment (Gifford, & Nilsson, 2014), new alternatives, such as the Sustainable Development Goals (SDG), have emerged to encourage environmentally responsible behavior through sustainability education (SDG, 2016). Young citizens play an important role in shaping and transforming society; they currently have greater access to information allowing them to take a determined stance on issues such as the environment (Jaén & Barbudo, 2010). Although, a study presented by Qi and Zhang (2011) stated there is a positive relationship between environmental attitudes and behavior, another study demonstrated that young people’s environmental perceptions are not always related to their behaviors (Grønhøj, & Thøgersen, 2012).

Understanding the environmental perceptions of people involved in agriculture, such as students of agriculture and natural resources, is a necessary first step in order to design meaningful interventions to enhance their environmental awareness (Sabiha, Salim, Rahman, & Rola-Rubzen, 2016). Additionally, it is important to assess if the context in which students live has an influence on their environmental perceptions and behavior (United Nations, 2015). However, there are limited studies on what students of agriculture think and how they behave concerning the environment.

The Theory of Planned Behavior proposed by Ajzen (1991) was the framework used for this study. This theory establishes how people's behavior can be changed. Understanding the perceptions and attitudes young people have regarding environmental issues is essential to promote initiatives to improve their environmental awareness (Grønhøj & Thøgersen, 2012), and their environmental practices.

Purpose and Objectives
This study aims to understand and compare students' environmental behavior and perceptions at [USA University] [College] and [Latin American University]. It is intended to identify the attitudes and behaviors that students have towards the environment. Three specific objectives shaped the study:
1) To compare the attitudes and behaviors in both universities.
2) To evaluate students' perceptions regarding environmental education at their university.
3) To propose alternatives to enhance students’ perceptions and behavior toward the environment.
Methodology
For this quantitative study, the population (N = 899) was composed of undergraduates from the [USA University] [College] (n = 456) and the [Latin American University] (n = 443) majoring in agriculture and natural resources. Students completed an instrument developed by the researchers regarding their environmental perceptions and behaviors. Prior to data collection, the instrument was analyzed for reliability and validity. Data were analyzed using SPSS v. 22 and the following statistical analyses were conducted: descriptive statistics and T-test.

Results
Objective one showed a significant difference on students’ perceptions (p = .02), however, there was no statistically significant difference on behavior (p = 0.23). [Latin American University] presented a higher environmental perception than [USA University] [College].

Objective two aimed to evaluate students' perceptions regarding the environmental education at their universities. Students at [USA University] [College] presented a higher perception of the effort the university is making to educate students on the environment than [Latin American University] (p < 0.01).

Objective three assessed the strategies students consider as important for improving their environmental perceptions and behavior. The most important strategy for the USA students sampled was receiving financial incentives. The most important strategy for the Latin American students was to see friends and activists taking positive environmental actions.

Conclusions and Recommendations
This study indicates that although there are differences regarding attitudes, there is still room to grow since none of the institutions presented high levels of environmental attitudes and behaviors. The students from the [USA University] [College] demonstrated a more positive perception of the efforts made by their university, but results also show room for improvement. Researchers also explored strategies to improve students’ environmental behavior, demonstrating the importance of economic incentives for the [USA University] [College] students and the importance of peers and activists for the than [Latin American University] students. Results can be used to improve environmental perceptions and behaviors of students. Understanding the most effective strategies for changing students’ environmental attitudes and behavior, depending on their context, can help in the design of more appropriate interventions with students.

References


Evaluating Food Security in a Honduran Livestock Project

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Introduction
Approximately, one million people are undernourished in Honduras (FAO et al., 2015). Factors such as poverty, insufficient food productivity, high unemployment rates, and unequal access to land, income, health, and education, have been deemed as determinants of the current food insecurity status in the country (Honduras government, 2009).

The agricultural industry in Honduras contributes to 14% of the Gross Domestic Product (GDP) and employs approximately 33% of the population (United Nations [UN], 2016). More importantly, livestock production is the third most important agricultural industry (Banco Central de Honduras [BCH], 2016). Sansoucy (1995) suggested the livestock industry in developing countries is an important driver for the economy as it plays an important role to ensure food security (Reiber, Peters, Hoffmann, & Schultz-Kraft, 2012).

Evaluations can potentially inform needed social actions and contribute to policy making with the purpose of solving larger problems afflicting communities and regions (Rossi, Lipsey, & Freeman, 2003). This study is based on the program theory and is supported by the conceptual framework of sustainable livelihoods (Bickman, 1987; Scoones, 1998)

Purpose and Objectives
The purpose of this study is to evaluate the food security impact of reopening a public meat processing plant in Honduras. The following research objectives guides this study:

1. Evaluate participants’ experience of food insecurity.
2. Evaluate the influence of participants’ demographic and socio-economic characteristics their experience of food insecurity.

Methodology
A non-experimental, prediction studies design was used. Prediction designs fall within descriptive research (Ary, Jacobs, & Sorensen, 2010). The population of this study were participants of the project through the public meat processing plant (N = 156). Participants completed a survey instrument longitudinally throughout the project. Five data collection points were taken over the course of one year. The instrument included: a demographic and socio-economic data of the participants, the 24-hour recall of the household dietary diversity score (HDDS), and the food insecurity experience instrument developed for Latin America (Escala Latinoamericana y Caribeña de Seguridad Alimentaria [ELCSA]). Diet diversity and experience of hunger scales have been widely used by the international community. They are part of the set
of indicators most commonly used in agricultural projects and should be used to assess program impacts (Herfort & Ballard, 2016).

Descriptive statistics and a logistic regression model were used to analyze data. Data was analyze using SAS®. A significance level of .05 was set a priori.

**Results**
Most of the participants were males (86%), with an educational level of primary school (33%), their household average size is 6 individual, 3 adults and 2 children under 21 years old. Approximately 91% of the population reported their households are experiencing food insecurity. The majority fell within a mild experience classification (45%), followed by moderate (31%) and severe experience (12%). At the beginning of the project, 98% of households with children under 18 years old reported food insecurity and most of them at a severity level considered as mild (49%). Throughout the data collection points, the participants reported their experience of food insecurity and diet diversity remained similar.

Preliminary analyses indicate variables such as employment status (employed versus non-employed), individuals’ income, and other household members’ monetary contributions, contribute to households’ food security.

**Recommendations - Implications**
Overall, households without children presented a tendency of being food secure when compared to households with children. It is important to highlight that 12% of participants reported a severe food insecurity experience, meaning some households’ members have not eaten anything during an entire day, including children. Even though an increased income was observed in households, proxy indicators of food security such as the experience of food insecurity/security and the diet diversity scores remain similar. This suggests households are not necessarily investing additional income in improving their food consumption. It is important to evaluate whether food in this region is available and accessible to the population. A lack of physical or social access can limit households’ possibilities to acquire food despite having an increased income.

The international development community has suggested agricultural investments and projects should incorporate nutritional goals among the target population since malnutrition can have costly implications for nations (Herforth, Jones, & Pinstrip-Andersen, 2012). The lack of education has been deemed as a key factor for vulnerability to food insecurity (World Food Programme [WFP], 2016). Therefore, it is recommended to incorporate educational components to projects involving food insecure population to strengthen their knowledge regarding food choices, food preparation, and consumption of nutritious and safe food to lead healthy and active lives.

**References**


Expansion into the Universe of Big Data

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Introduction
In agriculture, digital technology has changed the way many agricultural producers in developed countries approach decision making. Farmers are using sensors in their fields and crops, which provide data on soil conditions, fertilizer requirements, water availability, and pests. Plants are monitored for nutrients and growth rates (Sparapani, 2017; Wolfert, Ge, Verdouw, & Bogaardt, 2017). Informed consumers are accessing big data when purchasing food to determine effects on human health using mobile devices and diverse food apps (Palbom, 2017).

The rapid growth of digital technology and data have guided the scientific community to develop a new concept known as big data, defined by its dimensions: velocity, variety, veracity, and volume (Gandomi & Haider, 2015). These data come from different sources: sensors used to track climate information, social media site content, digital videos and pictures, cell phone apps, purchase transaction records, the Internet of the things, and other sources (IBM, 2017). The availability of these and other big data sources in agriculture offer a unique opportunity for researchers and policymakers to collect and analyze different amounts of data that can be used to understand and respond to issues ranging from climate change to food security.

Purpose and Objectives
The purpose of this study is to document big data use in agriculture and its implications upon our discipline. The objectives of this study are to examine how we have been thrust into the world of big data by sophisticated tools and explore ways in which the use of big data will change and challenging our traditional norms of how we collect, reduce, analyze, integrate, visualize, store, and use data.

Methods
This theoretical paper will draw from the authors’ collective research experiences and the literature. We believe that if our discipline is to remain viable it will be necessary for us prepare our next generation of scholars to embrace the world of big data. The future of agricultural research depends upon in part the use of data sets from other scientific disciplines, social media, non-government sources, and large public government datasets (e.g. weather, GPS, and census) (Ramaswamy, 2015).

Results and Conclusion
The Consultative Group on International Agricultural Research (CGIAR) launched a platform for big data in agriculture with the support of its 15 research centers and other 47 external partners including the Food and Agriculture Organization of the United Nations. The platform focuses on making available and sharing agricultural data to help farmers and policymakers make reliable and informed decisions. Another initiative is the Agrimonitor Producer Support Estimate (PSE) Agricultural Policy Monitoring System that provides quantitative information on commodity prices, direct payments to producers and general services. In the behavioral sciences,
data sharing can be accomplished through shared institutional platforms such as the University of Michigan’s Inter-University Consortium for Political and Social Research which promotes research in the field of data science and facilitates social science data sharing around the world. Sophisticated data collection tools being used in A&EE are also forcing our researchers into the big data arena. For example, ADVISEE (2017) utilized eye-tracking technology to determine consumers’ motivational saliency on total fixation duration on genetic modification of plant foods and antibiotic use in livestock. At this same conference in 2017, AUTHOR, et al., provided an overview of a suite of psychophysiology tools that have been used to measure cognitive resource allocation (heart rate), emotional response or arousal (skin conductance), and valence of emotional response (facial electromyography) of beginning farmers and ranchers in the U.S. These tools literally generate over 1,000 units of data per second, requiring researchers to go through a data reduction process prior to statistical analysis. Our discipline will undergo rapid changes in the future in the production of disciplinary scholarship, in part due to access of sophisticated tools and equipment which will generate copious amounts of data.

**Recommendations**

It is imperative that both current and future academicians and researchers expand our knowledge base in the use of big data and how combinations of types of big data (e.g. spatial-temporal, quantitative and qualitative) will contribute to our discipline’s knowledge and transdisciplinary science. Thus, now is the time for crucial dialogue in how best to leverage academic experiences (e.g. graduate course work, post-doctoral fellowships, and/or sabbaticals/professional development leaves of absence) and which knowledge components are most essential (e.g. python programming language, more dynamic data analysis tools such as R software, data visualization tools such as Tableau, and/or data sharing through data journals and/or repositories).

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ADVISEE, 2017.

AUTHOR, 2017.


Exploring Analytical Approaches for Understanding Students’ Motivations to Study Abroad

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Introduction
Study abroad programs are popular options for providing students with experiences that facilitate notions of intercultural understanding, global competence, and opportunities to explore complex issues of identity, power, privilege, and culture (Doerr, 2013). This phenomenon includes students studying in the agricultural and related sciences and preparing for careers likely to involve intercultural and international interactions. However, conceptualizing intercultural and global competency is complicated (Deardorff, 2011; Doerr, 2013), and not all students have the means or desire to study abroad.

Previous research into relative cost found strong associations between lower-order cost constructs and agricultural students’ motivations to study abroad prior to being graduated (Raczkoski, Robinson, Edwards, & Baker, in press). Therefore, to better understand students’ conceptualizations of relative cost, we assert the need exists to develop and validate a motivation instrument based on the Expectancy-Value-Cost (EVC) model. Validity evidence is presented for a scale that could be used to understand perceived costs of agricultural students for enrolling in short-term, study abroad courses.

Theoretical Framework
The Expectancy-Value-Cost (EVC) model framed this study. The model has emerged as a sound theoretical framework focused on the relative cost component proposed in Expectancy-Value-Theory [EVT] (Barron & Hulleman, 2015). Cost is theoretically distinct and should be differentiated from other components within the EVT model, such as expectancies for success and subjective task-values (Flake, Barron, Hulleman, McCoach, & Welsh, 2015). The four subdomains of cost include outside effort cost, task effort cost, loss of valued alternatives cost, and emotional cost.

Purpose/Objectives
This study’s purpose was to validate an instrument using agricultural students’ conceptualizations of relative cost in the context of short-term, study abroad programs. Four objectives guided the inquiry.

1. Examine the fit of a four-factor EVC model;
2. Estimate lower-order factor reliabilities and evaluate their adequacy, i.e., $\alpha > .70$;
3. Calculate correlations between four latent EVC subfactors, relative cost, and overall motivation to study abroad; and
4. Determine the association between relative cost and overall motivation to study abroad.

Methods
For this study, 16 items were presented in random order, online using Qualtrics Survey Software, with a 5-point summated scale: 1 = Completely disagree, 3 = Neither agree nor disagree, and 5 = Completely agree. The investigation began with an exploratory factor analysis (EFA) for the items using principal axis factoring (PAF). Promax rotation enabled researchers to gain a clearer understanding of the underlying factor structure (Costello & Osborne, 2005). We established internal reliability using post hoc Cronbach’s alpha coefficients, and Pearson’s correlations to estimate relationships between variables based on Davis’ (1971) conventions. Logistic regression determined the association between overall motivation to study abroad and subdomains of relative cost.

Results
Four factors were extracted, explaining 74% of the variance: outside effort cost (51.7%), emotional and task effort cost (two items from emotional cost loaded on this factor; 11.4%), emotional cost (6.0%), and loss of valued alternatives cost (5.3%). Reliability coefficients computed using Cronbach’s alpha scores for each factor were outside effort cost = .89 (four items); emotional and task effort cost = .86 (five items); emotional cost = .85 (three items); and loss of valued alternatives cost = .86 (four items). A logistic regression analysis predicted motivation to study abroad for agriculture students. Prediction success overall was 73.5%, i.e., 56.8% for unmotivated and 83.3% for motivated. Exp (B) values indicated that when outside effort cost is raised by one unit (agreeableness) the odds ratio was 2.34 times as large and, therefore, students were 2.34 times more likely to be motivated to study abroad.

Conclusions
First, four factors explained 74% of the variance in agricultural students’ motivations to study abroad. Second, reliability of the scale was established (α > .70). Third, subconstructs of cost were moderately and substantially correlated to students’ overall motivation to study abroad. Finally, outside effort cost was useful for predicting the probability of whether a student is sufficiently motivated to study abroad.

Recommendations/Implications/Educational Importance
Students’ results on this scale could be used by course instructors and coordinators/directors of international programs as a tool when planning, promoting, and recruiting students for short-term, study abroad learning experiences. The tool would help create courses or programs and shape advising efforts in two ways: 1) develop targeted interventions to help agricultural students overcome perceived cost barriers so more study abroad; and 2) identify students who want to study abroad early in their college careers, e.g., during freshmen orientation, so they can connect with faculty and begin preparing for such experiences.

References


Exploring the Hen House: A Focus on Village Chicken Production in Kenya

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Introduction

In Kenya, around 75% of rural families keep a small flock of scavenging chickens, representing 71% of Kenya’s overall egg and poultry meat production (Nyaga, 2007). Raised in a small-scale, scavenging system, chickens are a relatively easy to manage and inexpensive product that provide great benefits to even the most vulnerable populations (Copland & Alders, 2005; FAO, 2015; Guèye, 1998; Sonaiya, 2008). In Kenya, as well as other African nations, women’s role in village chicken (VC) production is especially emphasized, as studies have shown that women are often the “owners” of VC flocks (Guèye, 2005).

The potential for village chickens has not escaped the Kenyan government: The National Agriculture and Livestock Extension Programme (NALEP) highlights poultry production in its activities and objectives (Cuellar, Hedlund, Mbai, & Mwangi, 2006; Muyanga & Jayne, 2006). Several extension activities have been implemented, but VC producers continue to report challenges and adoption of technologies remains low (Kingori, Wachira, & Tuitoek, 2010; Nyaga, 2007). A 2012 study in Western Kenya found gender to have a predominant influence on low rates of adoption of a technology package for VC producers (Ochieng, Owuor, & Bebe, 2012). While male farmers more often adopted the full package, women more likely took a piece-meal approach, adopting only parts of it. Female producers were more risk averse and had less access to resources such as land, information, and credit. Other factors influencing adoption decisions were access to extension services, education level, membership of farmer groups, availability of off-farm income, and distance to market (Ochieng et al., 2012).

Unveiling these factors is crucial to strategizing strong programs and resources to support VC producer capacity, but further site-specific research is essential to establish best practices to overcome these obstacles.

Purposes and objectives

The objective of this research is to characterize VC production in Kitui and Embu Counties of Kenya, and to identify challenges and opportunities to the current systems. Researchers will also explore relationships between demographic factors such as gender, level of education, and distance to market and the knowledge and/or use of production technologies by VC producers.

Methods

A questionnaire was developed based on ILRI’s Gender, Livestock and Livelihood Indicators (Njuki et al., 2011) recent studies in Kenya (Mutombo, 2014). Researchers consulted with eight
veterinary extension agents (four from each county) and conducted pre-tests with local farmers to improve instrument clarity.

The questionnaire was comprised of closed, semi-closed, and open-ended questions that targeted activities involved with poultry management, participants’ knowledge of and access to resources, and perceived challenges. Researchers also collected demographic data.

Cluster random sampling was conducted to identify the sample population. Through random sampling of accessible villages, each enumerator was allocated four villages within their county. They conducted between six and eight questionnaires in each village, collecting 100 questionnaires per county.

**Results**

Preliminary data analysis conducted on the first 51 questionnaires thus far indicates that smallholders in both areas predominantly own and prefer indigenous chickens to cross-breeds and exotic breeds (commercial broilers of layers). Participants (n = 51) owned an average of 31 indigenous breed chickens (s = 25.5). Women are responsible for most activities related to poultry production, from feeding, to slaughtering, to deciding whether to sell or eat products. All participants had heard of Newcastle Disease and 88% reported that they have had an outbreak of Newcastle Disease in their flock. Seventy-six percent indicated that vaccination was the best control strategy for the disease, but less than 65% had vaccinated their flocks within the last 12 months.

In Kitui, extension services were more widely available than in Embu, though in both sites less than 65% of participants had used these services within the last 12 months. Only half of participants reported that financial services, such as credit, were available to them. Eighty-two percent of participants who said that credit was not available to them indicated that they would use it if they had access.

**Implications**

This exploratory research provides information on opportunities and challenges within VC production in Kitui and Embu Counties. This information is critical to developing successful programs to support VC producers in Kitui and Embu Counties, where persistent periods of drought makes crop-production especially difficult (Kenya National Bureau of Statistics, 2010). In continued partnership with the University of Nairobi and veterinary extension agents from each area, the next project activities will conduct research with stakeholders along the poultry value chain to assess how producers can gain better access to information and inputs that can help decrease production challenges and improve overall production.

**References**


Extension Agents’ Use of Learning Based Methods in Trinidad and Tobago

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Introduction and Theoretical Framework
Globally and regionally extension services have shifted from an advisory role providing knowledge and technology to a client oriented service which facilitates learning (World Bank, 2012; Allahyari, Chizari and Mirdamadi, 2009; Tropical Agriculture Platform, 2016). Extension agents’ new roles comprise adopting learning based initiatives for facilitating collaborative learning and knowledge management including participatory methods such as farmer-field schools and plant clinics (Faure, Desjeux, and Gasselin, 2012; Davis and Sulaiman, 2014). Extension specialists and developmental agencies consider learning based methods critical for meeting institutional and development goals (Rivera and Qamar, 2003).

The Ministry of Agriculture and Food Production of Trinidad and Tobago emphasizes learning based extension methods for improving service delivery. However, the success of the transformation of service delivery correlates with extension agent’s perception and use of the new methods of extension (Landini, 2015, Ramjattan, Ganpat, & Chowdhury, 2017). In Trinidad & Tobago, there is limited evidence about extension agent’s extant use of learning based methods of extension.

Purpose and Objectives
An analysis of extension agent’s extant use of learning based methods will provide important insights for the service provider institutions in the forecasting of learning based methods and requirements for attaining goals of service transformation. This study sought to:
• analyze extension agents’ use of learning based extension methods in Trinidad & Tobago;
• determine factors affecting use of learning based extension methods.

Methodology
One hundred and ten extension agents of the Trinidad and Tobago Public Extension, and Private Extension service providers were surveyed during March to May 2015 using self-reporting questionnaires. The survey instrument was a structured questionnaire with two sections; (a) nine demographic and job characteristics questions and; (b) ten variables as per the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003). Variables were measured using a four point Likert scale (‘strongly agree’, ‘agree’, ‘disagree’, ‘strongly disagree’) and data were analyzed using descriptive statistics and logistic regression. Four separate logistic models were run to identify the factors predisposing the use of learning methods, viz, (i) Discovery Based Learning (DBL) (ii) Agro-Ecosystem Analysis (AESA) (iii) Plant Clinics, (iv) Farmer Field School (FFS).
Findings and Conclusions

The majority of the extension agents (92%) worked in Ministry of Food Production and State-Assisted Agencies, followed by 8% in Private service providers. Most respondents (59%) were field agents- Agricultural Assistant I. While the supervisory group- Agricultural Officers (AO), Agricultural Assistant (II) and Agricultural Assistant (III) were 9%, 16% and 16% respectively.

Amongst the four methods investigated, DBL was least used (58%) followed by 62% using AESA method. There were high levels of use among the agents for the Plant Clinics and FFS methods, 89% and 85% respectively with no major difference observed between male and female extension agents. Markedly, all (100%) of the public extension agents used FFS, while the majority (84.9%) of private agents also utilized this method. AESA was less used by female extension agents compared to male agents.

The findings of the regression analysis indicated that social influence and networking had significant influence on extension agent’s use of AESA and DBL methods. This implies that agents were motivated by the positive influence of social pressures and collaborations of people who they viewed as important to them in encouraging the use of these methods. Agents realized that plant clinics could be organized in a short space of time providing prompt advice to more farmers. This increased efficiency and timeliness ultimately amplified the use of plant clinics.

Recommendations, Significance and Impact

The study suggests that networking and institutional support is necessary for the facilitating conditions which encourage adoption of learning based methods. Extension institutions may adopt innovative strategies for instance, strengthening of joint coordinated programmes which help mobilize resources for use of learning based methods. Since social influence was responsible for extension agent’s use of learning based methods extension institutions should organize ‘share fair’ or encourage extension agents to share experience using social and collaborative media. Creating these types of synergies among a wide range of actors at different levels could facilitate sharing of knowledge and competencies. The successful implementation of DBL and AESA methods required significant investments in developing human resources. It is evident that there is an issue of commitment for some extension agents, especially for female extension agents. Hence, strengthening female agents functional and technical skill, and reducing the programme activities to the critically needed aspects of farmer learning would be key considerations for improving use of these methods.

References


Facebook for Creating Online Networks of Innovation Actors: The Case of Agricultural Organizations in Trinidad & Tobago

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Introduction and Theoretical Framework
Agricultural organizations are increasingly using virtual and online media to interact with other stakeholders such as, producers and non-profits and to mobilize ideas, and resources (Cui, 2014; World Bank, 2017). There is a strong realization that interaction in virtual spaces can help organizations co-create knowledge and build networks of innovating people, institutions and systems and explore various business opportunities in rural area (Strong, Dooley, Irby & Snyder, 2014; Chowdhury & Hambly, 2013; EU SCAR, 2014). One-third of rural population in the world is now within the coverage of 3G network (FAO & ITU, 2016). The increased access to internet and Smartphone creates leverage for social media application in agricultural and rural development. In Trinidad & Tobago, Facebook users are estimated to be 486000 (CTA, 2014). However, there is anecdotal evidence about how agricultural organizations are using social media to enhance networks of innovation actors. How are the networks formed through social media that stimulate new ideas? Who are the influential actors in the social media networks? Using social network analysis (Hanneman & Riddle, 2005) and agricultural innovation system perspective (Tropical Agriculture Platform, 2016) this study is aimed at answering the above questions.

Objectives
The study intends to analyze and compare Facebook networks of different agricultural organizations (public sector, non-profit, private and producer organizations) in Trinidad & Tobago.

Methods and Data Sources
A list of 110 Facebook pages used by agricultural organizations was developed by searching in the search engine and search interface of Facebook. 29 pages were selected randomly from the list. Social network analysis evaluates interactions of an ego with the nodes/contacts and the positions of the ego in the social media network to support online conversations for knowledge sharing and learning. Interactional data for the recent 100 page posts (as of September 2017) were mined using NodeXL (Smith et al., 2010) – a cloud and desktop based social media data mining and SNA software. Network measures were used to analyze and compare the Facebook page networks of different agricultural organizations.

Results and Conclusion
The proportion of Facebook page is higher for private and non-profits sector (59%) followed by one-third (28%) page managed by producer organizations and only less than one-fifth page
(17%) run by public sector organizations. The page network of public sector organization had average higher number of nodes (269) and unique edge (206) compared to non-profits/community organization (nodes 222 and edge 185), private (nodes 232 and edge 199) and producer organizations (nodes 145 and edge 94). On other hand, the non-profits had dense network (.018) followed by producer organization (.013), public (0.007) and private (0.007) organizations. All organizations had an average higher number of in-degree than out-degree indicating organizations receiving ties from other nodes than creating ties with others in their networks. The average page rank value indicates that the page of public organization was the most important (100) compared to the page of non-profits (85.5), private sector (93.6) and producer organization (33.3). The public organization had higher brokerage roles in their page networks while comparing their average betweenness centrality scores (114181.33) with those of non-profits (71966.86), private (79803.09) and producer organizations (14078.57). On the basis of average closeness centrality, the network of private organization’s page had slowest speed of information (0.007) flow compared to the page of producer organizations (0.017), non-profits (0.016) and public organizations (0.013). It can be concluded that the public sector reached out diverse and largest number of actors and had highest brokerage roles in their network. Next to the public sector, both non-profits and private organizations had substantial reach of their page network. However, the page of non-profits and producer organization had dense network and rapid information flow.

**Implications and Recommendations**

As a unique study, the findings offer important insights for agricultural organizations to use Facebook and other social media for strengthening innovation networks in Trinidad & Tobago. The findings imply that public sector organization should embark on this tool for facilitating innovation networks in agriculture sector. The public organizations should give emphasis on creating more ties such as, replying or endorsing others in the network. They may target non-profits and producer organizations since these organizations have dense networks and rapid flow of information in their networks. Although substantial numbers of private organizations are using Facebook they might miss opportunities to get connected to strategically important nodes in their page networks. The producer organizations need to use the Facebook to reach out to large and diverse audience, and broker information among their contacts.

**References**


Farmers’ Perceptions of Leadership Skills in the National Farmers’ Group of Trinidad

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Introduction / Theoretical Framework / Literature Review
Farmers’ groups are a formal expression of collective action enabling farmer empowerment (Meinzen-Dick & DiGregorio, 2004) and Trinidad and Tobago’s (T&T) government has increased focus on their development and sustainability (Ramdwar, Stoute, & Ganpat, 2014). However, the effectiveness of leadership within these groups is relatively under-researched (Ramdwar, Ganpat & Bridgemohan, 2013) despite groups often failing. Ramdwar et al. (2014) found extension officers partially attributed the short survival of farmers’ groups to a lack of leadership, stability, and trust. This exploratory study sought to gain a broad understanding of the performance of leadership in farmers’ groups based on the Three-Skill Model (TSM) of leadership (Katz, 1955).

Katz (1955) outlined three leadership skills: (a) technical, (b) human, and (c) conceptual. Technical skills refer to an “understanding of, and proficiency in a specific kind of activity, particularly one involving methods, processes, procedures, or techniques” (Katz, 1955, p. 34). Human skills represent the leader’s ability to work well within groups. Conceptual skills describe the leader’s ability to view the organization holistically over the long run.

In T&T, the Agricultural Society of Trinidad and Tobago (ASTT) is a statutory body within the Ministry of Food Production, Land, and Marine Affairs and the only umbrella organization representing registered farmers. The ASTT Board of directors is considered top-level management, and is responsible for location-specific farmers’ groups. At higher managerial levels, such as the ASTT, conceptual skills are of utmost importance (Katz, 1955).

Purpose and Objectives
This study sought to describe farmers’ perceptions of the ASTT boards’ leadership performance in Trinidad. The objectives were to describe perceptions of the board’s technical, human, and conceptual leadership skills and to determine if differences existed between the perceived performance of those skills.

Methods
This causal-comparative study included active members of ASTT-recognized farmers’ groups throughout Trinidad. No reliable database of ASTT membership exists, therefore convenience sampling was used. The sample was 125 active farmer members of ASTT groups, surveyed in July and August of 2017.

A panel of experts consisting of three agricultural leadership faculty members reviewed the instrument for validity. Survey items used to measure the TSM constructs were revised based on
their feedback. The revised instrument was administered via face-to-face interviews with farmers. Most respondents were male (70%) and had primary level education (56%). On average, farmers were 44 years old with approximately 16 years of farming experience.

Internal reliability of the instrument was measured via Cronbach’s Alpha. Results indicated constructs for technical (T), human (H), and conceptual skills (C) had acceptable internal consistency (T = .81, H = .73, C = .89). Frequencies were used to describe performance of leadership skills and a comparison of construct mean scores via nonparametric procedures was used to describe differences in performance of these skills.

**Results**

Farmers perceived the ASTT leadership performance was moderate across technical, human, and conceptual skills. For technical skills, farmers generally agreed the ASTT board had a great deal of knowledge about agriculture. However, only 16% of farmers strongly agreed the ASTT board provided training for farmers to become leaders of the farmers’ group. For human skills, farmers tended to agree the ASTT had a high level of concern about farmers’ wellbeing, but no farmers strongly agreed that the ASTT helped to manage conflicts within the farmers’ group. For conceptual skills, most farmers agreed the ASTT board discussed a long-term vision to improve farmers’ wellbeing, while only 7% of farmers strongly agreed that the ASTT board could explain the major problems facing the group.

Results of a Friedman test indicated a statistically significant difference in perceived leadership performance between the three types of leadership skills ($X^2 = 12.01, p < 0.01$). Based on follow-up contrasts via a Wilcoxon signed rank test, there was a statistically significant difference in perceived leadership performance between technical skills (M = 3.68, SD = .65), and human (M = 3.44, SD = .48) and conceptual skills (M = 3.50, SD = .72). The ASTT board was perceived to exhibit significantly better technical skills as compared to human and conceptual skills.

**Recommendations/Implications**

Leadership training focused on developing conceptual skills should be provided to the ASTT board. Katz (1955) noted conceptual skills are most important at higher levels of the organizational hierarchy. Additionally, farmers perceived the ASTT board was not skilled in managing conflict, which may account for the trust issues in farmers’ groups noted by Ramdwar et al. (2014). Increasing the capacity of the ASTT board to lead effectively would likely improve the longevity of T&T’s farmers’ groups.

**References**


Gender Issues in Land Acquisition and Production Yields: A Mixed Methods Study of the Yilo Krobo District, Ghana

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Introduction
The rising economic growth in Africa is closely tied to agricultural development (New Partnership for African Development, 2013). In Ghana, the agricultural sector has been recognized as the backbone of the country’s economy, employing 55% of the labor force (Benin, Mogues, Randriamamonjy and Cudjoe, 2007). Women in Ghana constitute 51.8% of farm labor and agricultural workers (Ministry of Food and Agriculture, 2011). In spite of their importance to the agriculture sector, inequality in access to, and ownership of land is hampering women’s ability to fully participate in agricultural pursuits.

Customary law governs 80% of Ghana’s land, providing rules and norms for land tenure that are adhered to by communities (Vigneri & Holmes, 2009). Strategies to acquire land include inheritance, rent, and sharecropping, but these strategies favor men, thus limiting women’s access to farmland (Spichiger & Stacey, 2014).

Yilo Krobo District is a patrilineal community in eastern Ghana where 57% of the population farms (Ghana Statistical Service [GSS], 2014). In this region, land ownership is male biased with women having little or no control. In a patrilineal line of land inheritance, women typically do not inherit land from their parents or husbands, resulting in less access to farmland (GSS, 2014).

The Women’s Empowerment in Agriculture Index (WEAI) was used to structure this study (Alkire, Meinzen-Dick, Peterman, Quisumbing, Seymour, & Vaz, 2013). The WEAI dimensions of production and access to resources formed the framework for this research.

Purpose and Objectives
The purpose of this study is to explore the differences in land acquisition strategies, size of land in production, and production yields of male and female small-scale farmers in Yilo Krobo District in Ghana.

The objectives are to:
1. Assess the land acquisition strategies of male and female small-scale farmers
2. Explore production yields and land size
3. Determine inequalities in land access and production yields

Methodology
An explanatory mixed-methods design was used in this study; quantitative data were collected and results were used to develop qualitative questions (Creswell & Plano-Clark, 2011). The sample for the first phase of the study included 100 farmers, 50 males and 50 females, selected using non-probabilistic convenience sampling procedures (Creswell & Plano-Clark, 2011).
Participants were from the rural areas of Somanya and Nkrukan, and the urban areas of Huhunya and New Somanya.

A structured questionnaire was developed and used to obtain information on land acquisition techniques and production yields from the previous and current year. The questionnaire was piloted in Somanya and Huhunya. Results were used to modify the final questionnaire and develop questions for focus group discussions (FGDs).

Four FGDs with eight to 12 participants per group were held in New Somanya and Nkurakan villages. In each village, a group of male farmers and a group of female farmers participated in the FGDs, which were recorded, transcribed, and coded for themes.

Results
Results for objective one indicated that 70% of males inherited their land, 16% purchased, 12% sharecropped, and 2% were land caretakers. Only 26% of females inherited their land, 24% purchased, 22% rented, 22% were land caretakers, and 6% sharecropped.

To address objective two, cross tabulation of land size by gender was done. Results indicated that 56% of women farmed less than one acre of land and 44% farmed 1-3 acres. No women farmed more than three acres. Eight-two percent of men farmed more than one acre, 60% farmed between 1-3 acres, and 22% farmed more than 3. Production yield results show that although female farms are smaller, they yield more than males.

During the FGDs, females who inherited land disclosed they are not given control rights; male family members decide what crops must be grown on the land. Female farmers also disclosed that they are ordered by males to grow non-staples that generate less income. Even when they grow staples, they intercrop with vegetables and pulses. Both gender groups were asked why females have higher production yields. Females’ responses ranged from being more hardworking, dedicated, and efficient laborers. Males responded that females have knowledge of traditional farming and pest control practices handed down by their mothers.

Conclusions and Recommendations
This study shows that though land acquisition in this region of Ghana is biased against women, their productivity surpasses that of male farmers. Recommendations for extension practitioners include educating female farmers about existing land laws, which provide them with certain rights to inheritance. In rural areas like Yilo Krobo, few women know their rights; providing them with this information could empower them significantly. Conducting community sensitization workshops to teach local leaders about women’s contribution to agriculture could assist in shifting the perception of women as less valuable in the agricultural sector. Finally, extension practitioners could work with private, non-profit, and government entities to connect female farmers to credit programs to help them purchase additional land.

References


185
Group Cohesion: Application of Best Horticultural Practices

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Introduction
Kenya is a chief horticultural produce exporter in sub-Saharan Africa where the sector generates over $300m in foreign exchange per year and employ approximately 4.5m people (HCDA, 2014). The main problems besetting the sector are unavailability of funds, inadequate access to affordable credit, non-compliance with health or safety standards, and low application of key inputs. Farmer groups can be a means to overcome these constraints especially those faced by individual smallholder farmers. According to Marsh, (2003) farmer groups are crucial organizations for the empowerment, poverty mitigation and improvement of farmers’ lives. Hoegl & Proserpio, (2004) argued that if people are closer to one another, their cohesiveness is strengthened making performance better. However, performance gained from larger group membership may be counteracted because cognitive and emotional resources for forming personal relationships are quickly exhausted in larger groups (Mueller 2011).

Theoretical Framework
This study was grounded on relational cohesion theory which proposes that frequent exchanges between people result in positive emotions (Lawler & Yoon, 1993). Lawler and Yoon (1996) assume that people form relationships to get something they need. If increasing size reduces the frequency of interaction between members of groups, then cohesion theory would predict that larger groups will have lower trust, produce less positive emotions, and have less cohesion than smaller groups (Lawler, Thye & Yoon, 2008). This can be taken to mean that farmer groups with less membership will apply the best horticultural practices more than those groups with large number of members.

Purpose and Objectives
The intent of this study was to analyze the influence of group’s cohesion on application of best practices. The objectives were to examine the association between group sizes and cohesiveness, and determine the association between cohesion and application of horticultural practices.

Methods/Procedures
The study was conducted in Meru County involving 35 horticultural farmer groups. A correlational research design was adopted to determine the relationships between variables (Fraenkel & Wallen, 2009). Stratified random sampling was used to select a sample of 112 from a population of 1950 farmers. The sample was considered adequate at alpha level of 0.05 (Bartlett, Kotrlik, & Higgins, 2001). A panel of experts and peers reviewed the questions to ensure validity. A five point Likert-type scale was used. Cronbach’s Alpha was computed to establish internal consistency (0.86). Pearson correlation was used to determine the association between group cohesion and application of practices.
Results/Findings
The results indicated that majority of the horticultural farmers (85.5%) owned between 1.5 and 3 acres and were aged between 20 and 50 years (85.7%). Most of the farmers (76.8%) were male and had secondary education (51.8%). Almost half the groups (45.5%) had sizes of between 25 and 54 members, held meetings once a month (59.8%) and had been in existence for 4 years and above (46.4%). A Majority (71%) of farmers indicated the level of cohesion among members of their groups was very high as demonstrated by active participation in group activities (4.57).

The study established a high level use of best practices where farmers avoided production of crops near potential harmful substances (4.88), applied the right amount of organic manure (4.87), and inorganic fertilizers (4.80). They protected their fresh produce from contamination by dust, rain or sunburn (4.83), cleaned the storage areas (4.89), prevented build-up of pests (4.72) and maintained soil by applying mulch or growing cover crops (4.41). Most farmers used clean clothes, gloves when harvesting (4.53) and clean containers when handling the produce (4.97). They harvested crops using appropriate techniques (4.81), correct maturity index (4.94) to ensure that they were of good quality. The study established a weak negative significant correlation between group sizes and the level of cohesiveness \( (r = -0.267, p < .05) \) and a significant moderate, positive correlation between group cohesion and application of appropriate horticultural practices, \( (r = 0.393, p < .05) \). The findings agreed with those of Ratner, et al., (2014), Sapran (2010) and Ofuoku & Agbamu, (2012). The study concluded that group cohesion was associated with application of best horticultural practices.

Recommendations
In an effort to improve and sustain cohesiveness in the farmer groups, extension agents need train the farmers on good group management and leadership since cohesiveness is related to application of appropriate horticultural practices. The group managers need to limit the group sizes to maintain a high level of cohesion and also sustain a conducive environment that allows mutual respect. Understanding that group cohesion tends to decrease as group size increases, group managers should take special precautions to retain cohesiveness as group membership grows. Research is needed to address problems facing the management of the groups and factors that impact on them.

References


Haitian Agricultural Faculty Preparation for Their Academic Roles

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Introduction and Theoretical Framework
Food insecurity is still a reality according to the Global Hunger Index. In 2016, seven countries, including Haiti, had an alarming level of hunger (von Grebmer et al., 2016). Education and food security are connected through the role of universities in producing professionals with the knowledge and skills necessary to enhance food production (Mutimba, Knipscheer, & Naibakelao, 2010). Agricultural education therefore must stay up-to-date on the fast scientific and technical changes in agriculture (Van Crowder, Lindley, Bruening, & Doron, 1998), which is why professional development is critical (Camblin & Steger, 2000). Many countries in the Latin America and Caribbean (LAC) region have struggled with the quality of their higher education system despite the expansion in number of universities (Torres & Schugurensky, 2002; Urzúa, 2002). Empirical research on the Haitian context is not abundant. This study addresses this issue.

The study uses constructionism as theoretical perspective based on individual understanding of phenomena (Crotty, 1998). Experiential learning emphasizes that learning builds on each learner’s previous experiences (Roberts, 2006). Adult learning theory also helped us understand the target population (Knowles, Holton, & Swanson, 2015). The conceptual framework from Darling-Hammond puts teacher preparation inside the social context of both the teacher and the students while also taking into account teacher’s knowledge of subject matter and pedagogical skills (Bransford, Darling-Hammond, & LePage, 2005).

Purpose and Objectives
The purpose of the study is to understand the preparation of faculty from Haitian colleges of agriculture, examining areas for professional development and their previous preparation for their academic roles.

Methods
The study was qualitative (Flick, 2007), using individual semi-structured interviews of lecturers from five Haitian colleges of agriculture that are members of the Caribbean Council for Higher Education in Agriculture (CACHE). Using a snowball technique (Merriam, 1998), we interviewed 37 faculty members from Université d’Etat d’Haiti - Faculté d’Agronomie et de Médecine Vétérinaire, American University of the Caribbean, Université Caraïbe, Université Notre Dame d’Haïti, and Université Quisqueya. Interviews were conducted in French in a face-to-face format in a convenient place for each participant. Data were analyzed using line-by-line coding (Gibbs, 2007) in French and then translated in to English.
Results and Conclusions

Most participants (60%) graduated from the institutions of which they were currently employed and felt they were adequately prepared to do their job. They believed they learned a wide range of skills, citing leadership and communication most frequently. Some participants did express concern with their academic preparation related to organizational professional development. Some of the interviewees mentioned seeking other informal learning opportunities on their own to compensate for this shortcoming, however most noted very little or no monetary compensations or career impacts as a result of professional development. Many interviewees reported having participated in professional development opportunities outside of the country which they found beneficial. Participants identified 56 specific topics of interest as the focus for future professional development. The topics represent six broader categories. Fourteen faculty members cited topics relating to Social Sciences such as leadership, communication, ethics, and gender, and agricultural development. Plant and Crop Science/Production had the most diversity within a category with participants naming 15 different topics. Other areas identified included Animal Production, Food Science/Safety and Nutrition, Environmental Science/Natural Resources, or Research Methods and Approaches. Finding consensus on the most important topics was challenging. Approximately 30% of the topics (n=17) were named by more than one participant and only two topics were identified by more than three participants (human resource management [n=5] and leadership [n=4]). More than half of the topics (69%) were suggested by a single participant. Only three lecturers identified professional development needs related to curriculum development or teaching methods.

Recommendations

Further investigation could examine how perceptions of faculty preparedness are affected by the fact that many worked at their alma mater, and many worked for multiple universities. Additional research could also study the extent to which the graduate programs attended by Haitian faculty address teaching-related topics. Finally, institutions could investigate models for providing formal professional development to faculty. More research on students and employers’ perceptions are necessary to have an overall look at the ability of Haitian educational institutions to provide agricultural education that prepares students to enter the workforce and effectively address the food security needs of the country.

References


Haitian Faculty Members’ Perceived Self-Efficacy of Student Engagement, Instructional Strategies, and Classroom Management

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Introduction
Food security takes precedence as one of the top global challenges faced (Hutt, 2016) and largely affects developing countries, such as Haiti (von Grebmer et al., 2016). According to the Food and Agriculture Organization (2008), one concern regarding food security is the degree in which individuals are financially and physically able to access food. One known way to assist the food security challenge is through education. The role of the university can supply individuals with the knowledge and skills necessary to sustain a viable and plentiful food production system (Mutumba, Knipscheer, & Naibakelao, 2010). However, faculty members in these impoverished countries may not be equipped with the pedagogical skills and knowledge to effectively deliver course content and skill acquisition. Teacher self-efficacy is influential to students’ academic achievement (Mojavezi & Tamiz, 2012). Therefore, examining teacher self-efficacy among faculty in these countries is a crucial step in determining if faculty are prepared to accomplish this task. To assist in increasing the self-efficacy of faculty for the betterment of student achievement, professional development is needed (Yoo, 2016). The faculty development academy was created to provide a platform for the professional development of Haitian faculty.

The purpose of the academy is to equip Haitian faculty with the pedagogical skills needed to be effective teachers. The academy included three sessions focusing on curriculum design, teaching methodologies, and scholarship of teaching and learning. The sessions were held on three different dates throughout the year. The theoretical frameworks that guided this study were Bandura’s (1977) self-efficacy theory and Tschannen-Moran and Woolfolk Hoys’ (2001) teacher self-efficacy.

Purpose and Objectives
The purpose of this study was to determine Haitian faculty members’ perceived self-efficacy regarding their ability to teach. The following objectives guided this study, (a) determine teacher self-efficacy in student engagement, (b) determine teacher self-efficacy in instructional strategies, and (c) determine teacher self-efficacy in classroom management.

Methods
The data for this study were collected face-to-face by the in-country training coordinator during the beginning of the session of the faculty development academy. Data were collected using the Teachers’ Sense of Self-Efficacy Scale (TSES). The TSES was used to determine participants’ sense of efficacy regarding their ability to teach. Data were analyzed using descriptive statistics.
Results
The following results are aggregated from an assessment of participants’ perceived teaching self-efficacy. The construct means for faculty members’ perceived self-efficacy were (a) student engagement (M=6.75, SD=.98), (b) instructional strategies (M=6.43, SD=1.14) and (c) classroom management (M=6.06, SD=1.96). The item with the highest mean within student engagement was how much can you do to help students think critically (M=8.20, SD=1.08). The items with the lowest means were how much can you do to get through to the most difficult students (M=5.77, SD=2.74) and how much can you do to get students to believe they can do well in school work (M=6.47, SD=2.20). The item with the highest mean within instructional strategies was to what extent can you provide an alternative explanation or example when students are confused (M=7.75, SD=.87). The items with the lowest means were how well can you provide appropriate challenges for very capable students (M=5.93, SD=2.55) and how well can you respond to difficult questions from your students (M=6.07, SD=2.59). The item with the highest mean within classroom management was to what extent can you make your expectations clear about student behavior (M=7.00, SD=1.47). The items with the lowest means were how well can you establish routines to keep activities running smoothly (M=5.36, SD=2.87) and how well can you respond to defiant students (M=5.53, SD=3.20).

Conclusions and Recommendations
The findings revealed Haitian faculty members had quite a bit of self-efficacy regarding student engagement, instructional strategies, and classroom management. However, when examining individual item means, there were areas where faculty did not perceive to be self-efficacious. Instead the faculty felt some influence on how much they could do to get through to the most difficult students, how well they could provide appropriate challenges for very capable students, how well they could establish routines to keep class activities running smoothly, and how well they could respond to defiant students. Professional development should be provided in the areas of student motivation, differentiated instruction, and classroom management to increase faculty members’ self-efficacy in the spaces where they only perceived to have some influence. Determining the self-perceived level of self-efficacy of the participants after the faculty development academy would assist in assessing the differences associated with engagement in a professional development activity of this kind. Obtained results from the post-data collection could then guide future teacher professional development initiatives.

References


Identifying the Capacities Rural Advisory Service Networks Need to Support Global Professionalization

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Introduction
Rural advisory service (RAS) providers also referred to as extension professionals, support farmers by collecting, organizing, and disseminating research-driven techniques that enhance agricultural production (Khurshid, Khan, Pervaiz, Khan, & Nawaz, 2017). They operate through a global network to address the technological information needs of farmers (McCole, Culbertson, Suvedi, & McNamara, 2014). However, poor coverage of RAS and low literacy rates have resulted in fragmented RAS systems within many developing countries (McCole et al., 2014). As RAS providers hail from diverse backgrounds, there is a need for norms and standards to maintain a global identity (Cohn, Fehr, & Maréchal, 2017). Lack of standards for RAS networks has led to inconsistent professional development efforts (GFRAS, 2015). Davis and Terblanché (2016) found professional development was ranked as a top need within the literature in South Africa and across the globe. However, limited research is available on the process of professionalizing RAS and the required capacities for a RAS network to support these efforts.

Purpose and Objectives
The purpose of this study was to identify the capacities needed for a RAS network to support the professionalization of RAS. The objectives were to (a) create a comprehensive list of potential capacities a network may need to support the professionalization of RAS, and (b) build a global consensus on the capacities necessary for a network to support the professionalization of RAS.

Methods
A modified online Delphi method with three iterations was used to reach the objectives. A total of 31 individual RAS professionals were purposively sampled from around the globe. In the first-round respondents (94%, n = 29) were asked to list the five most important capacities for effective professionalization of RAS. Responses were thematically analyzed and aggregated to develop the second-round questionnaire. The second round used a five-point Likert-type scale (1 = Strongly Disagree to 5 = Strongly Agree) to indicate a respondents’ (87%, n = 27) level of agreement or disagreement regarding the importance of the capacities identified in round one. Each item receiving a mean score greater than 3.25 were used in third round. In the final round respondents were asked if an item should be retained. Those receiving a positive response from more than 75% of the respondents (94%, n = 29) were retained.
Results
Round one resulted in 122 individual statements that were thematically reduced to 34 individual items. All 34 items were retained in round two with a mean score of 3.25 or greater. Only 70.6% (n = 24) of the items were retained in round three. The top capacities with 96.6% consensus in the third round were the need for a RAS network to advocate for professionalization, provide an effective platform for information exchange and communication, and provide a clear vision of the role of a RAS professional. The capacities with 93.3% consensus were the need for RAS networks to support the development of appropriate program monitoring and evaluation systems and provide opportunities for collaboration and networking with external stakeholders. The capacities with 89.7% consensus were that RAS networks should build relationships with universities and learning institutes to provide education and skill development for RAS professionals, enhance the knowledge of educational practice, and provide opportunities for communication with external stakeholders. Fifteen additional capacities were identified and include providing opportunities for professional development plan creation, leadership development, encouraging and supporting needs assessments, and providing incentives for engagement in best practices.

Conclusions and Recommendations
The results revealed RAS networks need to establish what a RAS professional is and build a common language that defines a RAS professional. Once this definition is established and agreed upon globally, collaborative global advocacy efforts across RAS networks should focus on encouraging policy that leads to financial support for the professionalization of the newly defined RAS professional. Financial resources should then be used to establish a knowledge management platform that can facilitate information exchange and communication that will eliminate the fragmented RAS systems within many developing countries (McCole et al., 2014) and create a sense of community across RAS providers and services despite country of origin. Given RAS providers hail from diverse backgrounds, an establishment of norms and standards for the RAS professional will assist them in creating a global identity (Cohn et al., 2017). This global identity should lead to the development of a synonymous vision and mission for RAS that RAS providers can refer to no matter the part of the world they are serving. Further research should determine if the 13 already established RAS networks have the capacities identified by the global experts in this study.

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Identifying the Values Typology of Mexican Project Managers

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Introduction
Understanding a culture’s view on interpersonal skills is imperative for international agricultural educators when creating and implementing curriculum. Culture largely influences individual values which are the driving force in decision making and behavior. Values can depict quality of work and how leaders, project managers in this case, may treat coworkers and subordinates (Johnson, 2016). Etling and Radhakrishna (1998) found Mexican participants in non-formal education programs valued and desired information on leadership development. The Global Leadership and Organizational Behavior Effectiveness (GLB) study took an intensive look at 62 countries to form 10 distinct cultural clusters and found the number one desired leadership behavior for Latin American countries was Charismatic/Value-Based Leadership (House, 2004). Values-based leadership is defined as “the ability to inspire, to motivate, and to expect high performance from others based on strongly held core value” (Northhouse, 2016, p. 440).

Purpose and objectives
In the current climate of international leadership development, values-based leadership is a key component to effective leadership. Because of this, it is imperative leaders understand their values typology in order to create an authentic leadership development plan. The objective of this study was to assess the values-base typology of Mexican project management professionals in a certification program.

Methods
Fifteen participants of a Project Management Certificate program in Mexico City, Mexico participated in this study. This certificate program was a partnership between [university in Mexico] and [university in the US]. The participants included four men and eleven women whose experience in project management ranged from one to 35 years.

One component of the certificate program was values based leadership and its impact on organizational vision, mission, and effectiveness. This section of the curriculum was framed by Rescher’s (2005) values epistemology which breaks value typologies into material (tangible items), political (justice and power), aesthetic (beauty and symmetry), social (interpersonal relationships), moral (honesty and fairness), religious (faith), theoretical (intelligence and knowledge), and economic (efficiency and productiveness). Veinhardt and Gulbovaite (2016) created a modified questionnaire based on Rescher’s work that, after expert evaluation for validity, removed material, moral, and religious typologies because of skewed data, thus leaving five typologies. The instrument has 12 statements per value type. Instruments were completed during the certificate program and Excel was used to analyze the results.

Results and conclusions
Of the 15 participants, nine social values cumulative scores ranked as first in importance. This correlates with the GLOBE study which found Latin America has a strong inclination toward...
charismatic and team-oriented leaders (House, 2004). Three of the nine were also tied with theoretical in terms of importance. Two additional participants reported theoretical as the value system most important. While the GLOBE study does not specifically monitor theoretical based leadership, it can be concluded that individuals who elected to participate in the certification program did so to increase their knowledge in project management and leadership concepts, thus making theoretical values an important values-base.

Three participants ranked economic values as the most important value system in their leadership. This supports the work of Tuttle, Lindner, and Dooley (2004) who found Mexican participants often wanted practical and useful information to increase productivity. The three participants who ranked economic as imperative ranked social second in importance. It can be concluded that the economic value epistemology derives from their task-oriented role as a project manager, but they also see the value of social interaction in those completing the project.

**Recommendations and implications**

Understanding one’s personal values epistemology is the first step in values-based leadership development (Bass & Bass, 2008). Because charismatic/values-based leadership has been found to be the preferred method of Latin American leadership, international extension educators should be cognizant of including this concept in interpersonal development trainings.

Although findings for this study cannot be generalized, they suggest the GLOBE study is a valid model to use in developing curriculum for Mexican project managers. Both social and economic values play an important role in leading project management initiatives in agricultural development. Understanding personal value typology will improve the ability for international extension educators to celebrate the intersection of human, natural, and cultural systems.

**References**


Impact of Gender on Opinion Leadership and Willingness to Act on Water Issues

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Introduction
Water has always been and continues to be one of the major issues facing the developed and developing world. According to the United Nations, 663 million people lack quality drinking water sources (United Nations, 2017). Water is also fundamental for livelihoods and important for maintaining economic stability (Carboni, Gluhak, McCann, & Beach, 2016). Given the present condition of water around the world, the public needs to save water by adopting conservation practices (Tong, Fan, & Niu, 2017). A recent study conducted in China found differences between males and females in both their water consumption and adoption of water conservation practices (Tong et al., 2017). In addition, opinion leaders are known to have a strong level of influence within their communities (Yukl, Gordon, & Taber, 2002) and can be leveraged to spread information quickly and encourage the adoption of new practices (Lamm, Lamm, & Carter, 2014). However, little is known about the levels of opinion leadership expressed by males versus females when it comes to water issues implying that identifying gender differences in opinion leadership and willingness to act on water issues could help extension program development when targeting opinion leaders.

Purpose and objectives
The purpose of this study was to determine if gender influences the relationship between level of opinion leadership around water issues and willingness to act to conserve and protect water resources to determine how extension programs can be further targeted and increase impact. It was guided by the following objectives: (a) identify the relationships between opinion leadership and willingness to act for male and female respondents, and (b) determine if gender influences the relationships between level of opinion leadership and willingness to act.

Methods
An online survey was sent to U.S. residents using a non-probability opt-in sampling technique with a total of 1,050 (Female = 538, Male = 512) respondents. Level of opinion leadership was measured using Childers (1986) scale found reliable in the literature. Willingness to act was measured using a researcher-developed five-point Likert-type scale of 20 statements requesting respondents indicate how likely or unlikely they are to engage in specific water conservation and protection behaviors (1 = Very Unlikely to 5 = Very Likely). Indexes were developed for both by taking the average of the combined items (1 = low, 5 = high). The Cronbach’s alpha for opinion leadership and willingness to act were 0.89 and 0.93, respectively. The survey was reviewed by a panel of experts and pilot tested prior to distribution. Data obtained was analyzed using correlations and one-way ANOVAs and interpreted using Davis’s (1971) convention.

Results
Results from the correlation analysis revealed there was a statistically significant moderate positive relationship between opinion leadership and willingness to act within female respondents (r = 0.48) and a substantial positive relationship within male respondents (r = 0.62).
When compared using a one-way ANOVA, the male and female respondents were significantly different in their level of opinion leadership (F (1, 1047) = 10.03, p = 0.00) with females expressing a higher level of opinion leadership than male respondents. However, there was not a significant difference in their willingness to act on water issues (F (1, 473) = 0.675, p = 0.41).

**Conclusions and Recommendations**

Based on the correlation analysis, it can be inferred that as opinion leadership increases, willingness to act on water issues increases whether male or female and that females currently express a higher level of opinion leadership. Results from the ANOVA found that female and male respondents differed in their level of opinion leadership about water issues but not their willingness to act. Lamm, Lamm, and Carter (2015) found opinion leaders had a higher level of water knowledge than the general public. Since opinion leaders influence others (Yukl et al., 2002), gender-based education provided to opinion leaders related to communicating about water issues may result in increased willingness to act and conserve water. With females expressing higher opinion leadership, educating them on water conservation is recommended. This study was conducted in the U.S., but for wider understanding it should be replicated in other parts of the world to examine if the findings are the same in the developed and developing world. Further research identifying the influence of socio-economic status on the level of opinion leadership and willingness to act on water issues should also be conducted.

**References**


Impact of Heifer International Programs: A Case Study of NGO Agricultural Extension in Africa

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Introduction/ Review of Literature
Heifer International (HI) is a non-profit dedicated to improving the lives of those in poverty through the gift of income generating livestock. Dan West founded this organization as an alternative to hand-out methods by teaching and empowering. Heifer International aims to use livestock as an integral component of sustainable agriculture, environmental improvement, and holistic development (Henderson, 2003) Once a family’s gifted animal produces a female offspring, that female is then passed on to another family. Along with the animal, the original family will pass on any relevant training necessary to continue growing the female offspring. Ideally gifts are spread across a community and together they generate income and improve their nutrition.

Agricultural and extension researchers have studied HI and to understand the importance of analyzing the livelihood of smallholder farmers (Manganyi, 2006). Often there is a disconnect between small farmers and access to credit, especially for females who are the most marginalized but have the most connection to their families (De Vries, 2008). By gifting animals, HI closes the gap between small rural farmers and the greater economic market, giving them a tool to generate income without falling deeply into debt. HI has an extensive global presence and has evolved to providing families with clean water, business training, and various other incoming generating tools. Through all these services they are working to feed and empower developing regions. As a non-profit, maintaining accountability is crucial. There is little research into the impact of HI’s animal gifting (Rawlins, 2013). Recently, researchers have started to assess the success of HI’s projects. Additionally, HI has started posting reports on their website, and being more transparent about their effectiveness.

Purpose and Objectives
This case study focused on assessing the impact of African dairy livestock on the families in the HI program. This study analyzed the extent donated animals impacted the targeted program communities. Furthermore, the study will understand the economic, nutritional, and cultural impact of dairy animals donated from HI in Africa.

Methods and Data Sources
Case studies of current and past HI animal recipients were analyzed as part of a literature synthesis. This study examined the cultural, nutritional, and financial impacts of donated animals on the family or recipient. Case studies allow for analyzation of a topic from many different points of view (Yin, 2013). Case studies allow for all parties to be represented in the research, even the marginalized. To comprehensively understand the impact of HI’s project, case studies within different contexts were assessed and compared. Furthermore, due to context case studies role in examining international agricultural and extension education is important.
Results
As a non-governmental organization (NGO), HI and other external organizations continue to provide studies on the impact of their programs. In rural Ruli, Rwanda the role of donated dairy cows continues to be evaluated. Additionally, Kirehe, Rwanda a more goat prominent region is being studied (Rawlins, 2013). With help from the Ministry of Agriculture, Rawlins has summarized that in these districts household dairy consumption and goat meat consumption is increasing, demonstrating a positive nutritional impact (Rawlins, 2013). Additionally, in the Mchinji district of Malawi, research is being done on the Heifer Malawi Smallholder Dairy Development (MSDD) project (Fitzpatrick, 2017). With help from USAID, researchers are examining the social impacts HI has on the region. Furthermore, across Rwanda researchers are studying the effects of training provided with the donated animal (Argent, 2014).

Recommendations
A topic that fails to be addressed is the role of local dairy breeds. HI and other NGO’s will bring non-native dairy species into the regions they are trying to help. Research is needed comparing the attributes of local breeds versus imported dairy breeds. The imported breeds may not fit the cultural norms and therefore, are not compatible with targeted farmers. The resources local breeds provide could benefit the region economically and culturally. Previous agricultural and extension researchers have experienced problems with livestock contracting diseases and producing low yields (Arispe, 2003). Improving genetics could help increase resistance to disease and increase yield. Thus potentially creating an avenue for income generation through a genetics project that integrates the local breeds with the imported breeds.

The sustainability of these projects has not been presented. HI should consider the long-term impact, combining the cultural, nutritional, and financial impact components of their projects. HI should continue to work with the local Ministry of Agriculture and USAID to provide transparency for their projects regardless of location. HI should extend this transparency to their website, where donors can easily track the impact of HI’s ongoing project. Through the continued partnership with local organizations, HI is creating a pathway for increased international agricultural extension education.

References


Improving Livelihoods through Youth-Adult Partnerships involving School-based, Agripreneurship Projects (SAPs): The Experiences of Adult Partners in Uganda

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Introduction
Youth unemployment and underemployment have reached alarming levels in many regions of the world. In Africa, during the next 30 years, more than 300 million youth will search for employment while two-thirds live in rural areas (International Youth Foundation, 2014). Engaging youth in agripreneurship is vital to mitigating the challenges of unemployment and ensuring food security (International Labor Organization, 2014; Mukembo, 2017), including development in rural areas to improve livelihoods. This aim could be achieved through Youth-Adult Partnerships (Y-APs) by which youth and adults work together on agricultural projects of mutual interest. Y-APs involve interactions and cooperation between youth and adults to share ideas, to make decisions and policies, and implement such to improve their communities (Akiva & Petrokubi, 2016; Zeldin & Petrokubi, 2008).

Theoretical Lens
Guba (1981) posited: “Adherents of the naturalistic paradigm prefer to have the theory emerge from the data themselves” (p. 78). According to Lester (1999), in phenomenological inquiries, researchers ought to develop their theoretical lens from the findings to ensure validity and transparency in their studies. Based on data analysis, the theory of experiential learning, as espoused by Kolb (1984), emerged from this phenomenology’s themes and essence.

Purpose
This study sought to describe the adult partners’ experiences in regard to school-based, agripreneurial projects (SAPs), including the potential of such to improve agricultural practices and livelihoods. Ugandan high school students raised broilers as their SAPs and received training on entrepreneurship from agriculture teachers, extension educators, and poultry farmers, i.e., the study’s adult partners. As part of a larger investigation, this portion was guided by one overarching question: What were the adult partners’ experiences regarding their interactions with the students?

Methods/Data Sources
The phenomenological approach was used to derive meaning from the adults’ lived experiences. Eight adult partners were purposively selected and interviewed via Skype (Deakin & Wakefield, 2014) using a semi-structured interview protocol (Creswell, 2013; Patton, 2015). Data collection and analysis were undergirded by Tracy’s (2010) eight guidelines for qualitative research to ensure a quality study. Interview data were coded and analyzed using NVivo 11 analysis software (QSR International, 2013, 2016); eight themes and seven subthemes emerged. “A
Results/Conclusions

Four of the study’s themes and its essence (Moustakas, 1994) are described here.

Theme #1: Improved understanding of and interest in agripreneurship and related opportunities for students and adults. The adults acknowledged improvement of students’ and their understandings of agripreneurship concepts by the project’s end. Both became more interested in starting agripreneurship projects in the future.

Theme #2: Increased understanding of poultry science knowledge and its implementation outside of the classroom. The agriculture teachers observed that students who participated in the SAPs were more active in class. They responded to questions during discussions with practical examples derived from their SAPs or from experiences with adult farmers.

Theme #3: Improved interaction, networking, and support among teachers, extension educators, farmers, students and their parents. The adult partners described increased interactions and networking among the different stakeholders. One farmer stated: “During the holiday, students called me and made an appointment to visit my farm with their parents,” who were considering poultry farming as an enterprise.

Theme #4: Mutual exchange of ideas and continued interactions between participants in the Y-APs. The participants learned from one another by exchanging ideas and information: An adult partner shared that when students visited one farmer, his broilers were not doing well. The students realized feed was a problem and advised him to change his source of feeds and to improve sanitation practices because the birds had coccidiosis.

The essence of the adults’ experiences from working with the students was the power of Y-APs to promote learning and skill acquisition by youth such that the adult partners were also positively impacted while lifting their communities together.

Recommendations/Educational Importance/Implications

Y-APs may be useful in equipping youth with agripreneurship skills to mitigate unemployment and improve their livelihoods. Such partnerships are mutually beneficial and can be instrumental in helping youth engage in community initiatives and bridge gaps with adults (Libby, Rosen, & Sedanaen, 2005). Follow-up studies should be done with the participants to evaluate the long-term impacts and sustainability of Y-APs to promote agripreneurship while improving agricultural practices and developing communities.

References


Improving the Training of Frontline Extension Workers in Tanzania: A Pilot Curriculum Reform Initiative with the Ministry of Agriculture Technical Institute at Ilonga

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Introduction:
A major goal of the Tanzanian extension service is to improve the agricultural productivity of the nation’s 48 million inhabitants, the majority of whom depend on agriculture as their primary source of livelihood. More recently, concerns have been raised by stakeholders regarding the quality and training of frontline extension workers (FEWs) and their lack of skills to contribute to agricultural productivity, income generation, and market-led agricultural development. Improving the training of FEWs is vital as Tanzania’s agricultural sector transitions and becomes more market and commercially oriented.

The Ministry of Agriculture, Livestock and Fisheries (MALF) through its Ministry of Agriculture Training Institutes (MATIs) is responsible for the training of FEWs at the Certificate and Diploma levels who then are deployed at the village, ward, and district levels to provide extension delivery to rural and urban populations. However, the MATI curriculum and training programs have not been revised for 10 years, training materials and experiential learning opportunities are often lacking, and linkages with external stakeholders including those in the private sector are limited.

In 2016, the USAID funded Innovative Agricultural Research Initiative (iAGRI), in collaboration with Sokoine University of Agriculture’s (SUA) Department of Agricultural Extension and Community Development (DAECD), launched a pilot effort with the MATI at Ilonga, Morogoro Region, to address the challenge of revising its program of study so that it better reflects the changing needs of Tanzanian agriculture and improve the performance and employability of its graduates. This was done by using a competency-based approach that incorporated inputs from four stakeholder groups into the curriculum assessment and revision process.

Purpose and Objectives:
The main purpose of this study was to develop recommendations for curricula revisions and staff development at MATI Ilonga. The main objectives were to: compile a list of competencies needed by FEWs; describe stakeholder assessments of competencies on basis of importance and stakeholder perceptions of FEWs’ ability (competency); and use weighted discrepancy scores (WDS) to prioritize recommendations for curriculum revisions and staff development.
Methods and Data Sources:
The assessment of FEWs’ competencies was conducted with four stakeholder groups including former graduates of MATI Ilonga, employers, farmers and MALF training divisions staff. The process adhered to the training needs assessment model developed by Borich (1980). The first step had a panel of experts from DAECD, MALF, the MATI Ilonga Principal and three external agricultural educators compile a list of competencies needed by FEWs. The final list consisted of 23 competencies, which were validated in additional reviews with DAECD and MALF staff. The second step was to prepare a survey instrument in which stakeholders assessed each competency on the basis of importance and on their perceptions of graduates’ ability (competency) using a five point Likert-type scale ranging from 5=Very High Importance/Ability to 1=Very Low Importance/Ability. The questionnaire was pre-tested with extension professionals and then taken to the field where it was completed by 41 graduates, 20 employers, 120 farmers, and 8 MALF training staff. The third step was to develop discrepancy and WDS for each competency statement to indicate priority areas for curriculum revisions and in-service staff training.

Results and Conclusions:
Findings indicated that all stakeholder-respondents considered all but two of the 23 competencies to be very high importance. They rated the most important competencies to be Communication skills, Climate Change, Business Skills, Value Chains and Land Resource Management.

All stakeholders indicated that the highest mean ability ratings were for Program Implementation, Communication, Livestock Husbandry and Basic Administration Knowledge and the lowest ability for Value Chains, Food Processing, Fisheries and Business skills. FEWs provided the highest mean ability scores for all competencies followed by farmers, employers, with MALF training administrators rating FEWs competencies the lowest.

WDS, were used to determine the gap between importance and ability ratings on each competency, indicated that the five highest rated training needs were, in order, Value Chains, Business Skills, Climate Change, Fisheries, and Land Resource Management. All stakeholder groups except graduates, indicated Value Chains and Business Skills as top priority areas requiring enhanced training to improve the ability of FEWs.

Recommendations, Educational Importance, Implications:
The results indicated two competency areas, Farming as a Business (value chains and business skills) and Conservation Skills (climate change and land resource management), as priorities requiring curriculum enhancement and staff training to improve the training of future MATI students. The importance of using a competency based approach and engaging stakeholders in the review of MATI curriculum has been recognized by MALF, who has expressed interest in applying the approach with other MATIs in the country.

References
Innovation Traits that Facilitate Agricultural Technology and Information Adoption in Brazil

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Introduction
Population increases, climatological change, and policy initiatives all impact developing countries’ need for improved agricultural practices (Pretty et al., 2010). Science and technology have been shown to provide a feasible solution to increase food security (Beddington, 2010). A more transparent exchange of information can facilitate the adoption of agrotechnologies (Carvalho, 2006). Nin, Arndt, and Preckel (2003) found that as agricultural technology adoption increased in developing countries the agricultural production increased at a greater rate.

Knowledge of informational and technological innovation has been shown to be hindered by low levels of awareness in developing countries (van der Gaast, Begg, & Flamos, 2009). Barriers to communication result from limited educational availability, and low degrees of technology adoption (Moriba, Kandeh, & Edwards, 2011). Rogers (2003) proposed in his seminal work that diffusion theory was applicable to many disciplines including agriculture and business.

Purpose and Objectives
The purpose of this study was to evaluate the level of information and technology diffusion in the agricultural sector of Rio Grande do Sul, Brazil. The objectives of this study were:

1. Describe agricultural innovation adoption processes; and
2. Investigate key elements and barriers of information transmission and adoption.

Methods
Research design methodologies utilized to achieve the objectives of the study were descriptive and correlational research. Descriptive research was utilized to provide insight into opinions, attitudes, and practices (Gall, Gall, & Borg, 2007) utilized currently in Brazil to disseminate innovations. Stepwise regression was utilized to address the study’s objectives.

The population for this study consisted of 3,289 agriculturalists in the province of Rio Grande do Sul, Brazil. A random sample of 359 individuals was selected based on farmer’s characteristics. The instruments were administered in person. The dependent variable was the adopter category with the measured elements of voluntariness, relative advantage, compatibility, image, ease of use, result demonstrability, visibility and trialability representing the independent variables in the analysis. The survey was translated from English into Portuguese by Global Speak Translations. Validity of the instrument was assessed by a team of researchers at [university] and [university]. The Cronbach’s Alpha for the instrument produced a 0.86 reliability coefficient.
Results and Conclusions

Descriptive data would be offered in the presentation, if accepted, but are not included here due to space limitations. Following the adopter categories, a stepwise multiple regression analysis was performed to determine which construct elements contributed significantly to the categorization of adopters within the innovation process. The results of the stepwise regression model indicated that the nine measurements from all of the constructs explained 58.6% of the variation in the model.

The output from the stepwise regression model suggested that the innovation adoption category was influenced toward greater degrees of adoption as peer pressure to use innovations mounted on the individual. The stronger belief that innovations increased productivity and suited the individuals work style was also noted to enhance the degree of adopter category as was the compatibility of the innovation with the individual’s work, the perception of using technology as a status symbol, the perception that technology is easy to manipulate, observing others in the community using technology, the ability to easily communicate technology, and the ability to properly test a new innovation were found to enhance the adoption process.

The second objective was to examine key elements and barriers of information transmission and adoption. The stepwise regression used a dummy variable for adopter type as the dependent variable where adopters were identified with a zero and non-adopters were identified by one. The identified construct elements that most significantly impacted non-adoption were then used to characterize the components of innovations that contributed to barriers to adoption. The construct measurements included explained 38.2% of the variation in the non-adopter classification. The model indicated innovations that increased self-image, public image, prestige, and community status all contributed to adoption over non-adoption. Ease of use constructs that negatively contributed to adoption were innovations that were overly simplistic and transparent.

Recommendations

Based on the data, focusing on the workplace and communities is the most effective way to transmit information about a new innovation. Leaders in the workplace and communities must be made aware of the new innovations that can improve the lifestyle of the individual (Nin et al., 2003). The communication should be made in a clear and concise manner in order for the adoption process to be enhanced (Moriba et al., 2011). Once the leaders have chosen to test a new innovation, the innovation should be made readily available for farmers to evaluate the innovation for a reasonable trial period (Rogers, 2003).

References


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Involving Agriculture Faculty in Study Abroad: A Descriptive and Comparative Analysis of Faculty Involvement in and Perceptions of Study Abroad Programs

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Introduction
Increasing student participation in study abroad (SA) programs has become adopted widely into the mission and strategic plans of higher education institutions (ACE, 2012). While the behaviors and attitudes of university faculty have been found to influence student SA participation (Lukosius & Festervand, 2013; Paus & Robinson, 2008; O’Hara, 2009), research conducted to examine faculty SA involvement remains limited. Wade and Demb’s (2009) Faculty Engagement Model was modified by the researcher via a review of literature to provide a comprehensive framework for examining faculty SA involvement (XXX, date).

Purpose/Objectives
The purpose of this study was to better understand agriculture teaching faculty SA involvement. The guiding objectives were to (a) describe agriculture teaching faculty on their SA involvement, perceptions, and knowledge and (b) compare select personal, professional, and institutional factors to agriculture teaching faculty SA involvement, perceptions, and knowledge.

Methods
The population consisted of all faculty in the [University A] (N=173) and [University B] (N=388) who held a formal teaching appointment (N=561). Due to frame error, 63 faculty were removed, yielding a revised sample of 498. Responses were collected from 184 faculty for a 37% response rate. A faculty listserv was obtained from college administrators and used to distribute an online questionnaire. A modified approach to Dillman, Smyth and Christians (2009) Tailored Design Method was used to collect responses from faculty. An original instrument was developed for this study.

Results
The overall mean for involvement was 4.60 (SD=3.17). The involvement items reported by the highest number of faculty participants was I have encouraged students I teach to study abroad. The overall mean for KSA outcome agreement was 4.94 (SD=.80). All KSA outcome agreement items fell within the limits of Agree, with the highest item being studying abroad better prepares students for international careers. The overall mean for KSA outcome importance was 5.17 (SD=.76). The highest rated KSA outcome item was thinking critically to solve problems in diverse setting is important for professionals in my field, which fell within the limits of Agree strongly. The overall mean for SA awareness was 3.93 (SD=1.13). The highest rated item was I am aware of study abroad opportunities relevant to my students. All were within the limits of Agree slightly. The overall mean of SA priority was 3.93 (SD=1.06), which was within the limits of Agree slightly. Faculty agreed most with increasing student participation in study is an institutional priority of my university. The overall mean for prior international experience (PIE)
was 6.88 (SD=2.59). The international experience reported by most was I have interacted with international students, international faculty members, and/or visiting scholars at my university. Multiple one-way ANOVAs were used to compare faculty by institution, tenure status, professional rank, gender, and ethnicity on their SA involvement, KSA agreement, KSA importance, SA awareness, SA priority, and PIE. The only significant differences found were institutional affiliation and PIE, tenure status and PIE, professional rank and PIE, and gender and KSA importance.

**Conclusions/Recommendation**

Faculty were minimally involved in SA activities. The activities in which more faculty were involved included means of encouragement. As faculty encouragement has been identified in past studies as a positive influence on student SA participation (O’ Hara, 2009; Paus & Robinson, 2008), future research should examine why faculty do/do not encourage students they teach and/or advise to study abroad. Less than half of the faculty had conducted any of the other SA activities. Faculty agreed studying abroad produces KSA outcomes among students and agreed strongly these outcomes were important for professionals in their field. Comparison of these findings suggest faculty perceived KSA outcomes as important, but were less convinced that studying abroad produces said outcomes. Faculty perceived increasing student SA participation as a greater priority at the university and college levels than the departmental level. Comparisons based on academic department were not conducted in this study due to a limitation of the survey instrument. As such, this study should be replicated to include academic department as a variable. [University B] faculty had more PIE than [University A] faculty, but no other differences were observed by institution. Similarly, tenured faculty and full professors had more PIE than other participating faculty. The only other significant difference observed was importance of KSA outcomes based on gender. Female faculty perceived KSA outcomes as more important for professionals in their field than did male faculty. Per the review of literature, the lack of faculty differences by institution was surprising. Future research conducted with faculty from additional universities is needed to better examine the influence of institutional factors on faculty SA involvement and perceptions.

**References**


Involving Agriculture Faculty in Study Abroad: An Examination of Faculty Perceptions, Awareness, Interest and Experience as Personal Dimension Variables in Involvement

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Introduction
As part of the initiative to produce globally competent graduates, many higher education institutions have directed efforts to the development and promotion of study abroad (SA) programs (ACE, 2012). As faculty can influence significantly student participation in SA programs, examination of faculty SA involvement is warranted. While involvement has been defined in prior studies as faculty participation in leading an SA program, faculty involvement is needed in additional SA activities such disseminating program information, encouraging participation, and assisting students with the process (Lukosius & Festervand, 2013; O’Hara, 2009; Umbach & Wawrzynski, 2005). A comprehensive approach to examining faculty SA involvement and factors influencing their involvement is needed. The Faculty Engagement Model (Wade & Demb, 2009) was modified through a review of literature to provide a conceptual framework for examining personal level factors influencing faculty SA involvement (XXX, date).

Purpose/Objectives
The study’s purpose was to examine personal dimension factors influencing agriculture faculty SA involvement. The objectives were to describe personal factors of faculty and develop a model to explain faculty SA involvement.

Methods
All faculty who held a teaching appointment in the [University A] (N=173) and [University B] (N=388) were included in the study (N=561). Sixty-three faculty were removed due to frame error, yielding a sample of 498. One hundred eighty-four faculty responded for a 37% response rate. College administrators provided a listserv that was used to distribute an online questionnaire. Responses were collected using a modified Tailored Design Method (Dillman, Smyth & Christians, 2009). An original instrument was developed by the researcher. Data were described using means and standard deviations. Structural equation modeling was used to examine relationships between variables.

Findings
Faculty agreed studying abroad was important overall for students (M=5.17; SD=.86), as well as agreed studying abroad produced KSA outcomes (M=4.94; SD=.80) and that those outcomes were important (M=5.17; SD=.76). Faculty only agreed slightly that they were aware of SA opportunities and associated elements (M=3.93; SD=1.13). Faculty reported minimal involvement in SA activities (M=4.60; SD=3.17), and low but possible interest in leading an SA program (M=2.71; SD = .94). Lastly, faculty indicated they had prior international experiences (PIE; M=6.88; SD=2.59; Range=1-12). Comparison of a null model, two hypothesized models,
and two exploratory models revealed an exploratory, partial mediation model as the best fit (X²=738.53; df=270; RMSEA=.091; CFI=.851; TLI=.834; SRMR=.083). Faculty SA awareness had a direct effect on faculty SA involvement. The effect of faculty KSA outcome agreement on SA involvement was partially mediated by KSA outcome importance and overall importance of studying abroad. Lastly, KSA outcome importance was moderated by PIE.

Conclusions/Recommendations

Personal factors that predicted faculty SA involvement include KSA agreement, KSA importance, overall importance of studying abroad, SA awareness, and PIE. The effect of faculty KSA agreement on SA involvement was partially mediated by KSA importance and overall importance of studying abroad. As indicated by the relationships observed in this model, faculty who believe studying abroad produces KSA outcomes will perceive studying abroad as more important overall and be more likely to be involved if they also believe those KSA outcomes are important for professionals in their field. Consistent with prior research, the findings of this study support the notion that convincing faculty of the value of SA programs can influence positively their involvement in efforts to increase student participation in such programs (Green & Olsen, 2003; Paus & Robinson, 2008). Future research should examine why faculty do/do not perceive select KSAs as outcomes of SA programs and why faculty do/do not perceive select KSAs as important. Additionally, as faculty SA awareness had a direct effect on their involvement, future practice should include informational sessions or seminars to inform faculty of upcoming SA programs within their department and communicate to faculty how those programs can benefit their students. Faculty perception of KSA importance was moderated by PIE. Consistent with prior research, faculty in this study were more likely to perceive KSA outcomes as more important for professionals in their field if they had acquired international experiences themselves (Hulstrand, 2009; O’Hara, 2009; SRI, 2002). Thus, future efforts should include providing faculty opportunities to gain international experiences. Qualitative inquiry to explore how specific international experiences have impacted faculty beliefs toward SA programs could aid in developing such opportunities for faculty.

References


Older Ghanaian Adults’ Perceptions of Physical Activity: An Exploratory Study

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Introduction
Ghana is experiencing an epidemiologic shift in public health issues; the incidence of non-communicable diseases is on the rise, with an increase in stroke, heart disease, overweight, and obesity (Ministry of Health, 2009; World Health Organization, 2015). Physical activity rates have decreased, coinciding with urbanization and an increase in sedentary work (Minicuci et al., 2014). Older adults, women, and those living in urban areas are less active than their counterparts (World Health Organization, 2015). Community-based physical activity programs are a recommended method of increasing activity levels to address these health disparities; however, none currently exist in Ghana (Balis, Strayer, Ramalingam, Wilson, & Harden). Extension has previously been an underutilized resource for addressing physical activity programming. With the inclusion of “physical activity” in the 2014 Farm Bill (U.S. Department of Agriculture, 2015) and NIFA strategic plan (U.S. Department of Agriculture NIFA, 2015), Extension is now positioned to target physical activity to address chronic disease prevention. In addition, U.S.-based Extension professionals are positioned to partner with Extension professionals in developing countries to promote physical activity, as this work aligns with the National Initiative to Internationalize Extension’s international health focus area (U.S. Department of Agriculture, n.d.).

Purpose
The aim of this exploratory study was to determine older Ghanaian adults’ perceptions of physical activity and assess fit and feasibility of adapting and delivering an older adult physical activity program in Ghana. The results of the project will be used to a) adapt an evidence-based intervention for this population and setting, and b) implement and evaluate the resultant program in Ghana.

Methods
Through a concurrent mixed-methods design (Creswell & Plano Clark, 2011), data were gathered from Ghanaian older adults (≥50 years of age) through a survey and focus groups (N=10) conducted at churches and a diabetes clinic in three urban areas: Accra, Cape Coast, and Koforidua. Participants (N=123) were recruited through word of mouth and announcements in churches. Survey items assessed demographic variables, health rating, knowledge of physical activity guidelines, and physical activity levels and self-efficacy. The semi-structured focus group questions related to perceptions were based on the Theory of Planned Behavior (Ajzen, 1991); questions related to program fit and feasibility included physical activity program characteristics (e.g. delivery agents and methods, program contents). Focus groups were planned, coordinated, moderated, and interpreted in partnership with Ghanaian research partners.
Results
Participants who completed surveys (N=121) had a mean (±SD) age of 62.74 (±7.74) years, were predominantly Akan (71%), married (71%), college educated (42%), and currently working (42%). Forty eight percent of participants self-reported that they were “somewhat” healthy compared to others their age. While 43% were able to correctly identify what the physical activity recommendations are, only 51% reported that they are meeting recommendations. Seventy-two percent were not confident that they could meet recommendations. Preliminary focus group results show that participants have positive perceptions of physical activity benefits (e.g. heart health, strength) and guidelines. They were previously unaware of the Ministry of Health’s (MOH) physical activity guidelines and desired more education on the recommendations, indicating need for an educational campaign to complement the physical activity program. Participants’ primary forms of physical activity were daily chores, walking, and dancing. They expressed interest in a community-based physical activity program, with a preference for group-based activities. For example, “If you are able to join a group, you would not sit when they are going to exercise, there is always someone to remind you to come along.” Participants also indicated that they would feel comfortable delivering this type of physical activity program after going through it themselves, supporting a potential train-the-trainer model.

Application
From this mixed methods study, it is evidence that there is a disconnect between physical activity education and behaviors as well as a lack of structured exercises, specifically, a lack of strength training. Therefore, to help older adults from Ghana meet the MOH recommendations, a group-based strength training program will be adapted to meet the cultural values of this population. In order to speed translation, an integrated research-practice partnership approach will be employed. This approach can improve the translation of research to practice through including community-level decision making and partnering with those who will deliver the intervention (Chambers & Azrin, 2013, Chambers & Norton, 2016). This exploratory study and the resultant work is expected to have an impact on the field of international physical activity promotion through using a research-practice partnership approach to adapt, implement, and evaluate a community-based physical activity program in a developing country.

References


Outdoor Childhood Play and the Nature of its Impact: A Case Study

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Introduction
Play is described as, “the basis of all art, games, books, sports, movies, fashion, fun and wonder; in short, the basis of what we think of a civilization” (Brown & Vaughn, 2009, p. 11-12). According to the American Academy of Pediatrics, “play allows children to use their creativity while developing their imagination, dexterity, and physical, cognitive, and emotional strength. It is through play that children at a very early age engage and interact in the world around them” (Ginsburg, 2007, p. 183). Play provides opportunities for youth to explore new avenues in education and creativity as well as develop necessary life skills needed for adulthood (Ginsburg, 2007).

Through positive youth development organizations, youth are given opportunities for play through events such as summer camp, conferences and environmental education programming. At these events youth participate in playful activities such as hiking, canoeing, swimming, archery, zip lining, ropes courses, dancing, group educational games and team sports. These activities provide opportunities for youth to develop competence, confidence, character, a caring attitude and a sense of connectivity to other youth and to positive role models (Lerner & Lerner, 2013, p. 3).

Childhood play has changed overtime; while past generations spent a majority of their play time outdoors. In 2004 Juster, Ono, and Stafford found that youth spent much more time indoors (up 50%) than they did twenty years before (2004). A 2015, study reported in Pediatrics found that children are not given enough opportunities for active play (Tandon, Saelens, & Christakis, 2015). Tandon et al. (2015) found that youth in the centers they conducted research were more likely to actively participate in play when outdoors. Despite the changes occurring in childhood play it is important for children to maintain a positive connection with the outdoors for the vast physical, mental, and social benefits that can occur while participating in outdoor play (Clements, 2004; Holick, 2005; Kuo & Taylor, 2004; Munoz, 2009; Pretty, Peacock, Hine, Sellens, South, & Griffin, 2007).

Purpose and objectives
The purpose is to analyze key components of outdoor experiences, describe youth perceptions of outdoor play and identify the effects of outdoor play on youth development programming. It also seeks to provide data to support recommendations to youth development organizations to increase, enhance, and continue to provide opportunities for outdoor play during activities and events targeting youth.
The research objective of this study is to identify participant attitudes surrounding cognitive, social, behavioral, and emotional experiences during [state] 4-H programming occurring outdoors.

**Methods**

[State] 4-H participants of 2016 Summer Art Camp were engaged in an exploratory, participatory, qualitative research method called Photovoice (Wang, 2006; Wang & Burris, 1997). During camp, participants took photographs that best represented their idea of playing outdoors, created posters with their photographs, and explained the meaning of their posters. The campers also participated in a semi-structured interview that included the following questions.

**Results and Conclusions**

From the overall resulting themes of Belonging, Awareness of Nature and Being Active Outdoors, the following conclusions were proposed:
1. The effects of being outdoors, participating in the act of play, provides a desired sense of belonging.
2. Participants identify opportunities to participate in outdoor activities as important to them and encourages them to be more active.
3. Youth development programs have the opportunity to design programs including outdoor play that can provide youth with positive mental and physical health benefits.

The findings from this study are parallel to that of existing literature and support of the theory of Positive Youth Development’s (PYD) five ‘C's,’ specifically the one representing “connection,” associated with the theme belonging, which took a central role throughout this study.

**Recommendations**

While these recommendations are specific to [State] 4-H, they aim to provide positive outcomes surrounding overall youth development programs, and they can be adapted to all youth development and recreation organizations. Particular attention should be placed on program and activity development that allow for more opportunities for implementation of outdoor play. It is important for 4-H professionals to investigate the possibility of moving current activities that occur indoors to an outdoor setting. To increase opportunities of outdoor play youth development professionals need direction on how to implement outdoor play into basic programs and activities. To do this, a task-force of youth development professionals should create a manual that shows the positive outcomes of outdoor play along with ideas on how to effectively implement outdoor play into each program. Future exploratory studies surrounding outdoor play are needed to truly determine the relationship between outdoor play and youth development organizations. A larger population and research participants are needed to venture a large scale generalization.

**References**


Preparedness of Extension Advisory Services to Support Women Involved in Agricultural Entrepreneurship: A Study in Three Caribbean Islands

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Introduction

Agricultural Extension Services (AES) have been evolving and is seen as having the potential to perform critical roles including intermediation and facilitation among different service providers, farmers, researchers, policy makers and market actors (Davis and Rasheed, 2014). Extension workers have an important role to play in supporting entrepreneurial learning among farmers and agri-entrepreneurs (Kahan, 2012).

Quisumbing et al., (2014) stated that women and men become entrepreneurs for varying reasons. Moreover, female owned businesses have distinctive gender barriers, in relation to entrepreneurial development. German Society for International Cooperation (GIZ) emphasized that engaging extension in a gender sensitive manner allows for recognition of gender differences in approaches since “extensionists are often not sufficiently aware of or trained in gender issues” (GIZ, 2012, p. 2). Should the delivery of extension services be structured to pay attention to the varying needs of men and women?

Purpose

This study which is part of a wider study, determined the extent of consideration given by the extension services of selected Caribbean islands to factors identified as important in enhancing an enabling environment for women entrepreneurs.

Methodology

The study surveyed fifty-two (n=52) frontline extension officers from three islands; Grenada (n=16), St. Vincent (n = 16) and St. Lucia (n = 20).

This paper reports on responses of one section of a wider study; advisory services as a support system, adopted from the African Development Bank (AfDB) and the International Labour Organization (ILO) Integrated Framework Assessment Guide for Assessing the Enabling Environment for women Entrepreneurs. Respondents rated ten questions on a 4-point scale, the extent of consideration given to listed factors. SPSS version 24 was used for descriptive analysis. The survey instrument was reviewed and evaluated for content validity by experts from The University of the West Indies and internal consistency for the consideration measure was calculated (Cronbach alpha) to be 0.84. The instrument was pretested in one island.

Results

The extension officers included 48.1% male (n = 25) and 51.9% female (n = 27). Fifty-percent (n = 26), in the mid-age 31-40 and serving for >10 years (59.7%). Some 30.8% (n = 16) indicated that AES considered utilizing a demographic profile of women entrepreneurs for training
purposes to a medium extent, while 26.9% (n=14) stated that this is not considered. Approximately thirty-eight percent (n = 20) believed that AES considered playing a role in entrepreneurial development for women to a medium extent while 30.8% (n = 16) indicated to limited extent. A small amount (9.6%) stated this is considered to a great extent.

Fifty-percent of the respondents indicated that providing a dedicated business support system for women entrepreneurs is not considered by AES. More than half of the respondents stated that AES considered providing technical resource personnel in entrepreneurial development to a medium extent (38.5% (n= 20) or to a limited extent (36.5% (n = 19). Only 11.5% (n = 6) believed that extension considered having specialist training in agri-entrepreneurship development to a great extent, some 44.2% (n =23) believed that this is considered to a limited extent. About sixty-five percent stated that AES considered specifically targeting women entrepreneurs to a limited extent (46.2%, n = 23) or not at all (19.2%, n = 10). Some 30.8% (n =16) stated that limited consideration was given to development training in gender analysis for staff, while 19.2% believes that this is not considered at all. Another 32.7% (n = 17) indicated limited consideration given to differences that exists in the experiences of men and women in accessing resources to start a business, while 21.2% (n = 11) indicated it is not considered. Some 53.8% (n = 28) highlighted they never had training in entrepreneurship or business development and 46.2% stated they received some form of training.

**Recommendation/educational importance**

The results highlighted that many of the factors critical to providing an enabling environment for women in entrepreneurship are considered either to a limited extent or not at all. These results indicate the following should be considered: (i) Gender sensitive business training opportunities for extension staff, (ii) Capacity building programmes to mobilize and strengthen existing women’s entrepreneurship groups and associations, and (iii) A dedicated business support system for women agri-entrepreneurs (help desk/small and medium enterprise development services). Facilitating on going workshops and seminars with specially trained personnel in business development and training for extension staff in gender analysis planning to contribute to reversing the low support given to women in entrepreneurship. Facilitation of business gender sensitive business training for women agri-entrepreneurs.

**References**


Promoting a Mandela Washington Fellowship Institute: One University’s Experience with Social Media

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Introduction/Conceptual Framework
An effective social media strategy can define an organization’s success in the digital age. During a 2017 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 17 Sub-Saharan African (SSA) countries and to stimulate ongoing collaborations with U.S. businesses and the University community. About two-thirds of the 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 Fellows were among 1000 from SSA dispersed among 40 Institutes and chosen from 64,000+ applicants. The Institute used social media to promote its participants and their 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 groups.

Purpose/Objective
The study sought to assess Oklahoma State University’s efforts in using social media to promote the MWFI it hosted in 2017

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 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 on their activities.

Fellow Fridays were generated to create personal interest in the Fellows themselves and allow followers to identify and place a story with a name and a face. As the most popular type of post, 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 introduce 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, Canabate, 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 trying to share. We analyzed the sharing of the MWFI’s posts depending on type, as based on their content.

Results/Conclusions

By using Facebook’s metrics such as people reached, countries reached, shares, like, comments, and counting those who inquired by private message, the performance of each post type was analyzed. Our best performing individual post with 28,536 people reached, 148 reactions (likes), and 98 shares was an achievement post. Its successful promotion relied on tagging the respective Fellow and sharing by his personal network. However, the second best performing post with 27,049 people reached, 315 reactions (likes), and 17 shares was a biography post, as were the next four best performing posts. The Fellows’ biography posts – which performed best as a group – also relied on their social media networks for widespread sharing. The event and experience posts were not shared as much as others. The highest performing post of this type reached 3,192 people.

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 – biography posts. To improve the sharing of an Institute’s event and experience posts, audiences should be more targeted, i.e., with special relationship(s) to each (Kietzmann et al., 2011). Finally, Institutes should budget for qualified staff who can effectively establish and maintain their social media platforms (Kietzmann et al., 2011).

References

Rebuilding Agricultural Extension Service in Conflict Affected Countries After Ending a Civil War: Lessons Learned in Sri Lanka and Liberia

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Introduction
After ending a war, rebuilding the agricultural extension service in a war-torn country is critical for its reconstruction effort (Betru & Long, 1996; Verkoren & Junne, 2012), because the re-activation of production, jobs and basic services for the population at large is essential to establish lasting peace (Castillo, 2012). In some war-torn countries like Liberia, the agricultural extension service had been completely destroyed by the end of the civil war. In some countries like Sri Lanka, extension had been partially destroyed. If the agricultural extension service is rebuilt soon after ending the war, it can be used to expedite the reconstruction process.

Purpose and Objectives
The purpose of this paper is to examine the rebuilding process of agricultural extension concentrating on the needs of reconstruction efforts of war-torn countries.

Methods
This paper is based on the author’s observations of reconstruction efforts in Liberia and Sri Lanka after ending their civil wars and related literature.

Products, Conclusions, and Recommendations
If we want to expedite the reconstruction process of a war-torn country, it is necessary to rebuild the agricultural extension service and direct it to support reconstruction. The rebuilding process of agricultural extension in a war-torn country includes three major tasks: 1) building infrastructure, 2) building human resources, and 3) development of programs.

Building Infrastructure
Building infrastructure includes construction and renovation of damaged office buildings, training centers, communication facilities, equipment, and transportation facilities. Seeking financial support from international donor agencies is an option to accomplish this.

Building Human Resource
Building human resource of the extension service includes recruitment, training, and placement of qualified individuals for various extension positions. Finding qualified persons for various extension positions is a challenge due to destruction of educational system for years (Salmon & Piza-Lopez, 2010). Therefore, extension has to start with available people who can do the job. First, national level key personnel should be recruited. Next, regional level officers should be recruited. Finally, regional level officers should be directed to recruit suitable extension workers to serve at the local level. Paying due attention to recruit appropriate local level extension workers is important to facilitate the community reconciliation process. Civil wars are mainly due to mistrust between warring parties. Therefore, local level extension workers should be selected to represent the community they serve and speak the same language. It is important to plan and implement an induction training to help recruited extension workers to gain
necessary knowledge and skills to support country’s reconstruction effort. After training, field extension workers should be placed to serve in communities. A line of command and supervisory mechanism should be organized to provide necessary guidance and in-service training to local extension workers.

**Development of Programs**

Extension program development can be reviewed under four frames of reference to provide necessary support for the reconstruction effort: 1) community development, 2) farmer development, 3) market and value chain development, and 4) community resiliency and peace building. The relative significance of the frame of reference varies with the time since resettlement of displaced people. Soon after resettlement, extension work should be focused on community development to coordinate services necessary for resettling communities. At this stage, communities do not have organized services such as agriculture input markets, credit, health service, etc. Extension programs should coordinate with relevant agencies to bring these services to communities at this stage to help communities begin their livelihood. After community development is taking off, it is important to focus extension programming on farmer development to equip farmers with necessary knowledge and skills to operate their farms. Initial farmer education programs should be focused on building farmers’ capacity to prevent farm hazards, minimize crop failures, and maximize farming outcomes. Next, it is important to develop output markets and value chains for agricultural commodities. Extension should lead the value chain development with relevant businesses and organizations to coordinate the process. Organizing farmers to form commodity groups and value added cooperatives is an option for value chain development. Extension programs also should be focused on sustaining agricultural development and peace. This can be achieved by focusing extension programs on conservation, leadership development, and civic engagement. Establishment of local extension advisory councils with the representation of all communities in the area is important for directing extension programs to meet community needs.

The major implication of this paper is that it provides a guideline for rebuilding an agricultural extension service in a war-torn country and direct it to facilitate the reconstruction process.

**References**


Reflections of International Participants on Their Agricultural Training in the United States: Lessons Learned

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Introduction/Theoretical Framework/Review of the Literature
Lack of international cooperation is considered one of the major challenges to overcome in achieving global agricultural development (Acker, 1999). Goal 17 of the United Nations’ Sustainable Development Goals (2015) is to “revitalize the global partnership for sustainable development” and the UN notes that success in sustainable development requires collaboration between government, private sector, and the civil society. In efforts to increase agricultural development, the [Program Name] of the [College Name] at [University Name] offers customized agricultural training programs for professionals all over the world from the private sector and the public sector.

Many of these training programs are funded through the USDA-FAS Cochran Fellowship Program, which brings “agricultural professionals from middle-income countries, emerging markets, and emerging democracies…to help eligible countries develop agricultural systems necessary to meet the food and fiber needs of their domestic populations (Cochran website, n.d.).” These two-week international trainings are educational programs comprised of experiential learning activities through field trips and site visits, as well as lectures with professionals throughout the university, the state agricultural department, and the federal agricultural department. As Roberts and Jones (2009) mentioned, a participant’s international experience can be prolonged through reflection, as it keeps the participant’s attention on the experience. With these international trainings, participants were asked to reflect on their experiences before, during, and after the training for practical applications.

Purpose and Objectives
The purpose of this study was to determine the international participants’ learning experiences during their agricultural training in the US. The findings will provide valuable insight for planning and facilitation of future international agricultural trainings. The specific research objectives were to explore: the participants’ perceptions on the training’s relevance to their work; knowledge and experience gained; how it will impact their country; what they plan to do with learned experience; barriers they will face in implementation; and how they can overcome those barriers. Another objective of this study was to explore if government-based participants and private-sector participants shared similar or differing responses.

Methods and/or Data Sources
Reflections were conducted with participants of five international agricultural training groups from Ghana, Jordan, Bosnia, Senegal and Mali, and China in 2017. At the end of their training program, each participant completed a written questionnaire comprised of open-ended reflective questions. These reflections related back to a prereflection activity completed by the participants at the start of the training for determining their professional growth. The reflective responses were
analyzed by a coding process and were broken down into themes and subthemes to help make meaning of the data (Merriam, 2009). During analysis, responses from government-based participants were compared with private sector-based participants to see if any differences arose between these two types of participants.

**Results, Products, and/or Conclusions; Recommendations, Educational Importance, Implications, and/or Application**

This presentation will discuss the participants’ experiences, expectations, and ways to improve future international agricultural training programs. This presentation will also discuss the differences between government participants and private-industry participants in the barriers they predict they will face in their home country in efforts to implement what they learned during their training and the differences in how they feel they can overcome these barriers. For future international agricultural trainings, the results from this research will provide recommendations for the selection of program participants from public and private sector with efforts to make the most positive change in agricultural development efforts in their home countries.

**References**


Retrospective pre-test evaluation in an international agricultural education context

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Introduction
Researchers have long sought rigorous and accurate means of program evaluation (Colosi & Dunifon, 2006). The most common form of programmatic evaluation is pre-/post-test design (Colosi & Dunifon, 2006). International agricultural and extension educators commonly use pre-/post-test design, particularly where assessing change is a priority. A cursory search (since 2000) of the literature revealed eight articles or abstracts published in the Journal of International Agricultural and Extension Education using this design (Annor-Frempong, Zinnah, & Adam, 2003; Boz & Verma, 2001; Cai, Rodriguez, & Abbott, 2014; Fabregas, Kelsey, & Robinson, 2011; Poma, 2000; Snyder, Mickelbart, & Eylands, 2012; Wingenbach, Boyd, Lindner, Dick, Arispe, & Haba, 2003; Raju, 2005).

Pre-/post-test design is useful for assessing change, but is susceptible to threats to internal validity (Colosi & Dunifon, 2006), namely response shift bias (Howard, 1979); participants’ tendencies to be influenced by new understanding during the intervention, shifting their perspectives, and rendering the pretest measurement invalid or inaccurate (Klatt & Taylor-Powell, 2005).

Howard (1980) identified a potential solution to remedy response shift bias: the retrospective pre-test. Colosi and Dunifon (2006) described the retrospective pre-test, or the post-then-pre design, that implements one measurement after an intervention. The solitary measurement requires participants to self-report their competency levels for a phenomenon from before, and after the intervention (in one survey), thereby minimizing the likelihood of response shift bias, testing fatigue, and potential costs of multiple collections.

Despite potential benefits to validity, accuracy, and rigor, and successes in other extension contexts (Davis, 2002), the international extension and agricultural community has not adopted widely the retrospective pre-test design. There is need to investigate the usefulness and accuracy of such a design in the international agricultural and extension context.

Purpose and objectives
The purpose was to investigate potential response-shift bias in pre-test/post-test and retrospective pre-test designs in international agricultural and extension education programs. We used two objectives: 1) Compare pre-test scores from pre-test/post-test and retrospective pre-designs, and 2) Compare post-test scores from pre-test/ post-test and retrospective pre-test designs.

Methods
The population in this study was purposively sampled. Researchers identified a program where programmatic evaluation used a questionnaire to measure pre- and post-experience (i.e.,
agricultural study abroad program in Namibia) responses. Researchers evaluated participants’ soft-skill development, using the Global Skills Inventory (GSI), for two years. In 2016, a pre-/post-test design was used. In 2017, a retrospective pre-test design was used. We had 36 participants; 15 evaluated by pre-/post-test design, and 21 by retrospective pre-test. The same field experiences, assignments, activities, and program leaders were used annually.

Findings
Significant differences existed in pre-test scores between Namibia 2016 (pre-/post-test) and Namibia 2017 (retrospective pre-test) for three constructs: Global perspective (p=.04), resource management (p=.01), and psychological health (p=.04). Participants who were evaluated in the pre-/post-test design reported higher mean scores in pre-test measures for each construct than did participants evaluated with a retrospective pre-test.

Only one construct (psychological health: p=.002) yielded statistically significant differences between Namibia 2016 and Namibia 2017 participants in post-test scores. Participants in 2017 reported a higher mean score in psychological health than did 2016 participants.

Conclusions and recommendations
Since participants reported significantly higher scores on pre-test measures in three constructs on the GSI, despite consistent intervention conditions, we concluded there was potential response shift bias in the 2016 Namibia program. This finding supports previous research on pre-/post-test design (Howard, 1979; Howard, 1980; Klatt & Taylor-Powell, 2005).

Retrospective pre-test design yielded similar post-experience data as in the pre-/post-test design in four of five constructs, including all but one of the constructs that showed evidence of response shift bias. International agricultural and extension programmatic evaluations using retrospective pre-test designs return similar results to the commonly used, though problematic, pre-/post-test design. This supports Davis’ (2002) assertion that retrospective pre-test design is not only valid and reliable, but meaningful in extension settings.

We recommend using a retrospective pre-test design to measure self-reported changes in international and agricultural extension education programs.

References


Introduction/Theoretical Framework

Institutions of higher education have a responsibility to provide undergraduate students with knowledge and exposure to experiences necessary for success in America’s society (Coers, Williams, & Duncan, 2010) and the ever-evolving workplace (Cassidy, 2006). To prepare students for the 21st century workplace colleges and universities are moving beyond the traditional lectures and are placing more emphasis on experiential learning opportunities for undergraduate and graduate students. A specific example of a guided experiential learning opportunity is a local and/or global service-learning program that provides practical experience for students unskilled in and/or unaware of a given profession or crisis (Moore, 2017).

This study was organized around two theoretical frameworks – the first being critical thinking as defined and explored by Peter Facione; the second is the Transformational Learning Theory model developed by Mezirow (1991). Facione’s (1990) definition of critical thinking states that “we understand critical thinking to be purposeful, self-regulatory judgment, which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based” (p. 2). The Transformational Learning theory developed by Jack Mezirow (1991) builds on the foundation of earlier work by John Dewey and David Kolb – both of which emphasize the critical importance of reflecting on one’s experiences in specific stages and tailoring the learning experience to meet the needs and desires of the learner and the community they are serving.

Purpose and Objectives

The purpose of this study was to examine the impact of a service learning study abroad program to Scotland had on students personal, cultural, and educational learning. This study was supported by the following research question:

• What impact does study abroad have on students’ learning within the personal, cultural, and educational domains?

Methods

This study employed a qualitative data collection approach through the use of reflective journals, observations throughout the trip, and researcher notes from the group reflection experiences. Students (N = 20) were asked to participate in two different reflections each night; a personal reflection and a group reflection. Group reflections were guided by a different student pair each evening, following the example of the instructors on the first night. During the group reflections, the researchers would note different topics that were expressed by the students. These topics were used to assist in the analysis of the students’ individual reflection journals. The individual reflection journals were analyzed using the Constant Comparative Method by Lincoln and Guba.
Trustworthiness and Rigor were upheld through the use of triangulation, member checking, saturation, and methodological journals.

**Results/Conclusions**

From the data the following themes emerged:

- Cultural Learning
- Concern for the Environment

Cultural Learning occurred in a variety of ways through the experiences provided at local primary schools, or through personal interactions with college students from the [UNIVERSITY]. Students realized through their experiences that there were many cultural differences and similarities between the United States and Scotland. S-12 stated in her description of her first day in Scotland, “the folks causally drinking alcohol on the train was different … I knew they drank in pubs but I didn’t know they drank everywhere else too.” P-15 shared, “today I saw how it [organic farming] used literally everywhere in Scotland and it works for them. However, for me I don’t see it being practical in the US because of the large number of people and the need to feed the world.”

Concern for the environment was a huge development for all of the students on the trip. In many cases, students had never realized the large impact their actions had on the health and well being of the environment around them. Student 10 shared, “today’s activities have inspired me to think of more natural sustainable ways of doing things and definitely made me more aware of my carbon footprint. In my future, I would like to be more aware of how I am effecting the environment on a daily basis.”

Therefore, a need exists for universities to encourage more students to engage in experiential learning opportunities, such as study abroad programs. More specifically, faculty should work to engage more students in service learning study abroad programs to allow students to have a lasting impact on the people and country they visited. This program specifically had a strong emphasis on food insecurity, which led to students thinking about the content to change and emerge.

**Recommendations**

The researchers recommend that further examination of service learning study abroad programs be conducted to better understand the impact these activities have on students’ long-term thoughts and decisions. Further, faculty should do more to encourage students to engage in these experiences to help them broaden their cultural development.

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The CIL Fellows Program – Developing a 21st Century Cohort for Innovation

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Introduction

Innovation is not a new phenomenon. Arguably, it is as old as mankind itself. There seems to be something inherently “human” about the tendency to think about new and better ways of doing things and try them out in practice. Without it the world in which we live would have looked very, very different. (Fagerberg, 2006, p. 1)

Innovative thought is important within any field – it pushes society to continue moving forward and improves the quality of life. What’s more, the synergy that results from the engagement of different perspectives in a cross disciplinary effort can further enhance the flow of innovation. As Fagerberg (2006) asserts, one cannot innovate in isolation but depends on extensive interaction with his or her environment. Innovation has historically played an especially salient role in Extension – but how do we encourage innovation among community members, Extension professionals and graduate students? And can we learn from community leaders outside of the field of Extension?

Purpose & Objectives

The purpose of this presentation is to introduce the Community Innovation Lab (CIL) Fellows program as a community-education program designed to encourage creative and innovative thought that enhances communities of place, interest and practice. More specifically, we will explore the synergy and shared learning that occurs when developing a cohort that includes Extension professionals, community leaders and graduate students.

Methods

The CIL Fellows program is a one-year longitudinal leadership, community-education program designed to support and strengthen community innovators. This hands-on experiential education program offers a unique professional development opportunity for Extension professionals and community leaders to learn and work side-by-side, ultimately building community among participants and leading to cross disciplinary synergy. This program serves as a means to assist in preparing participants with the skills and capacities needed for 21st century citizenship — global awareness, creativity, collaborative problem-solving and self-directed learning (Groff, 2013). Over the course of its monthly meetings, the program not only teaches about innovation, but embodies innovation through the educational process.

Results

Regarding the program’s evaluation, CIL Fellows were surveyed mid-way through the program, and interviewed at the culmination. Reflecting upon this program, participants stated they learned a significant amount, valued the quarterly one-on-one “coaching sessions” and appreciated this unique professional development opportunity. Perhaps the most powerful theme that emerged from the final interviews was that of the feeling of a cross disciplinary cohort – one
with diverse perspectives and ideas that pushed each individual’s sense of innovation and creativity. The interaction between fields – Extension, community and higher education – continuously surfaced as an important component to the overall success of this unique learning environment. Critiques of the program included that participants indicated they wished the sessions were longer, and that they had more regular interaction with their cohort, as well as the time and ability to engage at a deeper level (which was often limited due to work responsibilities).

**Educational Importance & Implications**

During the presentation, we will discuss the successes and challenges of building a cross disciplinary professional development program on innovation, as well as the holistic impact of the program within the local and Extension communities. This program is designed to be replicated for a variety of audiences, including domestic and international audiences. Being a part of the CIL Fellows program, the idea of having only one resident “expert” provide all of the information is put to rest. Ultimately, this makes way for the countless innovations that can result from combining the diverse perspectives, ideas and actions of Extension specialists alongside community leaders and graduate students. This synergy is important, as Franz (2009) asserts that for the engaged scholar, focusing on a reciprocal relationship with a community adds value not only to the community, but also the scholar’s field.

Moreover, social innovation has been identified as an important component of being resilient – new ideas keep a society adaptable, flexible, and able to learn (Moore, Westley, Tjornbo & Holroyd, 2014). Through the CIL Fellows, the participants were able to explore techniques to develop creative and innovative programs, while also increasing their human capital through engaging with new networks. In the long run, the development of a cohort of community innovators can play an essential role in furthering community education, Extension and the overall development of society.

**References**


The Influence of an Agricultural Subsidies Extension Program on Smallholder Maize Farmers in Tanzania

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Introduction
The economy of Tanzania depends heavily on agriculture and is the backbone of its economy (URT, 2014). Agriculture alone provides 85% of the total exports and employs about 80% of the workforce of the rural population (Cochrane & D'Souza, 2015; Juma, 2007; URT, 2014). Those employed in agriculture are mainly smallholder farmers cultivating less than one hectare of land (Cochrane & D'Souza, 2015). To smallholder farmers, farming is a household activity implemented at the subsistence level. The government of Tanzania launched the program as a bridge to shift subsistence farming to farming as a business and to promote food secure households. Food insecurity was associated with low rate of fertilizer application and poor seed quality among smallholder farmers due to fertilizer and seed costs. These conditions were the major reasons for launching the extension subsidy program. This study aimed at assessing the impact of the agricultural subsidies program to smallholder maize farmers.

Purpose and Objectives
The purpose of the study is to assess the impact of an extension agricultural subsidy program on smallholder maize farmers in the Mbeya District Council (primary crop) of Tanzania. The four research objectives were: 1) determine whether agricultural subsidies contribute to the smallholder farmers’ productivity; 2) examine how subsidizing agricultural inputs contribute to farmers’ food security; 3) investigate what role the extension program contributed to post-program usage of improved inputs; and 4) determine farmers’ perceptions on how the program functioned.

Methods
The study employed survey techniques using purposive sampling of 120 smallholder farmers in areas where subsidy programs operated. The investigation involved 60 smallholder farmers who received subsidies and 60 who did not. These farmers were selected from their respective households from four different wards (i.e., 15 smallholder farmers who received subsidies and 15 smallholder farmers who did not). Hence from each ward, 30 smallholder farmers were purposively selected to form the sample used in the study. The study used two interviewer administered questionnaires to collect data from the respondents. One questionnaire was utilized with farmers who received subsidies and the other with those farmers who did not. The survey was conducted by interviewing each head of household or their representative. Questionnaires were given by an interviewer to address issues related to literacy and reduction of missing information.

Results
The first objective examined agricultural productivity for farmers who participated in the subsidy program and those who did not. Paired samples test indicated a statistically significant difference between the number of bags harvested (100 kg) per acre before subsidies (5.35 bags) and number
of bags (100 kg) after subsidies (10.10 bags) for farmers who received subsidies (t=9.06, 
p<.0001). There was not a statistical difference in mean harvest scores (time 1/before – 6.26 bags 
and time 2/after – 7.01 bags) for farmers who did not receive subsidies.

The second objective addressed how agricultural subsidies contributed to famers’ food security. 
Results indicated most farmers agreed that availability of maize stored in their household makes 
them feel secure in terms of food (90.8% of total sample). In addition, 90% of farmers who 
received subsidies believed their food security improved due to their participation in the program.

The third objective explored how the subsidy program contributed to post-program usage of 
improved inputs. Both groups were similar in their use of improved inputs (63.6% participants, 
58.3% non-participants), however more farmers in the program planned to use improved inputs 
than farmers who did not participate (78.3%, 66.6% respectively).

The fourth objective examined how the subsidy program functioned. Results showed that farmers 
reported their agricultural activities general improved (73.3%, n=44) as a result of their program 
participation. Reasons farmers who stated there was not an improvement in agricultural activities 
were: incomplete package of subsidies, delays in distribution of inputs, longer participation in 
program required, and inadequate training on good agronomic practices.

Recommendations and Implications
The subsidy program contributed to the improvement of agricultural activities for smallholder 
maize farmers. Subsidizing the production of maize contributed to food security since most foods 
made of maize were for daily consumption. Despite the contributions of the program, reaching its 
goals can be hampered by not following the guidelines for operation of the subsidy programs. 
Other recommendations include program subsidies should be provided to support crops which 
are farmers’ choice and based on agro-ecological zone, climate, and their preference rather 
dictated by authority. Also there is a need to establish a data base for farmers and area of land 
used for farming to control amount of inputs required and needed by farmers.

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U.S. Extension Professional International Exchange: A Systematic Review of the Literature

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Review of the Literature

Leadership, problem solving, team building, and communication skills are some of the behavioral competencies EPs require to deliver knowledge to help solve community challenges (Crawford, Lang, Fink, Dalton, & Fields, 2011; Hart Research Associates, 2010). Strategies to develop cultural competency and global perspectives have been generated for other groups, like undergraduate students. These approaches include: attending conferences, lectures by those who have lived abroad; participation in online simulations; viewing videos; long-term service such as the Peace Corps; studying abroad; and participating in exchanges (Heinert & Roberts, 2016). Conner, Roberts, and Harder (2003) illuminated the competencies needed by entry-level international agriculture and development professionals who are working abroad. Ebner, Constantinescu, Borlea, Indrea, and Russell (2017) found undergraduate exchange programs can raise awareness of Extension careers and build cultural competency in future EPs. A discourse has begun on preparation of future EPs and how to prepare agriculture professionals holistically for a global emphasis. EPs grow in cultural competency and global perspectives when they participate in international exchange efforts (Rogers, 1993; Smith, 2010). It is essential to prepare undergraduates and mid-career EPs cultural competency and global perspectives as community shifts occur faster than EP turnover.

Purpose and objectives
The purpose of this study is to explore the experiences of U.S. EPs abroad. The authors assessed the status of research on the topic. The objective of the study is to identify: established best-practices of U.S. EP exchange work, benefits EPs reaped, and if costs/benefits manifest for EP communities or in exchange communities.

Methods
A systematic review of the literature was conducted. The parameter of the review was to identify literature from five Extension education journals. All articles published over the last 10 years in the Journal of Agricultural Education (JAE), Journal of Agriculture Education and Extension (JAEE); Journal of Human Sciences and Extension (JHSE); Journal of International Agricultural and Extension Education (JIAEE); and, Journal of Extension (JOE) were reviewed for articles meeting the criterion of the study. Articles needed to pertain to U.S. EPs who had participated in international experiences and who had traveled to a foreign country. Four articles met the criteria, three from JOE and one from JIAEE.
Results

JOE
Treadwell, Lachapelle, and Howe (2013) reported on EP travel to Nicaragua. Their conclusions included: EPs gained professional skills, short-term trips for EPs were recommended, and long-term collaborations from afar should be fostered. Lockett, Moore, and Wingenbach (2014) reported on EPs joining an undergraduate student exchange to Guatemala. They acknowledged an exchange was not the only strategy to develop global awareness. EP participation provided value to the students and the results of service learning projects had benefit to the exchange communities. Stevens, Smith, and Downing (2014) evaluated an exchange of EPs and undergrads to Belize. Results included: an established network in-country benefited the project, EPs professional and cultural skills were developed, and EP participation added value for students.

JIAEE
Place, Vergot, Dragon, and Hightower (2008) evaluated an EP, undergraduate, and stakeholder exchange in Costa Rica. Outcomes found were: participants began working locally and internationally to solve local problems, EPs gained credibility for future international projects, EPs used cultural learning upon return, undergraduates increased awareness of Extension, and learning continued from participants giving talks in their communities upon their return.

Implications
EPs bring their experiences back to their communities (Place et al., 2008). However, these studies of exchanges did not determine if improvements in EP skills has benefited the communities where EPs live, work, or visited. EP participation is inhibited from U.S. local stakeholder concern about EPs diverting efforts abroad (Harder, Lamm, & Vergot, 2010; Stevens et al., 2014; Strong & Harder, 2011). Local government financial stake in EPs provides legitimate claim to question the return on investment for support of global initiatives. EPs can improve their professional skills by participating in exchange programs. Cultural competency was improved by exchange participation. Professional skills like program planning and evaluation were also improved (Lamm & Harder, 2010; Lewis & Gibson, 2008). EP participation benefits undergraduates and exposes them to the career field. Given the documented EP international engagement, we recommend further research to increase participation.

References


Use and Acceptance of Social Media by Agricultural Extension Workers: The Case of Department of Agricultural Extension in Bangladesh

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Introduction and Theoretical Framework
Information and Communication Technologies (ICTs) have been considered as key driving forces for enabling agricultural development—the sector which provides livelihoods of majority of population in Bangladesh. ICT infrastructure as well as adoption is stressed in the ‘Digital Bangladesh’—the political manifesto of the present government. As a consequence, the numbers of ICT users have been rapidly increasing and there are currently 3.3 million social media users in Bangladesh (Internet Society, 2015). Since 2014 the major public sector extension agency i.e. the Department of Agricultural Extension (DAE) has been focusing on use of new ICTs such as, social media by the extension workers so that they can provide better and timely services and be always well-connected to their professional colleagues and clients. As a new tool of online communication, the acceptance of social media by extension workers of DAE for their professional purpose is unknown.

The study was informed by the Technology Acceptance Model (TAM). TAM is a widely used theoretical model for explaining adoption of Information System (IS) (Straub, Keil & Brenner, 1997; Davis, Bagozzi & Warshaw, 1989). Davis (1989) used Theory of Reasoned Action (TRA) as theoretical foundation to develop the TAM Model. According to TAM, Actual Use of IS (AU) is determined by the Behavioural Intention (BI), which is determined by Attitude towards using (A) and Perceived Usefulness (PU). Again Attitude (A) is formed by the Perceived Usefulness (PU) and Perceived Ease of Use (PEoU). In TAM, perceived usefulness (PU) and perceived ease of use (PEoU) are considered as fundamental determinants of information technology acceptance and usage (Davis, Bagozzi & Warshaw, 1989). As per TAM model, hypotheses were developed to determine the acceptance of social media by agricultural extension workers.

Purpose and Objectives
The research was conducted to determine use and acceptance of social media by agricultural extension workers of DAE for their professional purposes.

Methods and Data Sources
In this research, a multistage random sampling was executed. At first Comilla out of fourteen agricultural regions was randomly selected. From a list of 523 social media users among the DAE staff at Comilla region 25% (i.e. 140) respondents were selected as the sample of the study. Data was collected during August to November, 2016 through a questionnaire survey. Descriptive and regression analysis were used to analyse the data.
Results and Conclusion

The highest proportion of agricultural extension worker (36%) used social media for half an hour to one hour every day. PEOU had strong significant positive influence on the PU of social media ($R^2= 0.165$). PEOU had significant and PU had strong significant positive influence on the A towards using social media ($R^2=0.478$). Again, PU and A had strong significant positive influence on the BI to use social media ($R^2= 0.432$). BI had strong significant positive influence on the AU of social media ($R^2= 0.202$). PEOU through its instrumentality and self efficacy functions influenced PU and A. In PEOU, the items that received highest score were “Learning to use social media is easy for me” and “It is easy for me to become skilful at using social media”. PU of social media has increased the job performance of DAE staff. In PU, the items that received highest score were “I can follow the activities of my colleagues on social media” and “Social media provide me opportunities to perform various professional activities”. Social media helped extension workers getting connected and follow the activities of other colleagues and clients. Social media have been used to get updated official instructions, to provide feedback and perform in the field accordingly.

Recommendations, Educational Importance, Implications

The acceptance of social media by agricultural extension workers indicates its potential use for enhancing performance of extension services of DAE. The extension workers’ ease of using social media indicates that they require less effort in learning to use social media and to be skillful in using social media for professional purpose. Therefore, they can use it to reach out larger number of farmers and collaborate with their colleagues effectively with less time. Overall, the findings indicate potential use of social media in an ICT based agricultural development strategy in Bangladesh.

References


Using Public Pedagogy to Train Mexican Project Managers

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Introduction
Keeping your audience in mind is a multilayered process, especially when delivering training to an international audience. Extension education needs to remain culturally relevant to its audience (Alaway & Dale, 1994), which means conducting research on an audience’s culture prior to delivering any leadership training program (Hilburn, 2000). Roberts, Thoron, Barrick and Samy (2008) provide their “lessons learned about conducting workshops in a foreign country” and emphasize educators to “know the potential audience, learn the culture, and understand the local situation” when developing and delivering training (p. 86-87), however an aspect of leadership training they did not provide insight into is the use of public pedagogy and ensuring it remains culturally relevant to the audience.

Pedagogy is the methods in which information is taught (Giroux, 2004). Public pedagogy recognizes informal learning that happens outside the classroom, where audiences, young and old, learn from the media they consume (Wright & Sandlin, 2009). Instead of relying heavily on lectures, instructors need to appeal to the intellectual strengths and styles of their audiences, and should utilize “media and representations that make sense to them” (Veenema & Gardner, 1996, p. 70). Many researchers agree that utilizing popular culture and media expands their students’ worldviews and understanding of those around them. In their study, Williams and McClure (2010) compared three teaching methods, public pedagogy, traditional lecture, and experiential learning, to gauge which method lead to the most content retention. By far, the most knowledge retention was from “students who received their information via public pedagogy” (Williams & McClure, 2010, p. 94).

The question then becomes, how can extension educators make public pedagogy relevant to an international audience, specifically for leadership trainings for Mexican learners? Hispanics have been found to have a preference for nonverbal emotional cues and lean towards a more relational approach to communication (Espinosa, 1995). Uscanga and Edwards (2016) also urged the importance of catering to socio-economic-cultural variables of Mexicans, and to deliver training based on their customs and language.

Methods
In the summer of 2017, 18 professionals enrolled in a certificate program focusing on project management that was delivered in Mexico City, Mexico. These adult learners had varying experience (from one to 35 years) so it became imperative for the instructors to provide experiential activities which allowed application of the material regardless of project management experience.

There are numerous facets an educator must consider when integrating public pedagogy into non-formal leadership training for Mexican participants. One of the most labor intensive components is the study of Mexican culture. Taking time to study the history, popular culture,
current events, individual's level and comfort with technology of the country is the first step in making examples and public pedagogy artifacts relevant to participants. Knowing these demographics allowed the instructors to adapt content in order to give all participants equal ability to apply leadership concepts to the examples.

Integrating the arts into the training was another way public pedagogy was used. In Mexico, the arts are a part of everyday life, and have a close tie to leadership. Therefore, playlists were created to play during breaks and during group work. These playlists included both Spanish and English songs. Numerous participants commented on how the music was beneficial in their learning, and some correlated the songs to the content presented.

Modifying westernized views of leadership to include concepts embraced by Mexican culture is essential in using public pedagogy. Using the GLOBE study (House, et al, 2004) aided the educators in choosing topics and activities to use in the training. Activities used in United States (US) training were modified to include Mexican historical and current leaders as examples.

**Results and Recommendations**

Regardless of experience level, each participant actively participated in the activity and applied concepts taught to their answers. The evaluation of the activity was overwhelmingly positive with many participants specifically citing the use of Mexican companies and leaders as impactful. This supports Uscanga and Edwards (2016) conclusion that when presenting to Mexican audiences, it is imperative to consider customs and language.

There were also many lessons learned. Using public pedagogy is an effective way to train an international audience, but instructors must take the time to understand the culture and audience as activities and methods are developed (Roberts, Thoron, Barrick, & Sammy, 2008). Internationalizing curriculum can be as complicated as making sure examples translate in a different language to using the correct measurement (feet or meters). Public pedagogy is time consuming on the front-end of the training process but reaps many rewards during and after presentation.

**References**


Introduction

“Obtaining a quality education is the foundation to improving people’s lives and sustainable development” (FAO, 2017). Yet, the Ugandan education system places the sole emphasis on students passing the final national examination. This encourages lower-order thinking through rote memorization of content (Mukembo, 2017) rather than equipping students with practical knowledge and skills that would promote application and self-sustainability upon leaving school (Basaza et al., 2010; Lugemwa, 2014; Mukembo, 2017). This is especially concerning with agricultural education, as it is widely believed that rural youth are becoming more disinterested in agriculture (Bennell, 2007). Additionally, “support for capacity development for youth in directly productive agricultural activities (especially skills training at all levels) still receives limited support” (Bennell, 2007).

A study conducted in 2012, Lost Opportunity? Gaps in Youth Policy and Programming in Uganda, stated that 61.6% of Ugandan youth were unemployed (ActionAid International Uganda [AAU], Development Research and Training [DRT], & Uganda National NGO Forum [UNNGOF], 2012). A majority of the study’s participants perceived they did not receive the necessary skills in school to prepare them for the real-world (AAU, DRT, & UNNGOF, 2012). If rural youth are equipped with agricultural skills and become interested in agriculture as an industry, there is great potential for increasing food security in their communities (Bennell, 2007).

Purpose and Objectives

Together Vivayic (learning solutions consulting firm) and Field of Hope (NGO working in Uganda to develop agricultural knowledge among youth and smallholder farmers) created a model of how to equip rural Ugandan youth with practical agricultural skills and build their interest in agricultural careers. The two organizations collaborated to design, write, and pilot a year-long Senior 1 (S1) Introduction to Agriculture curriculum. The design considered two frameworks:

1) the Secondary Level Teaching Syllabus of the Ugandan National Curriculum Development Center (NCDC), which outlined the content topics and objectives for the lesson plans, and
2) a project-based learning (PBL) approach that targets competency development such as problem solving, decision-making, teamwork, communication, risk-taking, and agri-entrepreneurship.

Therefore, the newly developed S1 agriculture curriculum covers the content identified on the national exams while also preparing students to enter careers in the agricultural industry and/or developing the competencies needed to be a successful smallholder farmer. The experiential
nature of the curriculum will solidify concepts in the mind of the learner to promote recall for assessment or application.

**Theoretical/Philosophical Themes**
The PBL approach promotes the development of problem-solving skills, interpersonal communication skills, leadership skills, and teamwork as well as being the catalyst to higher order thinking and reasoning skills (Mukembo, 2017). These professional skills are likely to be retained and used by students later in life. Research suggests traditional teaching methods, such as lecturing may not equip students with these skills (Mukembo, 2017). Furthermore, the PBL design encourages deeper understanding of content and its applicability to real-world scenarios (Mukembo, 2017). Ultimately this may empower students to pursue agriculture as a means to improve their lives, their households, and their communities. PBLs are a foreign concept in most developing countries. The Ugandan education system is classroom-focused. The school farm or gardens are rarely used for learning purposes. In their current paradigm, the school garden is associated with manual labor, and the classroom where learning takes place. It will take a significant paradigm shift to get students (and their teachers) to see the school garden as a laboratory for learning, to engage in experiential learning activities, and access learning objectives beyond rote memorization.

**Results and Conclusions**
Vivayic and Field of Hope piloted lesson plans in two rural Ugandan schools; the pilot included two S1 classrooms in different regions of the country with diverse instructors (a Ugandan male teacher and a western female teacher). Qualitative data was collected from students and teachers. Vivayic and Field of Hope are currently working with the NCDC to sanction the curriculum for use nationally.

**Recommendations/Application**
Vivayic and Field of Hope will conduct a pre- and post-test designed to measure knowledge and competency development during the 2018 school year. The results will then be used to improve the S1 lesson plans as well as develop the S2-S4 lesson plans. Additionally, Vivayic recommends that the curriculum be piloted in urban schools and in rural southern Uganda due to the diverse nature of the agriculture in these regions. Further, as the Ugandan NCDC continues to develop new curriculum, experiential learning and PBL approaches should be integrated into the design.

**References**
http://www.ifad.org/events/gc/30/roundtable/youth/benell.pdf