Oral Presentation Abstracts from the 2016 Annual Conference of the Association for International Agricultural and Extension Education
Agricultural Entrepreneurship Education Programs for Rural Youth: A Synthesis of Current Literature from Around the World

*This study was funded by a grant from innovATE

Seth B. Heinert
University of Florida
Agricultural Education and Communications
406 Rolfs Hall
Gainesville, FL 32611
sheinert@ufl.edu
(308)241-0277

T. Grady Roberts
University of Florida

Keywords: entrepreneurship education, engaging rural youth

Introduction/ Conceptual Framework/ Review of Literature
Entrepreneurship, the development of entrepreneurs, and entrepreneurship education has received increased attention recently (Morris, Kuratko, & Cornwall, 2013; Valerio, Parton, & Robb, 2014). Rural youth around the world, aged 15-24, are a significant and growing portion of the population (Bennell, 2010). Nearly three-fourths of the world’s poor live in rural areas around the world today, but the trend of mass outmigration has persisted in recent decades (Bennell, 2010; Cohen, 2006). A strong agriculture sector is important for livelihoods of the rural poor, poverty reduction, and food security (Bennell, 2010; Diao, Hazell, & Thurlow, 2010; FAO, 2009). For some time now, youth engagement and interest in agriculture the world over has been low and potential entry for many into agriculture has carried a host of challenges (FAO, 2014). Entrepreneurship education in an agricultural context for secondary students may reengage rural youth in agriculture and slow rural outmigration. Yet, little has been written about agricultural entrepreneurship education programs for rural youth enrolled in secondary education around the world.

The conceptual framework for this review was based on the work of Valerio, Parton, and Robb (2014). This conceptual framework has been modified in several ways with several variables added and the overall structure of the conceptual model reorganized. Figure 1 shows the conceptual framework for the study.
The purpose of this study was to synthesize available literature on rural youth agricultural entrepreneurship education programs to create a relatively holistic view of the current state of agricultural entrepreneurship education programming for rural secondary students.

Methods

Key words such as rural, youth, agriculture, entrepreneurship education, etc. were used to find primary and secondary literature sources from the internet and library sources. Priority for inclusion in this review was given to literature published within the last 20 years. Literature was grouped into categories based on the conceptual framework, established a priori. One researcher determined the relevancy and inclusion of the literature for this study, and, as such, may have introduced his own bias, which is an acknowledged limitation of this study.

Results

Context

The national and international context has been described by major reports and literature that described rural areas and youth in agriculture. Several major reports have described the entrepreneurial ecosystem around the world from a national or regional perspective such as the Ease of Doing Business Report issued by the World Bank (2015) and the Global Entrepreneurship Monitor (GEM) Global Report issued by the Global Entrepreneurship Monitor (2015). The context around rural areas shows investment in education, especially agricultural education and training, has received little or intermittent attention in many nations over the past several decades (FAO, 2010). Rural youth have persisted in migrating to urban areas which has led to problems in both rural and urban settings (Cohen, 2006). The context surrounding youth in
agriculture shows that large numbers of youth have recently left agriculture, (FAO, 2014; Sharma, 2007), have negative perceptions of agriculture, often associating it with subsistence and poverty (Muir-Leresche, 2013) and may have interest in agriculture, but lack resources and support to enter and persist in the industry (FAO, 2014; Kibwika & Semana, 2001).

Teacher Characteristics

Generally, teachers’ personal entrepreneurial experience or training did have an impact on what was taught and its effectiveness in the entrepreneurship education classroom (Ruskovaara & Pihkala, 2012; Seikkula-Leino et al., 2010). Teachers’ are open to teaching entrepreneurship (Ali et al., 2009). However, many teachers worldwide lack formal training or firsthand experience in entrepreneurship (Ruskovaara & Pihkala, 2012).

Student Characteristics

Traditionally, youth have been ignored as stakeholders (FAO, 2014). Today, many are unemployed or underemployed (ILO, 2014). Often, they are uninterested in agriculture or rural areas; but may have aspirations for entrepreneurship (Alibaygi & Poya, 2011; Ball & Wiley, 2005).

Program

Overall, entrepreneurship education programs around the world are highly variable (Cho, 2015). Experiential learning (Kolb, 1984) is a key component of design and delivery for many entrepreneurship education programs (Cooper, Bottomley, & Gordon, 2004; Dhilwayo, 2008; Morris et al., 2013; van der Sijde et al., 2008). Curriculum and content has focused on developing entrepreneurial mindsets and capabilities through student-established mini-corporations and home-based entrepreneurship programs (Markley et al., 2005; Morris et al., 2013; Oosterbeek et al., 2010; Valerio et al., 2014). Wrap-around support services provided to students were funding, mentors, information communication technology, business incubators, trade fairs, competitions (European Commission on Enterprise and Industry, 2009; IFAD, 2015; Ngurukie & Deshpande, 2013; Nor, 2015; Owualah, 1999).

Intended Outcomes

Overall, limited evaluations have been conducted (Cho, 2015; Valerio et al., 2014). Collectively, several studies used outcomes such as entrepreneurial mindsets and capabilities as well as business formation from entrepreneurship programs (Elert et al., 2015, Regele & Neck, 2012; Valerio et al., 2015).

Conclusions and Recommendations

The purpose of this study was to synthesize available literature on rural youth agricultural entrepreneurship education programs. From this review of literature, several conclusions can be made. The entrepreneurial ecosystem surrounding programs has been described by several major reports. Teachers have shown interest in teaching entrepreneurship, but sometimes lack prior knowledge for effective teaching. Students have traditionally been marginalized as stakeholders, blocked or feel discouraged from entry into agriculture, and are generally unemployed or underemployed. Programs use experiential learning to teach entrepreneurial mindsets and skills to secondary school youth. Common support services were providing funding, mentoring, access to business incubators and competitions. Program evaluations have rarely been conducted. However, some evaluations have demonstrated improved entrepreneurial mindsets and capabilities in program participants.
**Recommendations**

- Study the best practices and characteristics of exemplary programs.
- Monitor and evaluate programs to measure impact and guide future programming.
- Develop curricula using experiential learning that teaches entrepreneurial mindsets and skills.
- Provide support for aspiring entrepreneurs such as mentoring, funding, and business incubators.
- Create a consistent and coherent set of programs nationally or regionally.
- Provide teacher training on entrepreneurship education.

**References**


Application of Borich Needs Assessment to Rank Order Needed Social Marketing Competencies among Extension Professionals in India

Anil Kumar Chaudhary
Doctoral Student, Graduate Assistant
University of Florida
Department of Agricultural Education and Communication
Gainesville, FL
akchaudhary@ufl.edu
Phone # 352-273-2614

Eric A. Stubbs
Doctoral Candidate, Graduate Assistant
University of Florida
Department of Agricultural Education and Communication
Gainesville, FL

Laura A. Warner
Assistant Professor
University of Florida
Department of Agricultural Education and Communication
Gainesville, FL

Surya Rathore
Principal Scientist (Extension Information Systems)
ICAR - National Academy of Agricultural Research Management India
Rajendranagar, Hyderabad (T.S.), India

Theresa Pesl Murphrey
Associate Professor
Texas A&M University
Department of Agricultural Leadership, Education, and Communications

Keywords: Borich Needs Assessment, Competencies, Extension Professionals, India, Social Marketing

Introduction
Extension is known for bringing about positive community change such as the diffusion of new behaviors to improve the social, economic, or environmental status among a community (Rogers, 2003), and a technique known as social marketing has been identified as an increasingly valuable approach to behavior change (Reilly & Andrews, 2009). Social marketing has roots dating back to the 1950’s in India (Deshpande & Lee, 2013) and involves the application of commercial marketing techniques to behavior change programs. The process begins with identifying the target audience and desired behavior change (McKenzie-Mohr, 2011). Next, analysis of the target audience’s barriers, development of a strategy, pilot testing, and implementation follow.
A need for professional development in social marketing has been documented in certain Extension contexts (Reilly & Andrews, 2009; Warner, 2014) and the competencies necessary for Extension professionals to complete this process have been identified (Warner, Stubbs, Murphrey, & Huynh, n. d.). The current study built upon this previous needs assessment in the context of Extension programming in India. Competency-based professional development provides clarity in desired outcomes that can improve learner performance (Calhoun, Ramiah, Weist, & Shortell, 2008). The Borich needs assessment method allowed for the identification of competencies that were most in need of professional development (Borich, 1980).

**Purpose and Objectives**

The purpose was to conduct a needs assessment among Extension professionals in India for application of social marketing in their work. The specific objective was to rank order social marketing competencies according to expressed need for knowledge and skill development among Extension professionals in India.

**Methodology**

This descriptive, cross-sectional study is part of a larger study conducted to document the knowledge, understanding, skills, use and interest in social marketing among Extension professionals in India. The target population for this study consisted of all the Program Coordinators of Krishi Vigyan Kendras. A researcher-developed electronic survey was distributed by email to all Program Coordinators ($N = 609$) through an initial contact followed by three reminders. Of those, 64 addresses were undeliverable. Out of remaining good emails ($n = 545$), 61 started the survey and 22 surveys were considered complete for the purpose of data analysis.

The survey instrument measured the importance (1 = *no importance* to 5 = *utmost importance*), knowledge level (1 = *no knowledge* to 5 = *exceptional knowledge*), and skill level (1 = *no skill* to 5 = *exceptional skill*) associated with each of the 37 competencies previously identified in a Delphi study of Extension professionals and researchers ([Authors], 2015). A panel of experts on international Extension systems, survey methodology, and the culture of India was utilized to establish the survey’s validity and reliability. The post-hoc reliability was calculated for all 37 competencies for their importance, knowledge, and skills. Cronbach’s alpha was found satisfactory (0.978, 0.981, and 0.982 for importance, knowledge, and skill levels, respectively).

Using Microsoft Excel, each of the 37 competencies for each respondent yielded discrepancy scores (DS) for knowledge competence and skill competence. Knowledge and skill DS were calculated by subtracting each respondent’s knowledge or skill score from the importance score. Ranking knowledge competence and skill competence for each competency was accomplished through the calculation of a weighted discrepancy score (WDS) by multiplying the DS by the mean importance score for each. Mean weighted discrepancy scores (MWDS) were then calculated by summing the WDS and dividing by the sample size (Borich, 1980).

Knowledge and skill MWDS were used to rank the competencies based on need for trainings for application of social marketing, with higher MWDS indicating greatest need for professional development. We rank ordered knowledge competence MWDS and skills competence MWDS separately. Institutional Review Board approval was secured prior to conducting the study.
Results

The top five social marketing knowledge competencies were: identifying issues for applying a social marketing approach (MWDS = 4.61); communicating results of social marketing campaigns (MWDS = 4.30); designing programs based on specific behavioral goals (MWDS = 3.85); using social marketing tools (MWDS = 3.77); and understanding techniques employed in social marketing (MWDS = 3.77).

The top five social marketing skill competencies were: identifying issues for applying a social marketing approach (MWDS = 4.61); using social marketing tools (MWDS = 4.56); communicating results of social marketing campaigns (MWDS = 4.30); understanding techniques employed in social marketing (MWDS = 4.08); and designing programs based on specific behavioral goals (MWDS = 4.05).

Discussion and Conclusions

The results point to opportunities to increase both knowledge and skill levels for applying social marketing principles to Extension work among Program Coordinators. All respondents indicated challenges in using social marketing tools and communicating results of social marketing campaigns to stakeholders. Program Coordinators also revealed a gap in knowledge and skills for designing of programs based on social marketing principles. The Borich needs assessment model was found to be a useful method of ranking the competencies that should receive priority for training to improve knowledge and skills needed to apply social marketing to Extension programming.

Recommendations and Implications

Based on study results, we recommend professional development organizations in India concentrate on increasing knowledge and awareness about social marketing, with a focus on the processes of identifying appropriate target behaviors and designing social marketing programs that will ultimately achieve behavior change. Because of its systematic and organized approach to needs assessment, we consider the Borich needs assessment model a valuable approach to prioritizing competencies for professional development in the environment of stressed resources. The findings of this study can be utilized by Extension professionals, professional development organizations, and government agencies to prioritize professional development offerings for improving the use and delivery of Extension programs using social marketing.

Limitations

Caution is advised in the interpretation of results due to the small sample size, and we present the findings as an exploratory study to examine the status of social marketing in India. Despite a low response rate, we believe the results provide an important starting point in understanding gaps in knowledge and skills needed to apply social marketing, a promising approach to behavior change, to Extension programming in India.

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Assessment of Farmers’ Knowledge and Use of Key Recommendations for Potato Production and Marketing in East Hararghe Zone of Ethiopia

Mahlet Abitew
Haramaya University,
Ethiopia

Bezabih Emana
HEDBEZ Business and Consultancy,
Ethiopia

Mengistu Ketema
Haramaya University,
Ethiopia

Jeffreyson K Mutimba
Winrock International,
Sasakawa-SAFE, P.O. Box 24135, Code 1000,
Addis Ababa, Ethiopia
Cell: +251 911 802 563,
E-mail: jmutimba@field.winrock.org

Jemal Yousuf
Haramaya University, Ethiopia

Keywords: key recommendations, farmers’ knowledge, farmers’ practice

Introduction

Ethiopian economy is highly dependent on agriculture that accounts for 43% of the GDP, 80% of employment and 90% of export (MoFED, 2011). Potato is one of the main crops which plays a significant role in supporting household income of approximately one million farmers (CSA 2008/2009) in the country. It is also an important source of food during major food deficit periods which usually occur between June and August (Yeshitita, 2012). The country has suitable edaphic and climatic conditions for the production of high quality potatoes (Tekalign, 2010; Endale et al., 2008; Fekadu and Dendena, 2006).

Farmers in East Hararghe Zone have good access to market with four large towns (Dire Dawa, Haramaya, Harar and Kombolcha) within a few kilometers of each other and connected by a very good road network. In addition, a lot of potatoes from this area are also exported to neighbouring Somalia (Bezabih, 2008) and Djibouti. Potato is the best crop in giving high economic return per unit of land and time (Tekalign, 2006) in this area. The presence of a regional domestic market and cross-border and export market outlets has contributed to the development of a potato culture in Hararghe. The crop is a major source of livelihood for a large number of farmers, transporters, middlemen and traders in the area (Tekalign, 2010).
Purpose and Objectives

Despite the potential potatoes have in improving farmers livelihoods in Hararghe Zone, the average yields remain very low - 19.3 t/ha (CSA, 2014) while the achievable potential is 50 t/ha (Haverkot et al 2012). The reason for this huge gap are not clear. This study was conducted to establish the levels of farmers’ knowledge of key recommendations on the potato value chain and the extent to which farmers apply the recommendations. The underlying assumption of this study was that if farmers are to be successful in the value chain, they must know and apply the key recommendations for successful production, processing and marketing of potatoes.

Methodology

Key recommendations for potato production were identified from a booklet prepared by Haramaya University in collaboration with USAID and FAO in 2010. The recommendations covered varieties, plant spacing, planting method, fertilizers, earthing, harvesting, post-harvest handling and marketing. Based on the key recommendations a knowledge test was constructed to assess farmers’ knowledge of the recommendations. In addition, a checklist was constructed to assess farmers’ application of the recommendations. The knowledge test and checklist were validated by a team of four experts. Multi-stage sampling technique was used to select 400 farmers - 372 men and 28 women. The knowledge test was administered in the form of an interview schedule while farmer application was assessed through observation and measurement. A marking scheme was designed for scoring knowledge and application of recommendations. Data were analyzed through descriptive statistics. The Bloom’s (1956) “Cut of Points” was used to place famers’ performance into three categories - good (80% - 100%), moderate (61% - 79% and poor (<60%).

Results, Discussions and Conclusions

Among the results were two main surprises (Table 1). First, while only 10% of the farmers had good knowledge of the recommendations, 20.5% actually applied the recommendations correctly. One possible explanation to this is that there were farmers who could not articulate the recommendation orally but knew how to apply practically.

Table 1: Levels farmers’ knowledge and practice

<table>
<thead>
<tr>
<th>Level</th>
<th>Knowledge</th>
<th>Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Good</td>
<td>40</td>
<td>10.0</td>
</tr>
<tr>
<td>Moderate</td>
<td>141</td>
<td>35.2</td>
</tr>
<tr>
<td>Poor</td>
<td>219</td>
<td>54.8</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td>100.0</td>
</tr>
</tbody>
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Second, while 35.2% had moderate knowledge, only 12% could apply the recommendations reasonably well. This means that there were many farmers, at least 22%, who did not apply all the knowledge they had. Farmers gave several reasons for their failure to follow recommendations among which the two most important reasons related to cost and availability of inputs. Most (94.2%) mentioned cost of inputs as a major factor. The inputs were not only costly but were also not easily accessible according to 80.2% of the farmers.
Overall, the anomaly between knowledge and practice for 10% of the farmers notwithstanding, farmers’ knowledge was generally poor with 90% falling under ‘poor’ to ‘moderate’ categories. There was therefore a strong need for training.

**Recommendations**

Farmers’ problems with high cost of inputs is also a function of their low income levels. Farmers have difficulty in raising capital to purchase inputs. This problem could be addressed through savings groups where farmers regularly save small amounts of money as determined by the groups. In this way they can save toward purchasing inputs. This would be a less costly method of raising capital than going to commercial lenders who charge high interest rates. Because the farmers will be saving for a purpose, they will work closely with Cooperative Agents to arrange for timely delivery of inputs from Cooperative Unions.

Savings groups will also greatly enhance farmers’ access to knowledge and information as it will be easier for service providers to engage the farmers in their groups. In addition, the groups will enhance their capacity to identify markets, negotiate with buyers and with transport providers as well as representing members’ broader interests.

**Implication for Field Extension Research**

The main role of an agricultural extension worker is to ensure that farmers have knowledge and skills to farm successfully. This could be knowledge and skills to manage an enterprise, a catchment area, or a farmers’ organization. The above method enables the extension worker to systematically assess the level of farmer knowledge and practice and to accurately identify opportunities for improvement.

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Associating Importance of Water with Need: Using Public Opinion to Tailor International Extension Programs

Kumudu P. P. Kopiyawattage
Graduate Assistant
Agricultural Education and Communication
University of Florida
PO Box 110540
Gainesville, FL 32611
kumudupdn@ufl.edu
352-273-3425
352-392-0502 Fax

Alexa Lamm
Assistant Professor
Agricultural Education and Communication
University of Florida
alam@ufl.edu

Keywords: Water supply, water quantity, natural resources, extension, public opinion

Introduction
Water is the most essential element for the sustainability of our global ecosystem. Water is a critical issue in many parts of the world and is recurrently identified by agricultural and natural resource leaders as the top issue in Florida (Odera, Lamm, Dukes, Irani, & Carter, 2013). Water related issues reported globally includes water scarcity, water quality degradation, management of land use, climate change, and water logging (Young, Dooge, & Rodda, 1994). Participation in extension programs have an influence on awareness of environmental issues (Singletary & Daniels, 2004) hence, extension programs can affect public perceptions of the need to protect water resources. Prokopy, Molloy, Thompson, and Emmert (2010) found public opinions on water availability could be used as a tool to tailor extension programs to specific audiences. Therefore, identifying public opinion of water issues is important for international extension educators and can provide direction for effective program design and delivery.

Purpose and Objectives
The purpose of this study was to identify how public opinion of water issues can guide the development of effective extension programs. The specific objectives of the study were to:
1. Identify the importance respondents associated with plentiful water resources;
2. Determine which water related topics were of most interest to respondents; and
3. Identify preferred modes of learning based on importance associated with plentiful water resources.

Methodology
This descriptive study used an online survey based on the RBC Canadian Water Attitudes Survey (Patterson, 2012) to capture public opinion of water issues in Florida. A panel of experts
with extensive knowledge of water quantity issues established face validity and content validity
of the study. Respondents were asked to indicate the level of importance they associated with
plentiful water resources for seven segments (e.g. bays, estuaries, springs, etc.) on a five point
scale: 1- not at all important, 2- slightly important, 3-fairly important, 4 -highly important, 5-
 extremely important. Next, respondents were asked to indicate the most preferred water-related
topic they would be interested in learning about and the learning opportunities they would prefer
to use to learn more about water related topics. Demographic data were also collected.

The survey was sent to 1,192 Florida residents and 63% response rate (N = 749) was
obtained. Post-stratification methods (Kalton & Flores-Cervantes, 2003) were used to ensure that
sample was representative of residents. For data analysis, responses to the seven segments were
averaged to create an importance of water quantity score and respondents were segmented into
high, average and low categories using the Z scores. Preferred water-related topics and learning
opportunity preferences were examined descriptively within the three segmented groups. Chi
square tests were used to analyze the association between learning preferences and importance of
plentiful water resources to determine if differences between the three groups existed.

**Findings**

Approximately 85% of the respondents indicated plentiful water resources as highly or
extremely important across all seven areas. When segmented based on z scores, 35%, 33% and
32% ranked the importance of having plentiful water resources as high, average and low. Female
respondents dominated the high group. When asked about their preferred water-related topics,
respondents within all three groups indicated home and garden landscaping, fish and wildlife
water needs and restoration of fish and aquatic habitats highly. The least preferred topic was
landscape buffers followed by watershed restoration and irrigation management. Visiting a web
site, followed by watching TV coverage were the most preferred modes of learning (Figure 1).
However, the high group was more interested in all types of learning opportunities compared to
the average and low groups. A Chi-square test was used to determine if differences were
significant based on a $p < .05$ set a priori. Respondents’ importance of plentiful water resources
were significantly different except for fact sheets, bulletins or brochures and reading newspaper
article or series.
Implications, Conclusions and Recommendations

It is positive that a majority of the respondents considered having plentiful water resources as important since water is one of the top issues facing the agricultural and natural resource sector (Odera et al., 2013). According to the audience segmentation literature, the ‘high’ group should be the focus of extension programs because they are highly concerned about water quantity and therefore most likely to change (Monaghan, Ott, Wilber, Gouldthorpe & Racevskis, 2013). In that ‘high’ group women represented the majority, indicating the importance of specialized programs on educating women about water quantity issues because women’s roles in household and agriculture is important even though it may not be visible (Sachs, 1983; Whatmore, 1990).

Getting trained for programs and attending seminars and workshops, which are the most commonly used face-to-face extension delivery methods, were the least preferred by the respondents which highlights a need for change in practice. The most preferred learning modes were visiting web sites and watching TV coverage. This could be due to flexible hours, proximity and availability. People are very busy with their day-today activities; therefore they may face difficulties in allocating time for extension programs. Therefore shifting international extension programs to utilize online delivery methods or a blended approach may be an alternative to disseminating information.

This study only touches the surface on segmenting audiences to further target international water focused extension programs. There are many areas for further investigated. First, the same study should be replicated in different states and different parts of the world to explore whether there are differences or similarities in learning modes and preferred learning topics. Perhaps there are global similarities and an international online program could be developed to address water quantity issues around the world in one place. Further research could then be conducted to determine if online formats have an impact on behavior change. It would also be advised to conduct research on existing water-focused international extension programs to determine who is currently attending these programs or participating as volunteers and determine the motivations behind their participation.
References


Blending Philosophical and Ecological Frameworks: Enhancing Local Nutrition through Healthy Soils and Appropriate Community Innovations

Adam B. Cobb
Oklahoma State University
008C Agricultural Hall
Stillwater, OK 74078
Tel. #: 405.338.5821
FAX #: 405.744.5176
abcobb@okstate.edu

M. Craig Edwards, Ph.D.
Oklahoma State University

Gail W. T. Wilson, Ph.D.
Oklahoma State University

Keywords: community development, econutrition, interventions, soils

Introduction
Many developing countries are struggling to improve public health, education, and reduce poverty while needing to protect their natural resources – such as productive soils – that are major drivers for social and agricultural progress. A review of soil decline in sub-Saharan Africa (SSA) has indicated food production demands are leading to loss of soil fertility, loss of ecosystem services, and the inability of small-scale farmers to produce enough food for their families (Tully, Sullivan, Weil, & Sanchez, 2015). The authors signaled the critical need to address sustainable soil management through research and extension.

In addition, chronic human malnutrition of protein, iron, zinc, and calcium impact about one-half of the world’s population, and these concerns have inspired a campaign for biofortification of food crops through genetics and improved farm soil management (Carvalho & Vasconcelos, 2013). We suggest, it is critical for agronomic researchers to consider the vast implications of Everett Rogers’ (2003) theory. His innovation adoption framework provides guidance for scientific inquiry to improve local food systems. One example is breeding crops to more effectively partner with beneficial soil microbes and support yield with minimal input (Denison, 2012). This idea is gaining popularity as a way to reduce human impacts on natural systems (Bender, Conen, & Van der Heijden, 2015).

Navarro (2008) suggested that effective solutions to the issues and causes of poverty should link local people, institutions, and their pooled indigenous knowledge with outside facilitators as “an interactive and integrative model of shared knowledge and joint discovery” (p. 75). This would suggest that any technology a change agency considers introducing to a community must be reimagined through the local prism and implemented in ways appropriate for that population. That can present many challenges, given the knowledge gap regarding scientific principles, soil dynamics, and microbial ecology. However, examples like the One Acre Fund demonstrate that improved soil management and enhanced crop genotypes can successfully diffuse through communities via Farmer Interest Groups (FIGs) and change agencies that design interventions in harmony with Rogers’ theory (Thurow, 2013).
Purpose and Objectives

We will highlight a series of links between the social science philosophies of Rogers, Navarro, and others with our on-going soil agroecology research. It is imperative to bridge these disciplines if the goal is developing sustainable, community-based food systems. Our research was inspired by discussions with scientists and extension professionals from SSA and their concern that US seed was ineffective for local farmers. We have explored belowground mechanisms that may explain and alleviate the issues they observed. In forging these ecological and social science links, we will advocate transdisciplinary collaboration and research projects that assess both soil ecology and human social dynamics in the context of local food production.

Themes/Data Sources

An emerging paradigm of interconnected problems related to community malnutrition, poor agricultural management, and environmental degradation is being called econutrition (Blasbalg, Wispelwey, & Deckelbaum, 2011; Deckelbaum, Palm, Mutuo, & DeClerck, 2006). This approach suggests that groups interested in finding solutions for any of these problems within a community must integrate interventions to improve all three, rather than addressing a single issue. Soils become a foundation for multisectoral community programming, and link a range of innovations through agriculture, nutrition, and natural resources.

Beneficial soil fungi present an opportunity to make global agriculture more efficient, more sustainable, and more productive (Ellouze et al., 2014). Crop symbiosis with arbuscular mycorrhizal (AM) fungi provides a potential path to maintain or improve food production and nutrition with fewer economically and environmentally costly fertilizer inputs. However, these nutrient-providing relationships may have been suppressed in some modern crops, presumably because they were selected under high fertilizer inputs resulting in profoundly reduced AM dependence (Hetrick, Wilson, Gill, & Cox, 1995).

Our research examines genetic and environmental influences on AM dependence of various sorghum genotypes. Results indicate African genotypes rely strongly on AM fungal partnerships in low-nutrient soils, i.e., the soils of SSA, while modern genotypes do not. Therefore, seed selection is critical to farming success in local communities. Our recent microbial analyses of farm soils in eastern Zambia indicate that AM fungal activity is being impaired by current farming methods. This is linked to losses of soil carbon and nutrient efficiency. In the race to repair soil microbial networks, change agencies must avoid unintended consequences resulting from ineffective or locally incompatible products, e.g., commercial soil inoculum. We suggest locally available solutions provide the best return, while also reducing cost. For example, biochar and worm compost can be produced in many communities, and our research indicates they can boost AM fungal activity and reduce fertilizer application rates while maintaining yield and crop nutritional status.

Conclusions

If agronomic research ignores the lessons of Rogers (2003) and other change theorists, it may produce methods, technologies, and other innovations that are inappropriate and/or detrimental for communities in developing countries. Unique issues related to fertilizer inputs, infrastructure, and the knowledge base of local farmers should be considered in research design (Navarro, 2008). Our results demonstrate that carefully assessed microbial partnerships present
an opportunity to enhance the sustainability of local food systems through suitable crop genetics, improved farm soil management, and other appropriate innovations.

**Implications**

Crops selected for microbial partnership and bred in low-nutrient soils may increase local production and food quality in developing countries. The resulting seed would provide relative advantage (Rogers, 2003) compared to fertilizer-dependent genotypes and should increase the rate of adoption. If we utilize field inoculum to boost symbiotic partnership, it is imperative to select microbial sources that are adapted for local soils (Johnson, Wilson, Bowker, Wilson, & Miller, 2010). Improved farming practices and alternative nutrient inputs are more fundamental than inoculum, and they can be addressed locally through educational interventions that emphasize observability and trialability (Rogers, 2003). These strategies will be best conceived and implemented if agricultural researchers consult with international extension professionals, and together develop a feedback mechanism from communities (Navarro, 2008).

**References**


Introduction

Sri Lanka’s agriculture sector contributes around 11% to the country’s total GDP (Department of Census and Statistics, 2014). Public sector agriculture research, which is implemented by the Department of Agriculture, focuses on distinctive areas such as crop variety development and productivity improvement (Centre for Alleviation of Poverty through Sustainable Agriculture, 2013) while agriculture extension’s main focus is to disseminate information to needed communities. Work is needed to address the gap between research and extension in Sri Lanka (Centre for Alleviation of Poverty through Sustainable Agriculture, 2013).

When research and extension is functionally linked together, there is enhanced flow of information and use of research findings (Webb, 1998), which helps to disseminate knowledge
through outreach to demonstrate programs. Radhakrishna (2009) discussed the advantages of this integration and stated the importance it carries in marketing research and extension programs to the general public, demonstrating the benefits of integration to its stakeholders, and developing effective mechanisms to communicate research and extension activities to stakeholders. Since agriculture is moving towards a more complex system perspective (Davis & Sulaiman, 2014), it is important for agriculture extension agents to strengthen their linkages with researchers to meet demands of people.

**Purpose and Objectives**

The purpose of this study was to assess current research-extension activities in the perspectives of government sector extension agents. Specific objectives of the study were to:

1. Identify the types of existing collaborations of agriculture extension agents with agriculture researchers;
2. Identify the types of collaboration of agriculture extension agents with other national and international research institutions; and
3. Identify the limitations faced by agriculture extension agents in linking with researchers.

**Methodology**

This study was conducted in Anuradhapura provincial region of Sri Lanka. A researcher-developed instrument was used to guide face-to-face survey interviews with public sector agriculture extension agents (N = 45). An expert panel with expertise in agriculture extension and education reviewed the instrument to ensure content and face validity. The instrument and study protocol was approved by the University of Florida Institutional Review Board.

Respondents were first asked to indicate the types of existing collaborations of agriculture extension agents with agriculture researchers on a Likert-type scale ranging from a – several times per week, b – weekly, c – once in two weeks, d – monthly, e – never. Then the respondents were asked to indicate which of 12 type of research extension collaborations they have with other national and international research institutions. They were also asked to express their opinion on limitations they face in linking with agriculture researchers.

**Results and Discussion**

The majority of respondents (49%) were between to 18-29 years old and 53% were females. Among respondents, 64% had less than 5 years of work experience and 32% were recently employed with less than one year of experience. About 87% of the respondents held agriculture diplomas and 13% had Bachelor’s degrees in agriculture. The respondents were asked to indicate how often they interact with agriculture researchers in an index of four: a) weekly, b) once in two weeks, c) monthly d) sometimes e) never. Of the respondents, 69% indicated they sometimes interact with researchers followed by the 20% who interact monthly with researchers. Then the respondents were asked about the nature of their interactions with extension agents. Thirty eight (48%) of the respondents indicated that they primarily interact with research agents to update their personal knowledge, followed by 20% who consult researchers to find answers to farmers’ problems, and 13% for training opportunities. Among the respondents 52% indicated they were satisfied with the interaction with researchers. Among those who indicated they were not satisfied, 45% indicated that researchers do not have adequate
information available to solve their problems and 27% indicated it is too time consuming to reach researchers. Some of the solutions suggested by extension agents to improve the linkages were organizing monthly meetings and conferences, give researchers a time to visit farm fields and observe the problems themselves, increase budgets for research and extension, and improve infrastructure facilities such as ICT in extension.

Then the respondents were asked about collaborations with other private sector organizations nationally. Forty-two percent of the respondents indicated they collaborate with other private organizations in terms of getting training opportunities and sharing research information. The factors respondents believed prohibit access to information and literature on agricultural research and extension were poor communication, lack of time, poor coordination, and lack of facilities. The respondents face major constraints to linkages between agricultural extension and research which include inadequate funding, lack of information, poor facility infrastructure, and not getting up-to-date information.

Respondents provided suggestions for strengthening research-extension linkages: improving infrastructure facilities, improving ICT and other communication facilities, training, and improving mechanisms to disperse timely information such as library, internet and computer facilities.

**Implications, Conclusions and Recommendations**

According to the findings of the study several conclusions could be drawn. First and most importantly it is clear that there is no proper linkage between extension agents and researchers. There is a great opportunity to provide capacity building support for extension workers to improve their ICT and other communication skills, which will help them to interact with researchers and explore other research findings nationally and globally. Enhancing private sector research participation in terms of collaborations or partnerships would facilitate the linkages and facilitate the transfer or research and knowledge, including new technology updates. It was also concluded that establishing regional research centers to conduct area-specific research and upgrade the facilities of existing regional research centers would be a good suggestion to strengthen the linkage between research and extension. As suggested by respondents themselves, funding is a major constraint not only in the research and extension, but also throughout the entire agriculture sector. Despite the considerable share agriculture contributes to GDP of the country, the money allocated for research and extension is very limited. According to the discussions with agriculture extension agents it was realized that they do not receive appropriate research information on time. Therefore, there would be great value in a mechanism developed to disseminate research information from research centers to the field extension agents, and this would be helpful to strengthen the linkage.

**References**


A Case Study Examining the Complexities Associated with Dynamic International Academic Partnerships formed to Address Complex Issues and Systems

Alexa J. Lamm
University of Florida
PO Box 112060
Gainesville, FL 32611-2060
Ph. 352-392-6545
FAX 352-392-0589
alamm@ufl.edu

Tracy Irani
University of Florida

Martie Gillen
University of Florida

Keywords: case study, self-directed working groups, academic partnerships, issues

Introduction
Self-directed working groups are an important way for stakeholders to explore, understand, become informed, and work together to solve complex issues. Groups exist because members want to share common activities, interests and knowledge (Wellins, Byham & Wilson, 1991). Key functions of working groups include convening members, exchanging information, sharing best practices, making decisions, coordinating resources and communicating (Kauffeld, 2006). Since no one organizational entity can manage an agricultural issue alone, such groups become essential to members and the organizations they represent to network, navigate available resources, and communicate effectively.

Extension has always been a key player and sometimes convener of community working groups engaged in issues management (Patton & Blaine, 2001; Warner, Hinrichs, Schneyer, & Joyce, 1998). But working with groups can be challenging. Diverse international academic partners have different goals and structures that work must fit within. As the world becomes smaller, and as funding sources focus on large multidisciplinary research/Extension teams, it is important to understand why some groups work together well while others do not achieve their objectives (Lamm, Harder, Irani, Roberts, & Snyder, 2011). Examining dynamic international academic partnerships may shed light on the communication networks that thrive, as well as those that struggle, to offer insights into how teams can be more effective when addressing global issues.

Purpose and Objectives
The purpose of this research was to explore the successes and challenges an international academic group faced communicating internally when convened to address a critical issue facing the agricultural industry. The research was conducted to identify ways that relationships can be strengthened and how extension educators can play a role in bridging gaps among academics and those they are funded to serve. The research was guided by the following research objectives:
1. Define the SAFGOV academic team goals, strategies, and team players;
2. Identify successes in communicating internally; and
3. Identify the challenges faced communicating internally.

Methods

A case study research design was employed to elucidate an in-depth description of the factors explaining the state of the phenomenon. Case study research “involves the study of a case within a real-life, contemporary context of setting” (Creswell, 2013, p. 97) and is considered a comprehensive approach to understanding a bounded system (Denzin & Lincoln, 2005; Merriam, 1998; Yin, 2009). The SAFGOV team was chosen for this research because it has many characteristics typical of an international collaborative academic endeavor. While this approach offers depth, it lacks breadth outside of the area of study. Observations of the project team and artifacts from group process served as the data. Project team notes, meeting minutes, workshop agendas, team emails, products, and conversations among project participants were reviewed, catalogued and analyzed and an audit trail was kept. Researchers analyzed the data and peer debriefed on their findings to establish trustworthiness and internal validity (Merriam, 1998).

Results

The overall purpose of the SAFGOV project was to build an international community of researchers able to jointly undertake research on the effectiveness of food system governance for food security and drivers of land use change. The SAFGOV project team was comprised of faculty from three countries – Great Britain (UK), South Africa (SA) and the United States (US). The project funding mechanism was comprised of three major funding agencies in the represented countries: US - National Science Foundation (NSF); UK- Natural Environment Research Council (NERC); SA – National Research Foundation (NRF) which intended to foster international collaboration.

Several strengths were identified. First, the team was loosely structured. The loose structure allowed for independence of team members and assisted in the creative process. Academic differences in norms were also identified as strengths. The UK partners were theoretical in their approach, interested in researching the governance process rather than influencing change, while the US partners were more applied, wanting to partner with stakeholders and develop solutions that could be implemented. Another strength was the close geographic ties of several of the members. Geographically, the UK and SA are only six hours apart by air.

However, several of the strengths also proved to be challenges. First, the prior working relationships between the UK and SA partners limited the ability of the US partners to fully engage. In addition, the US is an eight-hour flight to England and 14 hours to Pretoria, SA, limiting the US partners’ ability to participate face-to-face. The real and figurative distance constrained the ability of the US partners to fully participate. As a result, the majority of internal communication happened via email. Two forms of asynchronous communication were also used; a project web site and a virtual discussion forum.

The theoretical approaches, while expected to be complimentary, also provided challenges. When the US partners were able to attend, they held an applied discussion with stakeholders that led to the development of a new, nonlinear model mapping the relationships among the SA food system components. While more aligned with project goals, the new model was not adopted. Lastly, the only avenues available for future funding were each country’s principle funders, none of whom would provide funds for a US partner. Once project partners
returned home, the UK and SA team members pursued writing research articles together, and communication with the US partners declined.

**Implications and Recommendations**

The findings revealed there are benefits to dynamic international academic teams. Differences in approach and loose group models allowed for the free flow of information and resulted in new applications and potential solutions to complex problems. However, if those approaches are not communicated internally when the new team is developed, the viewpoints may not be valued, resulting in little progress (Parsons & Urbanski, 2012). This research further shows the need for strong internal communication as a team is built. The world is facing an increasingly diverse set of problems; if we are going to work collaboratively to solve them we need to look in to the internal workings of international teams as they are developed to ensure success.

**References**


A Case Study of Women Participants of a Community Gardening Project in Turkana County, Kenya

Cynthia McKenney
Associate Chair and Rockwell Endowed Professor of Horticulture in Plant and Soil Science
Texas Tech University
Department of Plant and Soil Science
Bayer Plant Science Building, Room 105
2911 15th Street
Mail Stop 2122
Lubbock, TX 79409-2122
(806) 834-0722
Cynthia.mckenney@ttu.edu

Madison Landreth
Graduate Research Associate
Texas Tech University
Department of Agricultural Education & Communications

Mary Murimi
Professor
Texas Tech University
Nutritional Sciences

Matt Baker
Professor
Texas Tech University
Department of Agricultural Education & Communications

Keywords: Community garden, women in development, Turkana County Kenya, Case Study

Most residents of Turkana County in northwest Kenya are nomadic pastoralists (Little & Leslie, 1999). The Turkana climate is semi-arid, hot, and dusty (Little & Leslie, 1999). This county borders South Sudan, Uganda, and Ethiopia is drought-prone (McCabe, 2004) and is plagued is with a 65% poverty rate (Saisi, 2009). In 2013, a community group in Nadapal, a village 13 km southwest of the capital of Lodwar requested that Share International (Share), an established NGO with a long-standing presence in the community, help them to develop a community garden. Share partnered with Texas Tech for expertise in semi-arid horticulture. In 2013 and 2014, planning teams consisting of a community nutritionist, horticulturalists, and an agricultural educator met with the Share staff on-site. The community gardening project in Nadapal was established in summer 2014.

The theoretical framework for this monitoring study is based upon Farming Systems Research/Extension (FSR/E) approach as recommended by Alonge and Martin, (1998) and Sjah, Cameron, and Woodford, (2006). FSR/E emphasizes both social equity and gender sensitivity (Hildebrand, 1990; Norman, 2002). This purpose of this study was to provide enticing (insider) and
etic (outsider) perspectives of the project through a rich and holistic description of how women in the village have been effected by the project.

1. What is the present status of participants and how has their livelihood situation changed over time?
2. What new heuristics or insights can be drawn from participants and their thoughts on the phenomenon of the new project?

The team used an intrinsic case study design for this study. Ary, Jacobs, Sorensen, and Walker (2014) state that a case study “focuses on a single unit to produce an in-depth description that is rich and holistic” (p. 454). Dr. Mary Murimi, the lead member of the on-site evaluation team is a native Kenyan with experience working in Turkana and a community nutrition faculty member at Texas Tech. The interviews were conducted by female NGO employees. The 15 women interviewed were self-identified as being active in the project. Personal interviews were conducted by two female NGO employees. The women interviewed were self-identified as working in the garden. The interviews were translated from English to Turkana, and responses from Turkana to English. There were fifteen women interviewed during the course of this study.

The majority of participants were raised in the village, as most women in Turkana remain in their homes as the men leave with goat herds for extended periods of time. Their lives have been good but hard. Sixty-percent of the participants indicated that their livelihoods were dependent on goat production. The women were content with their family life. When asked to provide insight on their families, it was not uncommon for the women to provide descriptors such as, “my family is quite good besides small challenges we face”.

These women indicated that their husbands had jobs that included pastoralists, chief, and mat weaver. Meanwhile, 40% had husbands who were unemployed or deceased. Only one-third said that their husbands helped in the garden. Ten women stated their children have been involved in the garden. The average number of children was 5.7, with ages ranging from two to forty. The women believed that children should not work in the garden below the age of eight. Only 36% of the women stated that their children have moved outside of Nadapal.

They have grown kale, spinach, cowpeas, tomatoes, onions, maze, sorghum, and watermelon. Several women generated income from weaving mats or raising goats and five of the fifteen women stated they have no source of income. The women shared that on average, they consume two meals per day. Dr. Murimi indicates that a meal has a broad definition which can include a single cup of tea.

Their day-to-day role in the garden included planting, watering, digging, copping, growing, and weeding crops. The average total time the women have spent working in the garden was 5.6 hours. The crops harvested from the garden had several different uses, which included keeping the seed for replanting, cash generation for sustaining the garden, cash generation for family use, and dividing the produce among the members of the participants. All of the women stated that there has been discussion for continuance of the garden. The cash for garden continuance went to buy generator fuel to run the irrigation system or purchase new seeds. Cash from produce sales that went for family needs was used to purchase maize, kale, oil, and flour.

The plan for continuance is to obtain seed from an outside resource, buying seed, or keeping seeds from previous harvests. The irrigation system will be maintained by group members. Regarding the continuance of the garden, the women were most worried about
maintaining a practical system for watering the crops. All fifteen women indicated they would like to receive additional information about how to grow and prepare crops. Additionally, all fifteen women stated they have the knowledge to grow and water planted crops.

Six of the women inquired about watering the garden. Three women requested further training. This study provided insight on the influence that a community garden has had six months after establishment on the women involved. The external partners should provide continued technical and educational support to ensure continuance of the project. Jivetti and Edwards (2008) reported that in Western Kenya a “lack of proper training and skills further exacerbates women’s poverty causing a vicious cycle of impoverishment” (p.266).

Upon reflection of the study through her perspective, Dr. Murimi suggested that the women in this community “want to learn”, “don’t give up easily”, and are “serious, meaningful problem solvers”. These statements disclose the culture’s determination and perseverance. With minimal external support, the garden in Nadapal can serve as a prototype for other neighboring villages in fighting persistent food insecurities.

**References**


Cocoa pulp juice value chain development for alcohol production and poverty alleviation among farmers at Akuako community in Eastern Region of Ghana

**Festus Annor-Frempong**  
Department of Agricultural Economics and Extension  
School of Agriculture  
University of Cape Coast, Ghana  
Tel: +233244741679  
Email: papaannor@yahoo.com

**Samuel Mawudeku**  
Cocoa Research Institute of Ghana  
Tafo, Eastern Region, Ghana  
Tel: +2332444527135  
Email: sewupepe@gmail.com

**Mercy Akeredolu**  
Sasakawa Fund for Extension Education  
Abuja, Nigeria  
Tel: +2347030577768  
makeredolu@winrock.org

**Keywords:** Extension action research methodology, value chain, alcohol production, cocoa pulp juice, income generation and poverty reduction

**Introduction**
Cocoa is cultivated to support the livelihoods of many people on over 1.2 million hectares of land in Ghana but majority of small scale cocoa farmers remain poor. The need to find alternative livelihood support to alleviate poverty among cocoa producers has been a major concern for development partners and Governments of Ghana. Agricultural extension education systems aim at improving the livelihood of small scale farmers through the use of appropriate extension methodologies. Value chain approach has been proposed to address problems from production, processing, marketing and consumer perspectives. Specific extension methodologies to reduce poverty among cocoa farmers along the value chain have not been tried and tested in Ghana hence the study.

**Purpose and Objectives**
The paper presents results of an extension action research oriented methodology that developed a cocoa pulp juice value chain for production of alcohol to alleviate poverty among farmers at Akuako community in Eastern Region of Ghana. Specifically, the paper: describes the action research process to determine the appropriate income generating project for poverty alleviation; analyses the profitability of project and shares information on measures put in place to sustain the project.

**Methods and/or Data Sources; or Theoretical/Philosophical Themes**
The research was conducted within the framework of action research which is a self-
reflection inquiry undertaken by practitioners to improve the rationality, understanding, and situations in which the practices are carried out. The action research (proposed by Kervin Lewin who is generally regarded as the father of action research) is a six iterative process namely: analysis, fact-finding, conceptualization, planning, implementation of action, and evaluation. The stages had been summarized into four-step approach namely: (1) Planning, (2) Acting (3) Observing, and (4) Reflecting. In conducting the action research, the study adopted needs analysis, group discussions, group meeting, method demonstration and use of resource persons to identify, analyse, implement, solve and evaluate the problem with farmers. A mini distillation (fermentation, boiling, evaporation and condensation) experiment was set up to determine the yield of alcohol from a known quantity of pulp juice. Interview schedules, observation and group discussion were used to collect data on the demographic characteristics of the group such as age, sex distribution as well as educational background and attendance to meetings. A simple gross margin analysis was done to determine the profit margin of the product.

**Results, Products, and/or Conclusions**

The need analysis of action research method revealed farmers required alternate sources of income to combat poverty. The cocoa pulp juice which goes waste during fermentation of cocoa beans can be processed into alcohol for use by Crop Research Institute of Ghana (CRIQ) located in the same region as the Akuako community was identified as a priority. However, farmers lacked knowledge and resources for collection and processing of pulp juice into alcohol. A 50 member farmer group made up of 20 females and 30 males was therefore formed. Through group discussion and meetings, farmers devised means to collect, store and ferment juice at a central point. Resource persons assisted farmers to set a simple distiller to process juice into alcohol. A total quantity of 11,441 litres of pulp juice was collected to produce 500 litres of alcohol. The gross margin analysis revealed a net margin of GHS 1,092.12 from production 500 litres of alcohol.

A management system consisting of farmers and CRIQ was set up. The management negotiated for the price per gallon of product. It was responsible for identifying, anticipating and satisfying customer requirements to ensure profitability of production of alcohol. Furthermore, it was responsible for transportation of alcohol to CRIG and creating of central points for collection of cocoa pulp juice.

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

The education importance is that application of action research along the value chain can lead to identification and development of projects that can generate income to reduce poverty among farmers. It can also lead to development of lifelong learning linkages to the benefit producers and sustainability of projects.

The study recommends among other that, group approach should be used for training on collection and production of alcohol from cocoa pulp juice. Awareness was created among farmers, CRIQ and Ministry of agriculture on the need to produce alcohol from cocoa pulp juice since it is a profitable venture.

**References**


Communication Strategies for Post-Secondary Agriculture Student Recruitment in Bangladesh

Bo/David Williford
Graduate Assistant
University of Arkansas
Agricultural Education, Communications and Technology (AECT) Department
205 Agriculture Building
Fayetteville, AR 72701
(936) 212-2370 Phone
bwillifo@uark.edu

Leslie D. Edgar
University of Arkansas
Agricultural Education, Communications and Technology (AECT) Department
205 Agriculture Building
Fayetteville, AR 72701
(479) 575-6770 Phone/ (479) 575-2610 Fax
ledgar@uark.edu

Keywords: Agricultural Education, Bangladesh Education, Educational Determinants, Global Agricultural Education, International Recruitment, Post-secondary Education

Introduction

“Education is often the most valuable asset for rural people to pursue opportunities in agriculture, obtained skilled jobs, start businesses in the rural nonfarm economy and migrate successfully” (Agriculture for Development, 2008, p. 9). Investing in education leads to higher rates of return that far outweigh the initial investment (Alam, 2008). The people of Bangladesh need to be trained in technical, technological and vocational professions (Alam, 2008). Agricultural Training Institutes (ATIs) are institutions put in place to train students in these areas of agriculture. However, according to Dr. Md. Shohidullah Miah, coordinator of Agricultural Sciences at the International University of Business, Agriculture and Technology (IUBAT), IUBAT is the only post-secondary institution in Bangladesh that accepts ATI diploma holders for higher study (personal communication, September 9, 2015). An important component of higher education is recruitment; this is also true for Bangladesh. To better address the educational needs of rural communities in Bangladesh, it is important for IUBAT to recruit more students from ATIs. Recruitment involves effective forms of communications. Therefore, Berlo’s (1960) Process of Communication served as the guide for this study. In addition, Bandura’s (1989) social cognitive theory served as a framework to understanding the cognitive process of information exchange prior to enrolling as a student at IUBAT.

Purpose and Objectives

The purpose of this study was to describe the influences affecting an ATI student’s decision to enroll in courses at IUBAT in Dhaka, Bangladesh. Through this assessment, researchers sought to identify: (a) reflective factors influencing the motivation to apply for admissions, (b) information sources, and (c) guidance factors.
Methodology

Researchers in this study conducted face-to-face interviews with 20 previous ATI students who were currently enrolled at IUBAT, during March 2015. Sampling was determined based on convenience (Bryman, 2012). Convenience sampling is defined as a reliance on participants who are readily available and accessible to the researcher and is used in both quantitative and qualitative research studies (Abrams, 2010). Researchers interviewed students who: (a) held a diploma from an ATI and (b) were studying agriculture at IUBAT during the time of this study. Recruiters were asked to provide a variety of classifications (year in school, gender, etc.) to recruit students for the interviews. Prior to interviewing the students’, a script was produced for an interviewer guide. The script was developed using Berlo’s (1960) Model of Communication. This model listed 20 factors influencing encoding and decoding messages. The interviews were structured to yield answers that provided thick, rich description about the application and enrollment process (Lincoln & Guba, 1985). Interviews lasted between 10 and 30 minutes, with the average interview of approximately 16 minutes. The interviews were filmed, transcribed, and then coded (Creswell, 1999). Primary themes were grouped together which led to key emergent themes.

Findings

Three key themes emerged from the interviews: (a) Recruitment Determinants, (b) Opportunities and Benefits, (c) Barriers to Enrollment. Recruitment Determinants included the channels and messages that guided the students’ perception of the university. The overwhelming majority of respondents were recruited primarily through word-of-mouth recruitment. Many students reported being recruited at their ATI or by ATI students or faculty. A noteworthy finding was that students were frustrated that the only university that could admit ATI graduates was IUBAT. Opportunities and Benefits emerged as a theme as students expressed why they valued the opportunity that IUBAT had provided. Most students mentioned the benefit of English fluency as a positive to attending IUBAT. Students believed English to be the international first language and placed great value on the skill. In addition, students noted that learning to dress formally was expected to impact their life greatly. Job placement elevation was another benefit that was identified. Barriers to Enrollment was the third emergent theme. Students noted that many of their peers experienced or perceived barriers to furthering their education. Cost was the most predominate and inconsistencies with the IUBAT financial waiver system was causing many students to drop out of the university. Last, several students noted that although they believed fluency in English to be a benefit, their peers struggled with the material or were afraid to enroll because of the requirement to speak in English.

Conclusions and Recommendations

These findings illustrate a lack of connectedness between IUBAT in the capital city and youth at rural ATIs. Rural students often times were unaware of IUBAT or struggled to find information about the university. The fact that IUBAT was their only choice was a significant determinant in their admission. The number of accreditation questions asked about IUBAT during the recruitment process causes researchers to question if there is a public perception issue of higher education in general in Bangladesh. Furthermore, as one student stated, the lack of cohesive curriculum requirements forced many IUBAT graduates to leave the nation for study beyond a Bachelor’s of Science. Building this alignment is one of the objectives of Winrock International (2014), an aid organization in Bangladesh.
Current IUBAT students observed two key barriers to recruiting rural youth: English and costs. Interestingly, students believed English to be a barrier and an opportunity. Success stories continued to be told throughout the interview of how English had developed them into an internationally capable employee; however, many students cited English as the barrier to entry by students from ATIs and to current students who could not keep their grades at the necessary level to meet the standard of the financial waiver. The financial waiver system provides opportunity for study, as it is flexible and changing. Financial aid is a subject that has been studied for years in the United States by economists and educators. IUBAT also struggles to meet the needs of a largely impoverished population. Added awareness of these problems in the research community will continue to identify functions that are needed to support the development of both agriculture and education in Bangladesh. Although education reforms were touted in the 1960s, little has been done to improve agricultural education in Bangladesh (Swanson, 1966).

References
Comparison of United States and Latin American Undergraduate Students’ Understanding, Attitudes and Perceptions of International Agricultural Issues and Engagement as Global Citizens

Sarahi Morales
Department of Agricultural Education and Communications
Texas Tech University
Lubbock, Texas 79409-2131
P: (806) 742-2816
F: (806) 742-2880
Todd.brashears@ttu.edu

Todd Brashears
Cindy Akers
Jaime Malaga
Gary Wingenbach

Keywords: International Agricultural Issues, Global Citizenship, Knowledge, Undergraduate Education

Introduction
The interaction between globalization and agriculture continues to increase as interrelations between countries and regions grow. Therefore, it is not surprising agribusinesses’ expect college and universities students to be prepared to be globally competent in their fields (Whigham & Acker, 2003). In addition, current world pressing issues have led countries, business leaders, and educators to discuss the need for schools designed to meet the needs of globalization and prepare students for international work (Spring, 2008; Olson & Evans, 2007).

The most effective way to incorporate a global component to undergraduate studies is through study abroad programs (Brooks, Frick, & Bruening, 2006). However, only 1 percent of students majoring in agricultural sciences participated in study abroad programs during the 2011-2012 academic year, similar to previous years (Institute of International Education, 2014). Additionally, a higher emphasis has been placed on global citizenship education which aims to engage students in the understanding and resolution of issues worldwide (The United Nations Educational, Scientific and Cultural Organization [UNESCO], 2013). Therefore, academic institutions and their faculty members must take a proactive role to effectively teach students how to contribute to the solution of issues around the world (Bruening & Shao, 2005).

This study is based on the Theory of Planned Behavior by Ajzen, which explains “individuals’ intentions to perform a given behavior” (Ajzen, 1985, p. 181); in addition is supported by the theory of human capital, which indicates “that individuals and society derive economic benefits from investments in people” (Sweetland, 1996, p. 341).
Purpose and Objectives

The purpose of this study was to compare United States (U.S.) and Latin American (L.A.) undergraduate students’ knowledge, attitudes, and beliefs toward international agricultural issues and their attitudes to engage in society as global citizens. The following research objectives guided this study:

1. Describe students enrolled in agricultural sciences.
2. Assess students’ knowledge of international agricultural issues.
3. Determine students’ attitudes regarding international agricultural issues.
4. Determine students’ beliefs about international agricultural issues.
5. Assess students’ attitudes toward global citizenship.
6. Establish the relationship between students’ global citizenship and the students’ university of enrollment, gender, and their knowledge, attitudes, and beliefs about international agricultural issues.

Methodology

The research design for this study was causal – comparative, which is used to identify cause and effect relations (Gall, Gall, & Borg, 2007).

The researcher use modified versions of the International Agricultural Awareness and Understanding instrument developed by Wingenbach et al. (2003) and Hurst (2013), and the Global Citizenship Scale by Morais and Ogden (2011). The final instrument consisted of 91 items including a demographic section developed by the researcher. A pilot test was conducted by the researcher to assess the internal consistency and compared to reported reliability coefficients by the instruments authors and other researchers. A post-hoc reliability analysis was conducted by the researcher.

A non-probabilistic convenience over-sample of students in classes was taken. The researcher over-sampled the population following the recommendations by Bartlett, Kotrlik, and Higgins (2001). Data collection procedures were specific to the sub-sets of the targeted populations; nonetheless general procedures were established to maintain as much consistency as possible between the groups. A total of 1,218 instruments were considered valid for this research study. The descriptive statistics, independent \( t \)-tests, and a stepwise multiple linear regression were used to describe and assess the students’ scores. An alpha level of .05 for significance was established \textit{a priori}.

Results

Overall, students’ results indicated a lacking knowledge, with only 3.6% of the sample obtaining a passing score above 60%. Regarding the students’ attitudinal conditions, students reported positive attitudes and beliefs of international agricultural issues but have mixed feelings regarding global citizenship attitudes. Nonetheless, scores on all constructs were found to be significantly different between Texas Tech University and Zamorano University (\( p < .05 \)). The stepwise multiple linear regression indicated the predictors of university of enrollment, and students’ attitudes and beliefs of international agricultural issues were significantly related to the students’ global citizenship attitudes, \( F (3, 1194) = 83.04, p = .01 \); explaining 17% of the variance in the model. The dependent variables of knowledge and gender were excluded as their contribution was minimal.


**Recommendations - Implications**

The results obtained in this research study should be considered with caution and should not be generalized to other populations as non-random assignment procedures were used; however, these results describe the targeted populations well. The positive attitudes and beliefs found in this study may be effectively increasing and strengthening students’ open-minded attitudes, allowing them to become comfortable in global settings, and even more importantly, aware of international agricultural issues but their knowledge was found to be deficient in this area. These findings suggest that students at both academic institutions may not be connecting the learned information in classes to an international context, as suggested by Wingenbach et al. in 2003. Global citizenship attitudes were found to be toward the mid-point of the scale, suggesting that students may not fully understand and exhibit the behaviors of global citizenship as prescribed by Morais and Ogden (2011).

These results imply attitudes and beliefs toward international agricultural issues do explain 17% of the variance in the students’ intentions to engage as global citizens. Knowledge of international agricultural issues was found to make minimal contributions to the students’ intentions. This partially supports what researchers have suggested regarding global citizenship and future behaviors (Reysen & Katzarska, 2013; Carabain, Keulemans, Van Gent, & Spitz, 2012). In addition, students’ university of enrollment was found to contribute to the students’ intentions to behave as global citizens to solve international agricultural issues.

It is recommended to deepen student knowledge and global citizenship attitudes by emphasizing the actions and activities among students to infuse international dimensions into the students’ curriculum and experience in college. It is suggested to explore suggestion made by scholars over the years (Brooks et al., 2006; Navarro, 2004; Whigham & Acker, 2003; Radhakrishna & Dominguez, 1999).

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Competence Theory, Research and Practice. A Synthesis

Martin Mulder, PhD
Head chair group of Education and Competence Studies
Wageningen University
Social Sciences Group – bode 68
PO Box 8130
NL-6700 EW Wageningen
Hollandseweg 1
6706 KN Wageningen
Netherlands
Phone: + 31 317 48 41 81; Fax: + 31 317 48 45 73
Mobile: + 31 6 20 677 340
Email: martin.mulder@wur.nl
Internet: www.ecs.wur.nl
Internet: www.mmulder.nl

Keywords: Competence, competency, theory, research, synthesis

Introduction

Competence-based education, extension and management practices exist now for several decades (author, 2014). However, there have been heated discussions about the value of competence-based initiatives, ranging from straight advocates of this approach to negative critics who strongly suggested abolishing competence-approaches of practice (e.g. Westera, 2001).

After the pre-scientific use of the concept of competence in the literature (e.g. by Dewey, 1916), it was White (1959) who introduced competence as an academic construct. The concept was taken up quickly by many, who, for various reasons, believed that competence-based professional practice would yield great results for the alignment of education and society, performance improvement in organizations, personnel selection and placement and life-long learning.

Purpose and Objectives

The purpose of this paper is to review the literature on competence-based practice. Since competence-based initiatives in education, extension and management have been taken since the 1950s, multiple interpretations emerged of the notion of competence, and some critics have stated the construct is completely obsolete (author, 2014). Nevertheless, competence-based approaches to education, extension and management have been quite persistent and manifested themselves at different times at different places around the globe. These initiatives may have been contributing to more effective performance management and desired socio-economic results, but they may also have been a gross failure.

Questions which will be addressed in this paper are: 1. What are the dimensions of the competence construct? 2. What theoretical approaches can be distinguished? 3. What are the arguments against competence approaches? 4. To what extent are critical comments (still) valid? 5. What research results are known about the impact of competence-based practices?
Method
The method used is an interpretative analysis of the literature published on competence theory, research and practice. It builds on a longitudinal research programme which is being implemented from 1998 – 2017, series of publications and PhD completions during the years 2000-2015.

Results
The results of this study are that there is a broader overview and deeper insight into the questions which were raised. The results will be presented in the order of the questions.

What are the dimensions of the competence construct?
There are many different dimensions of the construct mentioned in the literature. Based on the extensive overview of the literature the following is suggested. Competence is seen as a set of learnable context-specific performance requirements. Competencies are clusters of knowledge, skills and attitudes related to meaningful units of professional practice. Competence is a driver of learning and a valid predictor of performance (McClelland, 1973; Bartram, 2005). Competence is regarded as being synonymous with capability, graduate attributes and professional expertise. The highest level of competence is excellence. Over-specification of competencies should be avoided, and competence itself can only be inferred by performance assessments.

What theoretical approaches can be distinguished?
Basically there are three theoretical approaches which can be distinguished: 1. functional behaviourism (as reviewed by Barrick, 2015), 2. integrated occupationalism (as conceptualized by Wesselink, 2010; Hager, 2015), and 3. situated professionalism (as introduced by Lave and Wenger, 1991), all based on different epistemologies, as recently reviewed by Bagnall and Hodge (2015.) These theoretical approaches will be elaborated further and evaluated in the paper. As a tentative conclusion it is contended here that high-quality competence-based approaches can be and are based on a multidimensional set of philosophies of education.

What are the arguments against competence approaches?
There are quite different arguments against competence approaches, some of which are meant to be fundamental (Lum, 1999; Westera, 2001; Hyland, 2006; author et al, 2007). Most critics question the opaque definition of the construct of competence. Lum (op cit) stated that using competence as the goal of education is an empty platitude, that a generic notion of competence cannot differentiate between competence-based and non-competence-based education, that it cannot specify curriculum design and assessment practice, that an insufficient distinction is being made between competence as aim and a competence-based education strategy, that there is no evidence of a causal relationship between competence as aim and strategy, that the need to emphasise ‘learning to do’ in workforce education is incontrovertible and that in essence desired outcomes cannot be precisely formulated.

To what extent are critical comments (still) valid?
Since the review of the critical literature of Hager (2015) it is clear that criticism on the competence-approach is context-related. Much criticism came for the United Kingdom, and is related to the problematic implementation of the national vocational qualifications framework.
The critical analysis of Lum (op cit) was cited by many, but currently, desired outcomes of CBE are defined in competence frameworks, therefore, competence as the goal of education is not an empty platitude. There are operational strategies for CBE curriculum design and authentic assessment now. So, the distinction between competence as aim and a competence-based education strategy is operational, which implies a causal relationship between competence as aim and the CBE strategy. Clearly, competence-based and non-competence-based practice can be distinguished.

**What research results are known about the impact of competence-based practices?**

Despite the enormous amount of literature on competence-based practices, both in education and human resources management, there is surprisingly little empirical evidence of its effects. In a recent study, Lassnigg (2015) had made a review of the effectiveness of competence-based education, and he found hardly any evidence for the effectiveness of competence-based education. There was no study found which compared competence-based learning with other forms of learning. The same holds to a certain extent for competence-based extension and management practices.

**Recommendations**

Two major recommendations can be formulated based on this study. 1. There is a great need to synthesize the literature on competence theory, research and practice. This study is a first attempt to achieve that. 2. It is high time that further research will be done on the effectiveness of competence-based practices for the educational achievement and human development.

**References**


Author (2014).


Developing an Understanding of Barriers to ICT Use: Caribbean Extension Officer’s ICT Use, Acceptance, and Self-Efficacy

Jeet Ramjattan  
Graduate Student, Department of Agricultural Economics and Extension  
Faculty of Food and Agriculture  
University of the West Indies, St Augustine, Trinidad  
jeetramjattan@gmail.com  
1 868 685 9250

Wayne G. Ganpat  
Department of Agricultural Economics and Extension  
Faculty of Food and Agriculture  
University of the West Indies, St Augustine, Trinidad

Robert Strong Jr  
Department of Agricultural Leadership, Education, and Communications  
Texas A&M University

Keywords: ICTs, extension officers, Unified Theory of the Acceptance and Use of Technology

Introduction and Theoretical Framework

Information Communication Technologies (ICTs) include hardware and software associated with desktop, laptop, and tablet computers, cellular and land-line telephones, radio towers, televisions, DVD players and more (McCole, Culbertson, Suvedi, & McNamara, 2014). The advantages of ICTs enable extension officers to respond to audiences faster, disseminate information to larger audiences, and save travel time and expenditures (Ganpat, Webster, & Narine, 2014). Strong, Ganpat, Harder, Irby, and Lindner (2014) suggested future research should examine new extension officers’ capacity for using ICT’s.

The theories utilized to frame this study were Venkatesh, Morris, Davis, and Davis’ (2003) Unified Theory on the Acceptance and Use of Technology (UTAUT) and Bandura’s (1991) self-efficacy. The UTAUT is a method of assessing the likelihood of success for new technology introductions and enhances the understanding of what drives acceptance of technologies. The four constructs of the UTAUT are performance expectancy, effort expectancy, institutional support, and social influence (Venkatesh et al., 2003). Self-efficacy is an individual’s belief in their personal capabilities and access to sufficient resources to accomplish a given task (Bandura, 1991).

Purpose and Objectives

This study was a part of a larger study seeking to understand barriers that prohibit new extension officers from using ICTs. Performance expectancy and effort expectancy are not provided here. More specifically, this study sought to:

1. Describe total ICT use by new extension officers;
2. Describe participant’s institutional support to access ICTs for their extension work;
3. Describe participant’s social influence impacting ICT use; and
4. Describe participant’s self-efficacy with using ICTs as extension officers.
Methodology

Sixty-two ($N = 62$) new extension agents in the North and South Extension services of Trinidad, the Extension Training and Information Services and the Tobago Division of Agriculture, State assisted organizations and private extension service providers across the country were targeted during March to May 2015 using self-reporting questionnaires. The survey was conducted on a weekly basis on the mandatory office days of the agents and fifty-seven ($n = 57$) officers participated; yielding a 92% response rate. The reliability coefficients for institutional support was .89, social influence .86, and self-efficacy .93.

The survey instrument captured comprised four sections: seventeen demographic and job characteristics questions, level of access to twelve ICT tools (which included devices and applications, cellular phones, computer and network hardware and software, internet, websites, satellite GPS etc.), thirteen questions to assess level of institutional support, and eighteen questions to assess social influence on ICT use. The instrument was examined for content validity by a panel of six experts in the field of extension and edited according to the recommendations and feedback given before final approval. Descriptive statistics using means and standard deviations were used to describe the study population.

Findings and Conclusions

Most respondents were employed by the Public extension service (95%) and were Agricultural Assistants I (82%) while 14% and 4% were Agricultural Extension Aides (AEAs) and Agricultural Officers (AOs) respectively. With respect to education, 30% possessed associate degrees, 25% had an undergraduate degree, 22% completed postgraduate degrees and 14% had only a post-secondary degree. Most officers had 1-5 years of working experience (63%) while 33% and 4% had less than 1 year and 6-10 years’ experience respectively. Similarly, most were between the ages of 18-30 years (77%) and 49% were males. Most officers specialized in extension (49%) and crop production (37%) while a minority had expertise in livestock production (12%) and administrative services (2%). The sample majority earned $TT (Trinidad Dollars) 5,000 to $7,000 (88%).

The majority of new extension officers (81%) reported using some level of ICTs in their work. The main ICTs that were perceived very useful were cellphones (86%), presentation software (70%) and emails (25%). The least useful ICT to extension officers were GPS technologies. Access to specific ICTs was not a challenge. Respondents reported a moderate level of access to computer hardware (printer, scanner and projector), the Internet, and computers.

In regards to institutional support, the majority ($n = 38, 67\%)$ of respondents reported that administrators understand the importance of using up to date technology in conducting extension work. Thirty-two ($n = 32, 56.14\%)$ respondents indicated administrators gave sufficient support for programs which involve new extension methods. However, respondents reported that lack of proper facilities existed for the use of new extension ICTs and that there were inadequate financial support and approval from administrators to conduct programs using ICTs.

The social influence construct had some level of importance on ICT use. Most respondents indicated that social influence had a significant ($p < .05$) impact on their use of computers, cell phones and the Internet. The ICTs with the least social influence impact were use of mobile apps, web based apps, and GPS technology.

In regards to self-efficacy, most ICT issues created moderate level of difficulty for extension officers. Most items had some positive influence on respondents’ use of ICTs (Overall
Respondents were most comfortable in using ICTs for evaluation purposes and to promote alternative/additional information to clarify confusion among clients. However, respondents were least comfortable responding to clients’ questions using ICTs.

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

Future studies should examine farmer’s ICT use and evaluate knowledge farmer’s gained through ICT use. Perpetual assessments of extension officers’ ICT use is important. New extension officers need to be updated on ICT tools (McCole et al., 2014) on a regular basis and new ICTs should be made available to help extension officers achieve peak performance (Venkatesh et al., 2003).

This study underscored the importance of training extension officers to use ICTs given job demands, and thus, to help job retention and reach larger audiences faster. Training would enhance new extension officer’s self-efficacy (Bandura, 1991) with ICTs and enable extension officers to use (Venkatesh et al., 2003) ICTs more to reach larger audiences in a shorter amount of time (Ganpat et al., 2014; Strong et al., 2014). ICT trainings could be offered by the Ministry of Agriculture, faculty at local Caribbean institutions studying ICT use, and faculty teaching with ICTs around the world.

**References**


Developing Emotionally Engaged Thinking in International Contexts: Addressing Adaptive Issues through the FACE Approach

Anthony C. Andenoro
University of Florida
PO Box 110540
Gainesville, FL 32611-2060
andenoro@ufl.edu

Nicole L. P. Stedman
University of Florida

Introduction

Over the last five years, there has been a growing emphasis on grand challenges. Several organizations such as the Gates Foundation, United Nations Development Programme, the White House, USAID, and many others call for the development of solutions to meet the issues inherent within these grand challenges. Examples of grand challenges include, but are not limited to climate change, food security, and the AIDS pandemic. These challenges are complex in nature, requiring different forms of problem solving and leadership within local, state, national, and international contexts. However, in order for leaders to address this level of action they must be equipped to synthesize and bring together ideas from a variety of perspectives. This creates the impetus for redefining how we approach the development of extension professionals and asks, “how can we ensure that extension agents and community leaders are prepared to meet the complex growing needs of our global communities?”

This presentation provides an innovative and groundbreaking opportunity to explore the idea of Emotionally Engaged Thinking (Stedman & Andenoro, 2015) a cornerstone for shifting the leadership paradigms and behaviors and addressing our most pressing global challenges.

The power of Emotionally Engaged Thinking (EET) as a tool for creating more holistic decision-making and Emotionally Engaged Leadership. Through the use of the FACE Method (2015) participants will address complex adaptive challenges and learn the process for replicating this with their learners in their local, state, national, and international communities. The following learning objectives set the foundation for the presentation.

As a result of this presentation participants will:
1) Experience and develop an understanding for the facilitation of the FACE Method
2) Understand the theoretical framework and contextual application of the FACE Method with respect to Emotionally Engaged Thinking (EET)
3) Identify the role of EET within a decision-making framework
4) Contextualize Emotionally Engaged Leadership within organizational and community development contexts

Review of the Literature

In the past, humanity has relied on technology and science to sustain their way of life in times of adversity. However, while technology and science may play a role in how we save our planet, our grand challenge of population growth requires something much greater – massive social and behavioral changes in global populations. This complex adaptive challenge exemplifies the charge and original impetus behind complex adaptive leadership (Heifetz,
Grashow, & Linsky, 2009a, 2009b; Lichtenstien, Uhl-Bien, Marion, Seers, & Orton, 2006; Yukl & Mashud, 2010).

Complex adaptive leadership recognizes that problems are complicated and influenced by various systems replete with countless interactions. This systems perspective provides an expanded view of interconnectedness of the problems we face. It brings leadership from an individual perspective to a social perspective; whereby leaders must work together to achieve great things. Leadership resides within the frameworks of the system; it is interactive and dynamic (Lichtenstien, Uhl-Bien, Seers, Douglas Orton, & Schreiber, 2006).

The greatest benefit of this social perspective of leadership is increases in creativity, influence, and change (Lichtenstien, Uhl-Bien, Seers, Douglas Orton, & Schreiber, 2006). When each individual can contribute to the leadership whole there is greater ownership, whereby the formal leaders become less concerned with the right answers and more concerned with the right strategies.

Emotionally Engaged Thinking as the Leadership & Community Development Solution

Emotionally Engaged Thinking (EET) was developed from research conducted more than a decade ago, which linked critical thinking and emotional intelligence. This link provided the foundation for how people can use emotion to guide logic. In 2013, Stedman and Andenoro launched Emotionally Engaged Thinking after refining this connection. Andenoro identified Emotionally Engaged Thinking as a critical piece of the solution building process during his TED talk (2014). Further he noted that Emotionally Engaged Thinking creates a foundation for solving our world’s greatest challenges including global population growth, international food security, transnational pandemics, and beyond (2014). Emotionally Engaged Thinking approaches decision-making using the foundational work in neuroscience to address the use of emotions in a leader’s ability to think critically.

EET promotes a systems thinking approach that incorporates emotions as the catalyst for positive decision-making. Emotionally engaged thinking is applicable across the spectrum of disciplines, industries, and natural resource areas. The intent of EET is that all individuals involved in decision making (not just the leader) have some level of emotional investment in challenges and problems facing their particular field. By engaging in EET all invested parties can actively express their emotions and participate in active dialogue. Using the FACE Method, (Foundational awareness, Authentic engagement, Connective analysis, and Empowerment and change) individuals are provided the tools to think through problems, recognizing their emotion, engaging in dialogue, and promoting shared decision making. In order to capture this the example of food security will be used as it evokes a number of human variables (emotion, cognitive, and behavioral).

Discussion Outcomes & Presentation Implications

To date, findings have indicated that there is tremendous benefit to learners engaging in the FACE Approach (Andenoro, Bigham, & Balser, 2014). Specifically, findings illustrate that learners show elevated levels of adaptive leadership capacity (inclusive of self-awareness, intercultural competence, desire for and understanding of collaboration, effective communication, and internal locus of control), systems thinking, and socially responsible agency (2014). This is currently being applied in corporate, higher education, governmental agency, and community development contexts that will provide additional data at the time of presentation. We fully expect participant’ outcomes to align with our previous findings and create a foundation for implementing this instructional methodology with the learners they serve.
Through this innovative approach, leadership and extension educators can go beyond the traditional educational methods of “open head, dump in knowledge” and explore new areas of learning immersed in affective shifts and behavioral changes. The approach serves as a powerful tool, equipping leadership learners with social science capacities and dispositions, which can be applied in complex adaptive ways to seemingly technical and linear problems. This integrated approach allows for system thinking connections to be made by learners, creating the potential to lead to sustainable outcomes and leadership solutions that have far reaching implications for our world.

References


Diversifying Enrollments in Colleges of Agriculture: Examining the Motivations of Latino Students to Pursue Agricultural Degrees

Dr. Joy Morgan
North Carolina State University
Ricks Hall 216, Box 7607
North Carolina State University
Raleigh, NC 27695
(919) 515-6077
jemorga2@ncsu.edu

Dr. Wendy Warner
North Carolina State University

Dr. Travis Park
North Carolina State University

Keywords: Latino, Hispanic, Motivations, Agriculture, Careers

Introduction
The United States is a melting pot of different countries, races, and religions hoping to find new opportunities (Millet, 2011). The Latino/Hispanic population is growing rapidly and more so than any other cultural group, becoming the largest minority population (United States Department of Labor, 2012). Castellanos and Jones (2003) stated that multiculturalism and multiracialism was key to the future of American higher education of the nation. Latinos can provide benefits to industries and companies competing in a global market because of their bilingual and multicultural competencies and awareness (Leary, 2000).

However, education, especially post-secondary education, is critical for success in nearly all career fields. Access to and engagement with higher education continues to prove challenging for Hispanics. According to the United States Department of Labor, Hispanics age 25 and older were less likely to have graduated from high school when compared to whites, and the proportion with a bachelor’s degree was much lower for Hispanics than for Whites (United States Department of Labor, 2012).

At (State) University, 4.3% of incoming freshman classified themselves as Hispanic/Latino, contributing to only 16.4% of the total student population. In the College of Agriculture and Life Sciences (CALS), Latino students make up approximately 4% of the population (<State>, 2012). Clearly, Hispanic/Latino students are enrolling in both the university and CALS at a much lower rate than their proportion of the population would suggest. With a stated need for the preparation of Latinos to enter the workforce (Leary, 2000), faculty and administrators must find answers to increase Hispanic/Latino enrollments.

Theoretical Framework/ Review of Literature
Vroom’s (1964) expectancy theory states a person will choose a certain behavior based on their motivations and the desired outcome. By understanding Hispanic students’ desires and beliefs related to agricultural related degrees, as well as their self-efficacy towards completing the degree program, educators may be able to improve efforts for recruitment, retention, and
graduation. In addition, by examining the internal and external factors that contribute to each variable within the expectancy theory, educators can identify factors that might help or hinder Latino students desire to pursue and complete an agricultural degree.

Because much of the manual farm labor in the United States is completed by the Latino/Hispanic population, many would assume that few would choose to seek higher education degrees in the agricultural field. A study focused on Latino views of agriculture conducted by Mullinix et al. (2003) indicated Latinos saw many career opportunities in the agricultural sector and parents would encourage their children to pursue agricultural careers. Additional research has examined Latino students’ experiences in higher education. Findings suggested that faculty and family relationships, as well as the desire to succeed played an important role in retention and graduation (Hernandez, 2000). Similarly, Jones and Larke (2001) and McCartney et al. (2012) found a strong emphasis on the importance of family in career decisions.

**Purpose and Objectives**

The purpose of this study was to determine specific motivations and influences encouraging Latino students to pursue a degree in an agricultural field. Research objectives included:

1. Explore why Hispanic/Latino students choose agriculture related majors.
2. Examine specific motivations and influences that impacted student’s major.
3. Determine participant’s attitude toward agriculture.

**Methodology**

A qualitative approach was used to gain in-depth understanding of motivations and influences of Latino students to pursue an agricultural career. A purposive sampling technique was used to identify participants that were CALS students and children of migrant farm workers.

Semi-structured interviews were voice-recorded and transcribed, then reviewed by the two participants to authenticate the data. Data analysis was completed using horizontalization by highlighting significant statements throughout transcriptions and assigning themes. Thirty themes emerged, and those themes were then combined into six themes, before being combined into three main themes. Organization into themes allowed lived experiences to be better described (Creswell, 2012). In addition to interviews, participants answered open-ended questions, and their responses were analyzed as a process of validating data through triangulation.

**Findings**

Qualitative studies describe the *how* and *what* of the experience to grasp the overall essence (Creswell, 2012). These two specifics for this study can be explained through three themes: (1) role of family, (2) mentor influence, and (3) desire to help others. Maria*, strongly influenced by her family and mentors, majored in Agricultural Extension to help others and promote agriculture. Jose* desired a better life and credits a scholarship donor, family, and mentors for encouraging him to achieve his dream of being a college graduate. For Jose, agriculture has been a primary influence, has allowed his family a life in the United States, and is a career field in which he can help others.

Evidence showed a positive perspective associated with agriculture. Coming from a strong agricultural background, participants’ families relied on agriculture as a primary source for income, as their fathers were employed directly within the agriculture industry. Both
participants discussed sacrifices made by parents for a better life and higher education for their children. In addition to their parents, both community and university mentors played a significant role impacting participants’ career choices. Scholarship opportunities were a major motivating factor for participants to attend the university.

Conclusions/Recommendations/Implications

This study supports previous research recognizing the strong influence of family and university faculty on the Latino student. As a result, parents should be educated to increase understanding of opportunities in the agricultural industry available for their children. In addition, students need supportive university professors and mentors. Agriculture is viewed positively and is viewed as a career to help others.

Overall, this study provided valuable insight to be used within agricultural departments to help recruit Latino students, namely working with parents and establishing mentor relationships with Hispanic/Latino students. Also, universities need to continue to seek out scholarship donors that can assist financially with preparing future generations. In order to meet the demands of a globally competitive workforce, universities must focus efforts on the recruitment of a diverse student population and promote a potential positive message about careers in agriculture.

References


Early Users’ Views on the Greenseeder® Hand Planter: Implications for Improvement and Widespread Diffusion

Lisa K. Taylor, M.A.
Oklahoma State University
460 Agricultural Hall
Stillwater, Oklahoma 74078-6032
Tel. #: 405-744-5016
lisa.k.taylor@okstate.edu

Assoumane A. Maiga, Ph.D.
Oklahoma State University

William R. Raun, Ph.D.
Oklahoma State University

M. Craig Edwards, Ph.D.
Oklahoma State University

Marshall A. Baker, Ph.D.
Oklahoma State University

Joshua J. Ringer, Ph.D.
Oklahoma State University

Keywords: adoption, food security, Greenseeder® Hand Planter

Introduction/Theoretical Framework/Review of the Literature

By 2050, the global population will exceed 9 billion people reflecting an increase of 2 billion over the current population (Lartey & Gennari, 2014). The need exists to increase agricultural and food production by 60% to meet the challenging projections for food demand (Food and Agriculture Organization [FAO] of the United Nations, 2014).

In 2012, about 870 million people could not meet their minimum dietary requirements; most were living in developing countries, i.e., more than 800 million (FAO, 2014). Lartey and Gennari (2014) identified dried cereals as “the most important food source for human consumption” (p. 6). About 61% of the world’s dried cereal is consumed in the developing world (Lartey & Gennari, 2014), including maize, wheat, rice, oats, barley, millet, sorghum, among others (FAO, 2014).

By 2025, the demand for maize in the developing world is expected to double and, therefore, it will need to become the highest producing cereal crop (Ray, Mueller, West, & Foley, 2013). The use of new technologies to increase food production is becoming more essential to ensure food security and alleviate hunger and poverty. The Greenseeder® Hand Planter was developed by researchers at Oklahoma State University to assist in overcoming this global challenge. It was designed to minimize seed and fertilizer waste during planting, increase seeding speed, and prevent incidental health risk from handling treated seed (Taylor, Raun, Wollenhaupt, & Ascencio, 2014b). Though the product can dispense a variety of seeds and
fertilizer, this study focused on its use in planting maize.

This study was guided by Rogers’ diffusion of innovation theory (2003). The researchers used this theory as a lens to understand the factors likely to impact diffusion of the Greenseeder® Hand Planter. The attributes of an innovation (relative advantage, compatibility, complexity, trialability, and observability), adopter categories, and the innovation-decision process experienced by an adopter (Rogers, 2003) guided the study. The Greenseeder® Hand Planter is an innovation designed for use by small-scale farmers to increase their cereal production efficiency (Taylor, Raun, Wollenhaupt, & Ascencio, 2014a). New ideas (innovations), such as the Greenseeder® Hand Planter, are generally perceived with uncertainty by potential adopters (Rogers, 2003). It is important, therefore, to understand factors contributing to potential adopters’ perceptions of uncertainty and ways to mitigate those views.

Purpose and Objectives

The study’s purpose was to describe the perceptions of early users of the Greenseeder® Hand Planter. The study’s findings may help in developing strategies for further improvements to and diffusion of the hand planter, and also understand factors related to its adoption or rejection. Three objectives guided the study:

1. To understand early users’ perceptions of the Greenseeder® Hand Planter;
2. To identify factors impacting the adoption or rejection of the hand planter;
3. To develop recommendations for further improvement of the hand planter.

Methods and/or Data Sources

Agriculturists who were initially trained on and given a Greenseeder® Hand Planter were contacted to participate in this study. A researcher-developed, online survey questionnaire was sent to participants in 30 different countries, including nations of Africa, Asia, Central America, Europe, South America, and the United States. The questionnaire included two parts. The first part was comprised of five major constructs, i.e., level of satisfaction, customer preferences, likelihood of referrals, product usage, and related adoption decisions. Each construct consisted of several summed-rating questions (Creswell, 2015) using five-point Likert-type scales, e.g., 1, very unsatisfied to 5, very satisfied. The second part asked about participants’ personal and professional characteristics.

The questionnaire was reviewed by a panel of experts at Oklahoma State University to ensure content validity. The survey questionnaire was administered using the online survey software Qualtrics®. SPSS® version 21 was used to analyze the data for frequencies and percentages.

Results, Products, and/or Conclusions

The 19 respondents were male and reported belonging to various agriculture-related sectors, i.e., farming (46.6%), education (30.8%), and extension (23.1%). About 23% were farm owners, 7.7% were farm managers, and 15.4% were farm workers. Most of the participants (93%) perceived they were very satisfied with the Greenseeder® Hand Planter. A large majority (83.3%) indicated they would definitely or probably continue using the hand planter. Two-thirds of the respondents perceived the hand planter was somewhat better than other planting techniques. The participants reported the hand planter presented many relative advantages (Roger, 2003) compared to other traditional planting tools, e.g., it was more convenient; it was easier to use in some soils; it reduced their workloads; and, it provided more time to do other
farming activities. Further, about two-thirds of the respondents indicated they would **definitely** recommend the hand planter to other farmers. The respondents also perceived the planter’s user manual was easy to understand. More than one-half of the early users agreed that using the hand planter contributed to increasing cereal production.

It was concluded that users perceived the Greenseeder® Hand Planter presented several essential relative advantages (Rogers, 2003) compared to their traditional planting techniques. Moreover, it was an easy and simple tool to use without much training, i.e., the participants perceived **low complexity** (Rogers, 2003) while increasing their yields. The users, however, did express some concerns and offered recommendations regarding modifications of the hand planter. For example, “[m]y experience was that the hole for dropping the seed was easily getting blocked when used in wet conditions.” Pending additional improvements, this tool, if adopted, is likely to increase the yield of maize and other crops in developing countries, and therefore, contribute to reducing food insecurity (Taylor et al., 2014b).

**Recommendations and Implications**

The study showed that even though most of the respondents were likely to continue their use of the Greenseeder® Hand Planter, some perceived the need for technical and mechanical improvements or corrections. For example, the hand planter should dispense both seeds and fertilizers; be suitable for no-till environments; should be packaged with extra drums matching different crop needs; and be made more affordable for farmers in developing countries.

**References**


Empirical evidence for the use of improved seed yam (*Dioscorea* spp.) technology by farmers in Cameroon

Valentine P. Nchinda
UNE Business School,
University of New England,
Armidale-NSW, Australia
vnchinda@une.edu.au/nchinda.valentine@gmail.com;
Telephone: (+61) 2 6773 3921

David Hadley

Rene A. Villano

Emilio Morales

**Keywords:** minisett technology, adoption, intensity and determinants, Cameroon

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

In order to address problems of food insecurity in Cameroon, the government introduced the minisett technology to yam farmers in the country; through the National Agricultural Extension and Research Programs (PNVRA) and the National Roots and Tubers Development Program (PNDRT) (IITA, 2005; Otoo, Okoli, & Ilona, 2001). The minisett technology consists of using healthy ware yams to produce high quality or “clean” seeds (Ajaga, Lyonga, Whyte, & Tumanteh, 1987; Igwilo, 2007; Otoo et al., 2001; RIU, 2009) at economically viable rates (Ezeh, 1992). Yam farmers in Cameroon were expected to adopt and use the technology in order to increase yam yields (Arenga & Ousmane, 2009) and raise additional income for livelihood improvement and poverty alleviation (Mendola, 2007).

**Purpose and objectives**

This paper assesses the intensity (extent) of adoption or use of improved seed yam (minisett) technology by farmers in Cameroon as well as the determinants of the decisions to adopt the technology. It is hypothesized that socioeconomic factors account for the very low level or extent of use of improved seed yam technology in Cameroon. In contrast to Nchinda et al. (2010), it is hypothesized that the decision to adopt and the extent of use of seed yam technology do not have same determinants.

Oladele and Kareem (2003) advocate for the regular assessment of adoption intensity in order to improve the efficiency of agricultural technologies. Consequently, the findings of this study will be relevant for policy makers, in terms of scaling up of the adoption and intensification of use of the minisett technology with consequent prospects for tripling yam yields (Manyong et al., 2008), reducing the cost of planting materials (Acquah & Evange, 1994), addressing problems of food insecurity and improving rural livelihoods (Douglas & Mackay, 2003; Ian, 2009).

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

*Data source*
The study was carried out in the North West Region of Cameroon where the minisett technique has been disseminated since the mid-1980s. The analyses uses data from 274 randomly selected yam farmers who were trained on how to use the technology and are either adopters (132) or non-adopters (142) of the technology in the North West Cameroon.

**Review of empirical Methods and approach adopted for the**

A variety of different empirical methodologies have been used in estimating the intensity of adoption of agricultural technologies. The Double Hurdle regression approach was used in determining the intensity of adoption of hybrid sorghum (Nichola, 1996), improved cassava in Nigeria (Awotide, Abdoulaye, Alene, & Manyong, 2014) and intensity of forage adoption in Ethiopia (Beshir, 2014). Paxton et al. (2011) used the count data estimation procedure (Poisson model) to estimate the intensity of adoption of precision agriculture technology amongst cotton farmers in the United States. The Tobit method has historically been mostly used for intensity of technology adoption studies. Fufa and Hassan (2006) used it to determine the intensity of technology (fertilizer) adoption as well as the marginal effects of the determinants on the dependent variables (adoption of fertilizer and extent of use). Chukwuji and Ogisi (2006) and Nkonya, Schroeder, and Norman (1997) have also used Tobit regression. The Tobit model has the advantage that marginal effects can be estimated that include the exogenous factors which influence both the probability of, and the intensity of, technology adoption (Chukwuji & Ogisi, 2006).

The Tobit approach has, however, recently been criticised when used to model fractional dependent variables, such as the intensity of adoption, since the parameter estimates produced may be biased (Stavrunova & Yerokhin, 2012). Firstly, the predicted values of the dependent variable (y) modelled using the Tobit method often lie outside the range [0, 1]. Secondly, the fact that the values of the dependent variable (y) are bound between the interval [0,1] indicates that the effects of the explanatory variables (x_i) are not the same in the range [0,1]. Thirdly, researchers assume a logistic form of the mean of the dependent variable (y) without testing its appropriateness or other possible alternative models. Fourth and finally, normality and homoscedasticity are assumed in a Tobit regression whereas this may not necessarily be the case (Papke & Wooldridge, 1996; Ramalho, Ramalho, & Henriques, 2010; Ramalho, Ramalho, & Murteira, 2011, 2014). Consequently, the Fractional Regression Model (FRM) is considered a better alternative method to model indices and proportional response variables in the range [0,1] (Ramalho, Ramalho, & P. Henriques, 2010). This is particularly so because it allows for Regression Equation Specification Error Test (RESET) and Generalized Goodness-Of-Functional-Form (GGOFF) test to be used, and the choice of the best-fit distributional functional model selected (Papke & Wooldridge, 1996; Ramalho et al., 2010; Ramalho et al., 2011, 2014; Ramalho & Silva, 2009). This is the empirical approach used in this paper.

**Results and Conclusions**

The results show that the probability of adoption and use of minisett could potentially be increased by 0.16. The decision to adopt the minisett technique based on the one-part loglog model and the subsequent decision about the extent of the use of the technique (two-part probit specification) were both negatively influenced by increases in labour cost and yam farm size. These decisions were not entirely influenced by the same factors. Extent of use of technology was further positively influenced by the numbers of hours of family labour input, use of fertilizers and hired labour, availability of stakes and the financial capabilities of farmers. Labour was the most
critical determinant for both the decision to adopt and extent of use.

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

Efforts to scale up the adoption and intensity of use of improved seed yam technology should target communities where affordable labour is available and where stakes are easily accessed at low or no cost. In addition to facilitating access to inorganic fertilizers, farmers should be trained in composting techniques to support the uptake of seed yam technology. Farmers should be urged to allocate more of their labour input time to seed yam production as this may reduce the costs associated with the uptake of the technology.

**References**


Evaluation of an International Entrepreneur Exchange Program: Impacts and Implications for Agricultural Development

K. S. U. Jayaratne, Ph.D.
Department of Agricultural and Extension Education
North Carolina State University
Raleigh, NC 27695-7607
Phone 919-515-6079
Jay_jayaratne@ncsu.edu

Lisa K. Taylor, M.A.
Oklahoma State University

M. Craig Edwards, Ph.D.
Oklahoma State University

Shelly Sitton, Ph.D.
Oklahoma State University

D. Dwayne Cartmell II, Ph.D.
Oklahoma State University

Shida R. Henneberry, Ph.D.
Oklahoma State University

Craig E. Watters, Ph.D.
Oklahoma State University

Brentney Maroney, M.S.
Oklahoma State University

James W. Hynes, Ph.D.
Sam Houston State University

Keywords: entrepreneurs; professional exchange; Sub-Saharan Africa

Introduction
Lack of international cooperation is considered one of the major challenges to overcome in achieving global agricultural development in the 21st century (Acker, 1999). The U.S. Department of State sponsored a grant proposal competition called the Professional Fellows Program in 2013 to address this challenge: “A two-way, global exchange program designed to promote mutual understanding, enhance leadership skills, and build lasting and sustainable partnerships between mid-level emerging leaders from foreign countries and the United States” (ECA/PE/C-13-01, p. 2). The objective was to enable economic empowerment of young entrepreneurs in selected regions of the world, including Sub-Saharan Africa (SSA). A proposal was funded to create professional collaborations and learning experiences between mid-level,
emerging entrepreneurs from Kenya, South Africa, and Uganda and U.S. entrepreneurs as part of a two-way exchange program. Most of the African Entrepreneur Fellows (AEFs) had an agricultural focus or business interests in allied sectors. The project facilitated entrepreneurship development for 23 AEFs in the United States for four weeks and provided international business experience for 11 U.S. participants in Africa for two weeks. The AEFs training included internship/job-shadowing experiences of three weeks in duration. The focus of this evaluation study was to ascertain the outcomes of this two-way exchange project and determine ways to improve similar exchanges in the future.

**Conceptual Framework**

This study was conceptualized based on Donald Kirkpatrick’s evaluation framework, which emphasizes four levels of training outcomes (Kirkpatrick & Kirkpatrick, 2006): 1) participants’ levels of satisfaction with the program; 2) changes in participants’ knowledge, skills, attitudes, and aspirations; 3) changes in participants’ professional behavior and practices; and 4) institutional impacts of participants’ behavior changes. The study focused on these four levels of outcomes.

**Purpose and Objectives**

This study’s purpose was to evaluate outcomes of an international exchange project for empowering entrepreneurs to increase economic development in SSA. Three objectives guided this study: 1) determine immediate, intermediate, and long-term outcomes of the project; 2) describe factors that contributed to successful implementation of the project; and 3) determine ways to improve similar exchange programs in the future.

**Methods**

Mixed-methods were used to collect data. Mixed-methods employ quantitative and qualitative approaches to data collection for complementing the weaknesses of each method with strengths of the other (Creswell & Clark, 2011). A pre- and post-test design was used to determine immediate outcomes, including changes in the AEFs’ knowledge, skills, attitudes, and aspirations. Knowledge was assessed using a retrospective pre- and post-test instrument containing nine items and a 5-point Likert scale (1, very low to 5, very high). If the concepts taught were new to the group, and participants had limited knowledge about such, testing the AEFs at the beginning may not have been valid (Rockwell & Kohn, 1989). This notion rationalizes the use of retrospective pre- and post-test design for assessing knowledge. The assessment of skills included six items and a 5-point Likert scale (1, not confident to 5, very confident). Attitudes were measured using 10 items and a 5-point Likert agreement scale (1, strongly disagree to 5, strongly agree). Cronbach alpha reliability estimates for the scales were ranged from .67 to .90. Focus group interviews were also conducted with the AEFs at the conclusion of their respective programs. (The AEFs came to the United States in two groups during 2014: 12 and 11, respectively.) A three-month follow-up was conducted with AEFs and the U.S. participants to determine intermediate outcomes. Continuous communication was maintained with the participants for tracing long-term outcomes. Paired samples t-tests were used to analyze the quantitative data. Qualitative data were subjected to content analysis (Hsieh & Shannon, 2005) and thematic coding to identify major themes (Creswell, 2007).
Results and Conclusions

Both the AEFs and the U.S. participants were highly satisfied with the exchange program. Comparison of pre- and post-evaluation data confirmed the AEFs developed entrepreneurial knowledge; gained business skills; and acquired positive attitudes toward U.S. business and culture. They were motivated to apply the entrepreneurial knowledge, skills, and attitudes acquired through their training experiences. The U.S. participants also gained a better understanding of the people, culture, and business environments in SSA.

Analysis of the three-month evaluation data received from the AEFs and U.S. participants led to concluding the exchange program had mutual positive impacts on their institutions. Both groups had established professional networks using new media platforms for future collaboration between their institutions and with internship mentors in the case of the AEFs. The AEFs reported sharing their experiences with co-workers in regard to promoting customer service and human rights, improving communication, and serving their communities. Some of the AEFs reported their businesses expanding into new ventures with the ideas and confidence they gained through the exchange program. These impacts showed the program had lasting positive effects on the AEFs’ businesses, institutions, and communities. The most significant institutional impacts for the U.S. participants was further internalization of their business approaches, increased understanding of potential business opportunities in Africa, and more appreciation of diversity in their workplaces. Some of these participants planned to use the newly established linkages with AEFs and their institutions for future business collaborations.

Recommendations and Implications

The AEFs’ suggestions can be used to make important recommendations for improving future exchange programs. First, it is important to pay more attention to the selection and matching of U.S. mentors with the business interests and learning needs of Fellows to ensure their learning expectations are met. Second, the international participants, based on their entrepreneurial interests, should be assigned mentors for longer periods of time to increase the likelihood of receiving more in-depth learning experiences and developing lasting professional relationships. Third, if possible, it is worth doing a long-term follow-up with the AEFs to determine whether they achieve their expected results from participating in the exchange program. A major implication of this study is the value of two-way, entrepreneurship-themed exchange programs between developing countries and the United States as a strategy for building capacity and linkages among professionals to address challenges in agricultural development.

References


Extension Post-Disaster Readiness: Perspectives of Dominica’s Farmers and Extension Officers

Wayne Ganpat
Department of Agricultural Economics and Extension
Faculty of Food and Agriculture
University of the West Indies, St Augustine, Trinidad
wayne.ganpat@sta.uwi.edu
(1 868 792 1721)

Tessa Barry
University of the West Indies, St. Augustine, Trinidad

Amy Harder
University of Florida

Keywords: Extension, farmers, extension officers, disaster, preparedness

Introduction
In August 2015, Dominica was ravished by Tropical Storm Erika which left an estimated 500M USD in damage. The agriculture sector was especially hard hit. McCarthy (2001) reported Dominica has experienced several storms since 1979 which significantly negatively impacted the agricultural sector. Dominica’s economy depends largely on agriculture, livestock, and fisheries (FAO, 2006); hence efforts must be made to mitigate losses due to these storm events.

No research has examined the preparedness of Dominican extension to respond to disasters and limited research exists globally. However, Telg et al. (2008) found extension agents in a U.S. state were not adequately prepared to apply their subject matter expertise following a disaster or to address the emotional needs of colleagues and clientele. While there is a Disaster Management Unit in Dominica, extension is under-represented. The state-run extension unit should be prepared to assist its farmers in the event of a disaster; this competency is of utmost importance for a small nation particularly vulnerable to severe weather patterns.

Purpose
This study sought to assess the readiness of extension to deliver on the expressed needs of vulnerable farming communities post-disaster. The study specifically sought to: (a) identify the major needs of farmers post-disasters; (b) describe the level of response received by farmers post-disasters; and (c) describe the current level of preparedness of extension staff to respond to the expressed needs of farmers.

Methodology
The descriptive study surveyed 15 extension officers (50% of the population) and 100 farmers, proportionately chosen from the seven agricultural regions in Dominica. The extension officers consisted of two officers per district. Farmers were randomly selected from the list of registered farmers in each region.

The survey instrument for the extension officers comprised four sections: (a) staff personal needs post-disaster, (b) professional needs, (c) communication efforts, and (d)
demographics. The farmers’ survey instrument consisted of five sections: (a) needs and assessment of support given after a disaster, (b) farmer groups, (c) communications, (d) barriers to accessing resources, and (e) demographics.

The instrument was examined for validity by experts in the extension field with academic and practitioner backgrounds, then pretested in Grenada with six extension officers and 10 farmers. Two questions related to sources of assistance were edited to expand response options.

The survey was conducted during July 2015 using face to face interviews. Descriptive analysis of the data was conducted using SPSS version 17. Most of the responding extension agents had more than ten years of work experience (73%) and were mainly District Officers (53%). Over half possessed a diploma (53%); only 6% completed a Master’s Degree. The majority of farmers were male (80%), had over fifteen years of experience (78%), and were over 50 years old (72%).

Findings and Conclusions

Farmers’ Perspectives on Needs and Level of Response

The majority of farmers (95%) reported they experienced hurricanes and 91% experienced drought. This was consistent with the responses of the extension officers where 100% reported drought and 87% hurricanes during their tenure. Hurricanes were identified as the most frequent disasters by both extension officers (67%) and farmers (49%).

Farmers identified their immediate needs after a hurricane as financial assistance (95%), planting material (89%), and fertilizers and pesticides (90%). They reported these same needs existed six months after experiencing the disasters (94%, 75%, and 92% respectively). While most farmers indicated they received assistance for their physical needs (73%) and were aware the majority of assistance given came from the Ministry of Agriculture through extension, some 66% indicated they were not satisfied with the response time by extension while only 22% stated they were satisfied. A majority of farmers (96%) reported they got no support for their emotional needs. Farmers identified unavailability of resources (76%) and political affiliation (78%) as major barriers in accessing resources after a disaster.

Regarding a plan for disaster management, the majority of farmers (56%) indicated they were not aware as to whether the Extension Division had a plan and 23% believed there was no plan. Half of the farmers (50%) indicated extension had not provided any sort of training for farmers in disaster management.

Extension Officers’ Perspectives on Preparedness

Most extension officers reported they had no support for their physical needs and similar to the farmers, the majority (73%) indicated no support for their emotional needs. Officers reported transportation as their greatest need (53%) to respond to farmers in a professional manner, supporting the slow response time reported by the farmers. While 67% responded as having had training in disaster management, the majority identified their greatest professional development needs were in the areas of hurricane disaster recovery efforts (53%) and helping farmers cope with stress (47%). Such training is a prerequisite for a disaster management plan, as suggested by Telg et al. (2008).

Recommendations, Educational Importance, and Implications

Extension officers need to be trained in the area of disaster management and mitigation strategies prior to the start of hurricane season annually. In turn, extension officers should provide annual disaster preparation training to farmers. This might be accomplished through
increased strategic collaboration with the National Disaster Management Agency and Agricultural Extension Delivery Departments guided by improved national policy on coordination between different agencies. Better governmental interagency collaboration will also be needed to address the stated needs and barriers by improving access to financial assistance and improving infrastructure to facilitate better response times by extension officers.

The importance of psychological preparation should not be overlooked, since neglect of psychological support after a disaster can impair efforts at physical rehabilitation (WHO, 2006). Extension officers are not trained mental health professionals, therefore the expectation must be to prepare officers to share appropriate mental health resources with their clientele. Officers should be taught to recognize the signs of a mental health crisis situation and how to get farmers assistance, as well as how to recognize when they need to seek help themselves. In these ways, extension will be able to improve the welfare of farmers by fulfilling vital technical and social service roles the next time disaster strikes.

References
Introduction and Theoretical Framework

Russia legalized the buying and selling of agricultural land in 2002 to help farmers expand their operations and food production for the nation (Lerman, 2004). The increased amount of land for agricultural production has underscored the need for governmental and university officials to enhance training opportunities for farmers (Bokusheva & Hockmann, 2006). A major element hindering the lack of Russian agricultural productivity is the deficiency of production information to farmers (Bezlepkina, Lansink, & Oskam, 2005). Russia provides more national resources toward the improvement of the dairy industry than the support and emphasis provided to crop commodities in the nation (Liefert & Liefert, 2012).

The Institute of International Education’s (IIE) Dairy Center of Excellence in Russia exists to encourage workforce effectiveness and preparedness in Russian’s agricultural sector via educational opportunities and industry specialists. The Center is comprised of four main components and one is the implementation of short-term training courses in the U.S. IIE worked with [university] to develop and implement a two-week training program to expose farmers to the U.S. Dairy Industry. The program was to host fifteen ($N = 15$) Russian dairy farmers. As a result of the training program, participants increased their knowledge of the U.S. Dairy industry to aid them in improving the capacity of the Russian dairy industry.

Lonegran and Andresen (1988) suggested field-based learning enables participants to learn via direct interaction with a context that reflects instructional content versus learning from textbooks or lectures in a classroom. Field-based learning provides opportunities to practice skills that cannot be conducted in a classroom (Nicholson, 2011). A product of field-based learning experiences is a greater appreciation of the visited context.

Purpose and Objectives

The purpose of this study was to better understand approaches to enhance field-based learning experiences for Russian dairy specialists. More specifically,

1. Describe field-based learning techniques that participants’ plan to share with colleagues; and
2. Describe participants’ perceptions regarding the most useful components of the field-based learning experiences.

Methodology

The study employed a qualitative research design. Fifteen ($N = 15$) Russian dairy farmers participated in the training. Participants completed a journal to reflect on their field-based learning experience. Reflective practice is the intellectualized, rationalized, and systematic process through which individuals obtain knowledge from their experience (Furman & Sibthorp, 2013). The concept of a reflection infers individuals recall their experience, reflect on their experience, think about their experience, and assess their experience (Jordi, 2011). The benefit of written reflections includes enhanced communication skills, critical thinking, and observational skills (Guthrie & Jones, 2012). Reflective experiences produced participant’s preexisting biases that may influence participant learning (Gouldthorpe, Harder, Stedman, & Roberts, 2012).

Reflections were conducted at the conclusion of the training and submitted to the trainer who then provided the reflections to the external evaluator of the project. Participants were assigned numbers ($R1 = \text{respondent 1}$) to protect individual anonymity in this study.

Findings

Objective one sought to understand what field-based experiences participants planned to share with Russian colleagues. All participants ($N = 15$, 100%) reported in their reflections one of the first things they planned to share with their Russian colleagues was the production levels of U.S. dairy operations. Eleven ($n = 11$) of the fifteen ($N = 15$) participants indicated structure of U.S. dairy farms is what they planned to share with colleagues once they returned to Russia ($R1, R3, R4, R5, R6, R9, R10, R12, R13, R14, R15$). Nine ($n = 9$) of the fifteen ($N = 15$) participants planned to share the reproductive programs conducted by U.S. dairy farmers with the peers upon returning to Russia ($R1, R3, R4, R5, R9, R10, R12, R13, R14, R15$). Eight ($n = 8$) of the fifteen ($N = 15$) participants indicated the field-based experiences motivated them to want to share U.S. forage production procedures at dairy farms ($R3, R4, R5, R6, R9, R10, R13, R15$). Only a few of respondents ($n = 4$) indicated they planned to share how dairy farmers work with agricultural extension organizations ($R1, R2, R11, R15$).

Objective two sought to indicated diverse components that were useful to participants.

Implications/Recommendations/Educational Importance

A majority of the participants ($n = 12$) recognized the value of seeing and experiencing the U.S. dairy industry first-hand during the training program and noted the importance of interacting directly with U.S. dairy producers. When asked, “What components of your training were the most useful to you and your work?,” R6 responded, “Field training sessions…[to] the industrial dairy facilities and dairy farms.” Participant reflections from this program demonstrate the need for field-based experiences being included in capacity building activities. Capacity building practitioners can greatly enhance training activities by engaging participants in field-based learning experiences.

References


Farmers’ Perceptions of News and Information Disseminated after the Cessation of Armed Conflict: An Assessment in the Republic of Côte d’Ivoire

Assoumane A. Maiga*, Ph.D.
Oklahoma State University
Stillwater, Oklahoma 74075-6032
Tel#: 405-334-9126
maiga@okstate.edu

M. Craig Edwards, Ph.D.
craig.edwards@okstate.edu

Marshall Baker, Ph.D.
marshall.baker@okstate.edu

D. Dwayne Cartmell II, Ph.D
dwayne.cartmell@okstate.edu

Joel Jenswold, Ph.D.
joel.jenswold@okstate.edu

Keywords: armed conflict, economic livelihoods, media, post-conflict recovery

Introduction/Theoretical Framework/Review of the Literature
The Republic of Côte d’Ivoire (RCI), also known as Ivory Coast, is a former French colony in West Africa (Bloom & Sachs, 1998). Agriculture engages more than 70% of the population and represents 43% of its GDP (United Nations Development Program [UNDP], 2013).

Armed conflict is defined as “a contested incompatibility that concerns government or territory or both where the use of armed force between two parties results in at least 25 battle-related deaths” (Eriksson, Wallensteen, & Sollenberg, 2003, p. 619). Between 2002 and 2011, RCI experienced armed conflicts resulting from political and social unrest (Apuuli, 2012). The conflicts affected its economy, particularly, the food and agricultural sector (World Bank, 2013). Access to agricultural inputs and land was difficult, causing disruption to agricultural and food production across RCI (World Bank, 2013).

Media could play a key role in bringing positive change in post-conflict countries (Fortune & Bloh, 2008). RCI’s media system consists of government-run media outlets, about 120 private radio stations, and some newspapers (infoasaid, 2013).

This study was guided by several media effects theories, including the agenda-setting theory, the use of and gratification model, and the social cognitive theory of mass communications (Bandura, 2001; Katz, 1959; Severin & Tankard, 2001). The Agricultural Knowledge and Information System for Rural Development (AKIS/RD) model was also used to support understanding the phenomenon (FAO & World Bank, 2000).
Purpose and Objectives

This study assessed farmers’ perceptions on the role of the media and other information sources in disseminating news and information after armed conflict ended in RCI.

Three research questions guided this study:
1. What were selected personal and professional characteristics of farmers who experienced armed conflicts?
2. How did farmers perceive the role of the media and other information sources in disseminating news and information to assist with their economic livelihood recovery?
3. How did farmers perceive the role of the media and other information sources in disseminating news and information to assist in building community resilience?

Methods and/or Data Sources

The study’s population included farmers living in post-conflict regions of RCI. Purposive sampling was used to select participants (n = 95), including crop producers, livestock owners, poultry producers, market gardeners, fishermen, and other rural citizens in the regions of Ferke and Gagnoa.

A survey questionnaire was used to collect data. It included a modification and adaptation of the Communities Advancing Resilience Toolkit (CART) instrument developed to evaluate a community’s resilience (Pfefferbaum, Pfefferbaum, Neas, Fran, & Van Horn, 2013). New constructs, items, and scales were added to the modified CART instrument based on a review of the literature, especially in regard to the media. The first part consisted of 12 primary questions with several items related to each, and included five-point, summated-rating scales (e.g., 1 = Not interested at all to 5 = Extremely interested). The questions asked about participants’ primary information sources, preferred language for receiving news and information, frequency of receiving information on agriculture and food topics, and other related interests after the cessation of armed conflicts. The second part included items describing the participants’ personal and professional characteristics. The questionnaire was administered orally in the farmers’ preferred languages.

A panel of experts at [...] University reviewed the instrument to ensure its content and face validity. A pilot study was conducted to test the instrument’s internal consistency and face validity; post-hoc reliability estimates ranged from .58 to .90. Descriptive statistics were used to analyze and report the data.

Results, Products, and/or Conclusions

The participants’ ages ranged from 20 to 84 (M = 39.37); 85.9% were male and 14.1% were female. A large majority (93.3%) had less than a high school education; 92.4% were married. They were almost equally distributed between Islam and Christianity, 49.5% and 45.2%, respectively; 5.4% practiced other religions. A large majority (89.2%) were producers of staple and cash crops.

Most participants (82.1%) preferred receiving information and messages from the media and other sources in their local languages; about 32% preferred French. The participants (83.5%) were extremely interested in receiving media programs on agriculture, weather forecasts, market news, and health and nutrition (median = 5). The participants (61.47%) perceived information and messages received after armed conflicts ended were extremely related to weather forecasts, market news, plant diseases, livestock diseases, farmer interest groups, child labor, land ownership, and natural resources (median = 5).
A large majority (83.7%) viewed information and messages about agriculture and food were shared very frequently amongst peer farmers (median = 5). However, 76.16% indicated information about food and agriculture was never shared on the Internet, via their mobile telephones, or in newspapers after the conflicts ended (median = 1). The participants (77.84%) viewed they very frequently received information about strategies for conflict resolution, child labor, and the role of women in agriculture from extension agents (median = 5). About one-half were Uncertain/Not sure the media and other information sources contributed to resilience building in their communities after the armed conflicts ended ($M = 2.61$).

**Implications and Recommendations**

The media because of their power are important change agents and play an essential role in complex social systems (Severin & Tankard, 1992). Media effects theories and the AKIS/RD model applied to the study and served in formulating recommendations. Media and other information sources should provide informational programs in the farmers’ local languages and in French. Their focus should be on agriculture and food production, natural resources, and environmental issues targeting farmers who experienced armed conflicts. In addition, more strategies are needed for using mobile telephones to inform farmers who experience armed conflicts. The Internet access of rural citizens must be improved. Additional research should be conducted about the perceptions of media professionals, extension agents, NGO personnel, and other stakeholders regarding their roles in the economic recovery of farmers after armed conflicts. Finally, more research should be conducted about the perceptions of media professionals and other information providers regarding their contribution to building community resilience after armed conflicts, especially in the agrarian societies of developing countries.

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The Future of Program Evaluation in International Extension

Anil Kumar Chaudhary
Doctoral Student, Graduate Assistant
University of Florida
Department of Agricultural Education and Communication
Gainesville, FL
akchaudhary@ufl.edu
Phone # 352-273-2614

Seth B. Heinert
Doctoral Candidate, Graduate Assistant
University of Florida
Department of Agricultural Education and Communication
Gainesville, FL

Keywords: Evaluation, International Extension Programs, Funding

Introduction

Recently, many pressures have forced donors, governments, and non-governmental organizations (NGOs) to emphasize project performance and reporting of project impacts (Franz & Townson, 2008, Nichols, Blake, Chazdon, & Radhakrishna, 2015; Peters & Franz, 2012; Radhakrishna, 2000, 2001; Rennekamp & Engle, 2008). An important component of any international agricultural development proposal is the evaluation (Radhakrishna, 2001). The international programs with cost-benefit analysis component are easy to evaluate, while educational outcomes (improvement in knowledge, awareness, and skills) are hard to evaluate and have limited evaluation information (Bayles, 1998; Radhakrishna, 2001). In the examination of 147 agricultural projects funded by United States Agency for International Development (USAID) from 1985 to 1995 for their evaluation efforts, Bayles (1998) found that 64% of projects reported at least one evaluation finding and only one project reported the impact evaluation. Major problems concerning evaluation were: grandiose goals, frequent change in administration, and unavailability of baseline data (Bayles, 1998). Radhakrishna (2001) identified macro and micro level challenges to program evaluation and accountability. The macro challenges were: the changing world, relevance of educational programs, greater demand for impact and accountability and explosion of information, while micro challenges were, for example, limited evaluation skills (Radhakrishna, 2001). There is limited research that examines the current status and vision for evaluation from the perspective of international donor agencies.

Purpose and Objectives

The purpose of this study was to examine the current status of international development programs evaluation and vision for future of evaluation from the perspective of international donor agencies. The specific objectives of the study were to:

1. Determine current factors and barriers currently shaping program evaluation for international development programs and later develop a conceptual model for the present and future of evaluation
2. Develop an impact model from the perspective of funding agencies exhibiting how greater accountability requirements translate to evaluation of programs by practitioners

Methodology

Data were collected by reviewing relevant literature and conducting group interviews. A number of journals and conference proceedings with emphasis on evaluation of agricultural and extension education programs were reviewed to develop themes. Semi-structured group interviews were held over three days in April, 2015 with 18 individuals representing six agencies at their headquarters in the Washington D.C. area. Groups interviewed were: United States Department of Agriculture’s National Institute of Food and Agriculture (NIFA), Foreign Agricultural Services (FAS), USAID, Higher Education for Development (HED), Food and Agriculture Organization of the United Nations (FAO), ACDI/VOCA and Catholic Relief Services (CRC). Both researchers took field notes during the group interviews, analyzed the data using the content analysis, and developed themes separately (Creswell, 2005). They then worked together to reach agreement on the final themes used for the conceptual and impact models.

Results and Discussions

Objective 1

Based on the analysis of interview data and review of literature, we proposed a conceptual model (Figure 1) for the present and future of program evaluation for international development programs.

Six primary factors were determined to currently be shaping program evaluation:
1. Use of information communication technologies (ICT) has become readily available which has implications for data collection and analysis.
2. Competencies required by the evaluation team are increasingly complex.
3. Common frameworks are often required by large funding agencies.
4. Local relevancy should drive program evaluation, but this often gets diminished.
5. Administration of funding agencies is constantly changing resulting in changes to funding priorities, evaluation requirements, etc.
6. The rigor required in evaluation methodology is increasing.

Six barriers were determined to currently be shaping program evaluation:
1. Shifting demographics of target audiences and the programs needed to address complex problems demands a greater set of competencies from program evaluators.
2. Program relevance, and an increasing need to demonstrate impact, has placed scrutiny on programs.
3. Budget cuts from granting agencies may substantially decrease the amount of money available for evaluation.
4. Anti-governmental sentiments by target audiences makes access difficult.
5. Increasing levels of accountability may hinder practitioners from accomplishing their objectives.
6. The virtual explosion of information may be overwhelming.
Objective 2

Based on the analysis of interview data and review of literature, we proposed an impact model (Figure 2). According to this impact model, funding agencies are mandating greater accountability requirement for projects they are funding, which in turn require the practitioners working for those projects to show impacts of their projects. The practitioner’s ability to produce hard evaluation findings depends on their competency level and their familiarity with various ICT, such as innovative data collection and data analysis software. Due to greater accountability requirement, greater rigor in evaluation methodology is needed which in turn influenced by competencies of practitioners. Evaluation of programs is also influenced by common framework requirement by various agencies such as USAID, and requirement to showcase the relevance of programs to the program site and target audiences. This evaluation in turn improves program impact, satisfying the needs of funding agencies.
Conclusions, Recommendations and Implications

Conclusions

1. The role of evaluation is becoming more central to obtaining funding and is often mandated by funding agencies.
2. Evaluation, especially measuring impact, is a complex process.
3. A common struggle for many program providers is when they are forced to use a universal framework, such as is often required by USAID, and still try to get meaningful feedback for program improvement.
4. Cultural and language challenges compound the difficulties of gathering meaningful data.

Recommendations / Implications

1. Include evaluation in the program planning process. Do not wait until the program is drawing to an end to begin considering how you will evaluate it.
2. Budget for evaluation. A good estimate is 10 percent of your overall budget should be set aside to cover program evaluation.
3. Incorporate information communication technology as a way to quickly gather data in real time and use participatory methods.
4. Build capacity with stakeholders to get them involved in conducting program evaluation.

References


A Gender Perspective of Effect of Climate Change On Tomato Production In Nigeria

Adebisi- Adelani Oluyemisi
National Horticultural Research Institute
adelanidotol@yahoo.com or adelanidotol@gmail.com
+2348059221500

Keywords: Tomato, Horticulture, Small holder farmers, Climate adaptation strategies, Production

Abstract

Weather vagaries caused by climate change constitutes a major constraint to production of rain-fed crops in Nigeria. Agriculture in Nigeria which is dominated by resource-poor, small holder farmers is mainly rain-fed. Tomato is an important horticultural crop with promising potentials of mitigating the obvious food, nutrition and health challenges in Nigeria while alleviating poverty among the resource-poor farmers. Tomato production in Nigeria can therefore sustainably develop local communities. However, the perspective of Nigerian farmers with respect to gender on the impact of climate change on tomato production a front liner vegetable among horticultural crops has not been fully documented. Therefore, gender perception of the effect of climate change on production of this crop was investigated. The objectives included identifying the personal characteristics of the tomato farmers, assessing the respondents’ awareness of changes in major climate parameters, the sources of information on climate change in the study area, describing the level of tomato farmers’ production over the last decade and ascertaining the adaptation strategies of these farmers in coping with climate change.

Ten percent of the population were randomly selected; 202 respondents (156 male and 46 female gender) were obtained using a multi-stage sampling technique from four predominantly tomato producing zones in Nigeria which are the South Eastern (Imo), South Western (Oyo), North Eastern (Gombe) and North Central (Benue). Twenty-five percent of extension blocks were purposively sampled and 50 percent of the cells were randomly sampled based on the existing Agricultural Development Projects (ADP) structure. Both qualitative (Focus group discussions) and quantitative tools (structured interview schedule) were used for data collection. This was backed up with secondary data from Food and Agriculture Organisation statistics of tomato production for 2001 – 2009; this study was conducted in the year 2009. Secondary weather data for these zones were also used to back up the findings of this study. Data were analysed using descriptive statistics such as frequency counts and percentage computations. Inferential statistics such as Pearson product moment correlation (PPMC), t-test, logit regression analysis and analysis of variance (ANOVA) at p = 0.05.

The mean age and family size of both male and female farmers were 44.6±9.7 years and 7.1±3.4 persons respectively. Majority of the farmers, both males and females were married (71.8% and 15.8% respectively), 62.9% (47.0% males and 15.9%) cultivated 1-3 hectares of land while 52.0% (38.6% males and 13.4%) had between 10 and 20 years farming experience and 41.2% had secondary education. There was high level of awareness (59.4%) of change in climate by respondents while 40.6% had low level of awareness. Radio (84.1%), family members (61.7%) and television (51.5%) were major sources of climate change information. Mean production of tomato was 7364.0±4056.2 tonnes for 2000 and 4319.6±2549.3 tonnes for 2009;
Percentage decrease in production between 2000 and 2009 was 41.3%. Climate change was adduced as reason for reduction by 61.8% of farmers, effect of climate change on production was considered unfavourable by 55.9% tomato farmers (45.0% males and 10.9% females). However, there was no significant difference in the perception of climate change by male and female farmers (t = -1.260, t = -1.246). The adaptation strategies utilized by the farmers in the study areas included digging of wells, praying to a supernatural being and construction of ridges across slopes. A weak relationship existed between the extent of use of adaptation strategies and change in tomato production (r =0.252). More male farmers (χ² = 37.365) significantly utilised adaptation strategies when compared with their female counterparts (χ² = 24.348). Change in production across the four agricultural zones differed significantly (F =7.441) with the production of tomato highest in the North Eastern zone (4394.9 tonnes) and lowest in the South Eastern zone (300.1 tonnes).

The effect of climate change was obvious in the study area as it resulted in a drastic decline in tomato production between years 2000 and 2009. A regular and timely dissemination of climate change information, gender-specific adaptation strategies such as digging of wells and construction of ridges across slopes that would increase tomato production, increase the farmers’ income and enhance their livelihood while improving the local communities. Also the issue of drought tolerance tomato variety should be addressed by breeders in horticultural research Institute so as to make the seed available for the resource poor farmers in the face of climatic changes so as to have increase yield, more income thus leading to the growth of communities in question.

References


Agricultural Extension and rural development Department, University of Ibadan, Ibadan. 226 pp.
Fostering Global Leaders through a 4-H International Village

Susan D. Seal
Mississippi State University
School of Human Sciences
255 Tracy Drive, Box 9745
Mississippi State, MS 39762
Phone: (662) 325-7317
Fax: (662) 325-8188
Email: susan.seal@msstate.edu

Donna J. Peterson
Chieko Iwata
Caroline Kobia
K. Raja Reddy
Mississippi State University

Keywords: global, international, 4-H, workshop, cultures

Introduction
4-H reaches over 7 million young people in over 50 countries and has a strategy that includes a vision of a sustainable and innovative global network that will empower youth to reach their full potential (National 4-H Council, 2015). Over the years, various international exchange programs and other travel abroad opportunities have been developed. However, many youth do not see participating in a study abroad type program as a possibility (Ludwig, 2002), and there are few opportunities within local, state and national 4-H projects for youth to expand their global mindedness without leaving their home country. Global mindedness is defined as a world view in which one sees oneself as connected to the world community and feels a sense of responsibility for its members (Hett, 1993). In a world that is increasingly interdependent, expanding the global mindedness of our youth is a critical component in developing successful leaders.

A team of [University] faculty developed and implemented an International Village at the State 4-H Congress to build interest in a statewide international 4-H program and ultimately in international experiences and global issues. Suarez-Orozco (2007) stated, "Student learning about globalization should include more than the acquisition of knowledge about world history and cultures" (p. 48). Therefore, the 4-H International Village was designed to excite, encourage and engage young people in their world and with cultures different from their own.

Purpose
The 4-H International Village replicated visiting three foreign countries and being immersed in those cultures. The goals were to
- develop an understanding of globalization,
- expand youth’s knowledge of and interest in traveling abroad,
- cultivate an interest in foreign cultures, and
- increase youth’s knowledge of the specific countries.
Methods

Planning for the 4-H International Village included several steps. First, a team was assembled that included faculty native to each specific country highlighted in the Village (Kenya, Japan, and India) to provide youth with an authentic experience. The team consisted of the assistant professor of international agricultural and extension education; the coordinator of the Japan outreach program; an instructor in fashion design and merchandising, who is native to Kenya; a professor in plant and soil sciences, who is native to India; and an Extension evaluation specialist.

The team determined that tea, food and fashion were common topics to highlight and proceeded to develop country-specific learning objectives and cultural experiences related to those topics. A pre- and posttest were developed that was comprised of “Culture” items from the 4-H Common Measures Citizenship tool for 8th-12th graders and additional questions to assess country-specific knowledge. The team set the agenda and developed content for the introductory and closing sessions. Materials were developed including a replica passport and content for a participant’s notebook. The team and other volunteers staged the rooms the day prior to the 4-H International Village.

Product

The 4-H International Village began with the participants entering through “passport control” where “officers” provided them with the replica passport with simulated visa stamps for India, Japan and Kenya. The participants were also given a notebook that included the pretest; a world map; information sheets on India, Japan, Kenya and the United States; recipes (15) from each country (including recipes for foods provided in the Village); information sheets on “4-H Around the World” and “4-H Programs in Africa”; safety information for U.S. students traveling abroad; links to various resources related to India, Kenya, Japan, international travel, international organizations, and study abroad programs; contact information; and the posttest.

Participants began the International Village experience in an introductory session. After finishing the pretest, participants learned about their passports and received tips for traveling abroad. The youth were then divided into groups and began touring the three countries. As participants entered each room, they experienced the sights, sounds and aromas of the country represented. They also engaged in activities such as henna art, tea ceremonies, origami, and games while enjoying a variety of foods and teas from each country and learning about other customs and traditions. After 25 minutes, participants received their departure passport stamps and moved to the next country. After each group had visited all three countries, everyone returned to the general session room to complete the posttest, share and reflect on their experiences and ask questions. In order to increase global mindedness in their home counties, participants were encouraged to present international-related programs in their local 4-H clubs using the information in their handbooks as a guide.

Results

Thirty-seven participants completed the pre- and posttest surveys. Participants ranged in age from 14 – 18 years. Nearly two-thirds (65%) were female, while 68% indicated their race was “White.” Participants were nearly equally distributed in residence location, with 35% living on a farm, 27% living in a rural community (non-farm residence) with a population of less than 10,000, and 38% living in a town or city with a population of 10,000 – 50,000.
The pretest consisted of 4 culture-related Likert type questions from the 4-H Common Measures Citizenship tool for 8th – 12th graders, 10 content-related questions for the countries visited to assess knowledge, and 5 personal demographic questions. The posttest contained the same questions as the pretest (with the exception of the demographic questions). Paired samples t-tests indicated that the differences in culture-related attitudes from pre- to posttest were statistically significant.

At pretest overall, only 26% of the content-related country questions were answered correctly. However, in the posttest, 81% of the questions were answered correctly. Participants in the 4-H International Village improved their culture-related attitudes and content knowledge of specific topics addressed in the workshop. A request has been made by 4-H staff and multiple agents to repeat and expand the program for next year. At least two county programs have been implemented as a direct result of the International Village.

**Educational Importance**

Currently, many students interested in careers in agricultural and Extension education have little international experience (Lockett, Moore, & Wingenbach, 2014). Providing cultural experiences within their home state or region, can improve cultural knowledge and culture-related attitudes and may be a catalyst for increased interest in other international-related programs.

**References**


Grounded or Taking Flight? Faculty Perceptions of Leading a Study-Abroad Experience

Dr. Laura L. Lemons  
Holly N. Webb  
Dr. Susan D. Seal  
School of Human Sciences  
255 Tracy Drive, Box 9745  
Mississippi State, MS 39762  
Phone: (662) 325-1804  
Fax: (662) 325-8188  
Email: laura.lemons@msstate.edu

Keywords: Study abroad, faculty led, barriers, focus groups

Introduction

The International Institute of Education (2015) reported that most responding campuses had taken action to increase their study abroad participation with over 61% of respondents stating that faculty-led study abroad programs (SAPs) had been added. With this increase in faculty-led SAPs, the responsibility of faculty in the role of students’ global education also increases (Goode, 2008). Although these experiences enhance the global perspectives and intercultural sensitivity of college students (Zhai & Scheer, 2002) and have a strong impact on students’ personal, educational and career growth (Dwyer & Peters, 2004), are these the factors that motivate faculty to add responsibilities to an already stressed workload? Faculty have also expressed that study abroad experiences provide value within their own profession (Dooley, Dooley & Carrazana, 2008). However, in 1991, Goodwin and Natch found that factors including decreases in funding, promotion and tenure policies, two career households, and American academic arrogance were among barriers for leading study abroad programs. Do these barriers still exist almost 25 years later? Considerable research from the student perspective has been done. This paper focuses on the faculty perspective of study abroad experiences.

Purpose and Objectives

The purpose of this study was to explore faculty perceptions regarding organizing and leading study abroad experiences for students. Specific questions guiding the research included:

1) What motivates faculty members to plan and carry out study abroad experiences for students?
2) What barriers do faculty members encounter in planning and conducting study abroad experiences for students?
3) What do faculty members perceive as the primary barriers for students in participating in study abroad experiences?

Methods

This qualitative case study employed focus groups to collect data. A list of faculty members who offered a study abroad course between Spring 2012 and Summer 2015 was obtained from the Office of Study Abroad at Mississippi State University. The list included courses that occurred as well as those that did not come to fruition, due to lack of minimum student enrollment. Thirty-four faculty members received an invitation to participate via email.
Two opportunities were offered, with eight faculty members participating in the first focus group and six faculty members participating in the second focus group. A researcher-developed moderator’s guide with 10 questions was utilized. Each focus group lasted approximately one hour. A variety of disciplines, study abroad locations, and program characteristics were represented. Both focus groups were recorded and transcribed for analysis. The moderator and a research assistant took additional notes during the focus group interviews. Both researchers analyzed and open coded the data independently (Merriam, 2009). Analyses were compared and codes were sorted, compiled, and categorized into themes (Merriam, 2009).

**Results and Conclusions**

This qualitative case study investigated faculty members’ perceptions of organizing and leading a study abroad experience. The data revealed three overarching themes: 1) Study abroad offers a number of benefits to students and faculty, alike; 2) Establishing value of study abroad experience is important; 3) Faculty face barriers in providing study abroad experience for students.

Faculty talked repeatedly about what students gain from study abroad experience. They noted that students had the opportunity to engage in discipline-specific content in a way they could not in the U.S. Faculty also recognized that students experienced significant personal growth in terms of understanding, experiencing, and tolerating cultural differences. Participants noted that international experience aided in preparing students for potential future careers by developing their resume and exposing them to opportunities and organizations with international considerations. Additionally, faculty noted that study abroad experiences provided opportunities for their own scholarly research, as well as personal benefits such as traveling and experiencing cultures they might not otherwise have the time or resources for. Student benefits as well as personal benefits provided motivation for faculty to offer study abroad experiences.

Participants spoke about the value that must be provided by study abroad experiences. Students seek out specific characteristics in study abroad opportunities and identify other characteristics as barriers. Course credit was found to be an imperative component for study abroad courses. Students sought experiences that provided an adequate amount of course credit that could be applied to their specific degree program. Additionally, students weighed other characteristics such as total cost of the experience, location and timing of the experience, feedback on experiences from peers, and a desirable balance of work and fun.

The final theme indicated that faculty experience barriers in planning and leading study abroad courses. Participants indicated that support was crucial at all phases and from a variety of sources. Faculty expressed a need for help during the planning stages, the value of assistance from in-country contacts, as well as the necessity of university support.

While faculty acknowledged the difficulty and burden of planning and leading study abroad experiences for students, they emphasized the benefits of those experiences. Faculty discussed the need for experiences to provide multi-dimensional value to students in order for students to participate.

**Implications/Recommendations**

These findings support previous research that established study abroad experiences as a beneficial and high-impact educational practice. While it is unrealistic to think that all students in higher education will or ought to participate in study abroad, this study reveals some practices that may encourage more students to take advantage of such opportunities. Specifically, faculty
planning an experience should begin by considering what value it brings to students’ education. The course and experience should be intentionally and clearly structured to enhance and expand students’ required coursework. The value and expectation of study abroad experiences should be articulated to students early in their degree program.

Findings also indicate that faculty not only desire, but may require significant assistance in order to plan and carry out study abroad courses. Faculty appreciate study abroad office staff who can investigate and confirm logistical components. Additionally, faculty voiced their belief that students who study abroad should be strongly supported financially by the university. Offices of study abroad should build and maintain relationships with in-country contacts who can assist in the planning and execution of experiences in locations frequently visited by faculty and students.

References
Growing Communities Through Local Food Systems: Is a 4-H School Gardening program viable in Burundi?

Lauren Hrncirik  
Washington State University  
1525 E. Wheeler Road, Moses Lake, WA 98837  
Office: 509-754-2011 Ext. 4314  
Fax: 509-766-2334  
Lauren.hrncirik@wsu.edu  

Mary Katherine Deen  
Washington State University  

Kevin Wright  
Washington State University  

Keywords: Needs assessment; Burundi; Educators; School Gardens; 4-H Youth Development

Introduction  
Burundi, Africa is the third poorest country in the world (Klugman, 2011). Many of the economic, political and cultural challenges Burundians face today can be traced back to a turbulent history of European colonization and ethnic-based violence. Today, ten years after the civil war that killed 200,000 and displaced 1.3 million, Burundi is still recovering from immeasurable destruction. Eighty-one percent of the population lives in multidimensional poverty (Malik, 2014). The economy and livelihood of 90% of Burundi’s population is dependent upon agriculture, the majority whom are subsistence farmers (Central Intelligence Agency, 2015). With approximately 5 million youth under 18 years old (more than half of the current population), Burundi is at a turning point. The history of violence can continue to repeat itself or the rising leaders of Burundi can pave the way for a brighter future.

For the past 100 years in the U.S., the 4-H Youth Development program has opened doors for young people to learn the skills needed to be proactive forces in their communities. 4-H, the nation’s largest youth development organization began as a solution to agricultural challenges in rural America (National 4-H Council, n.d.-a). Research shows that 4-H youth do better in school, make healthier lifestyle choices and are more engaged in their communities (Lerner, 2013). The success of 4-H in the U.S. has inspired programs to develop around the world. 4-H is present in 15 counties in Africa, including Burundi’s neighbors Tanzania, Kenya, and Uganda, and “helping prepare Africa’s young people to meet urgent regional needs, including hunger, sustainable livelihoods and food security” (National 4-H Council, n.d.-b). One example is the USDA/USAID Cultivating Learning with School Gardens pilot program in Congo, Rwanda and Mozambique (2005-2013) which developed and delivered teacher training programs using school gardens as an avenue for students to apply academic concepts (U.S. Department of Agriculture, 2013).

Despite the cultural and historical differences between Burundi and the U.S., researchers hypothesized that a 4-H school gardening model would be applicable in rural Burundi. As the 4-H model has demonstrated in the U.S. and other African countries, educating youth is paramount to bringing about change.
Purpose and Objectives

The purpose of this needs assessment was to gain information on: How do public school teachers, school administrators and NGO educators in rural Burundi:

1. Describe the needs of elementary students and challenges of teaching/working with this population?
2. Perceive the viability of implementing a 4-H Youth Development School Gardening program in the public schools?

Methods

Collaborating with a local Burundian non-governmental organization (NGO), U.S. researchers conducted training and focus group sessions using a semi-structured protocol to assure consistency across data collection groups. The format consisted of a one-hour introduction to 4-H and one-hour focus group, replicated in three locations in Burundi with rural public elementary school teachers, school administrators and NGO staff (N=37). All sessions were conducted with the assistance of an interpreter. Immediately after each session the researchers and interpreter met to discuss the results and to clarify any misunderstandings or questions. Using standard grounded theory practice, researchers met to determine coding rules before independently coding the responses for each question. To ensure consistency and reliability the researchers met periodically to compare results and discuss differences. Once the researchers concluded coding, they met with the interpreter to affirm results. The process was guided by the Empowerment Evaluation philosophy, which aims to “to help people help themselves” (Fetterman, 1996, pg. 5).

Results

Results were organized based on the two research questions. In response to the first research question two themes emerged. First, participants reported that poverty was the greatest challenge they faced in working with youth. Students arrive at school hungry and do not receive any kind of nourishment while at school nor can they afford to bring food from home. Students do not have books or school supplies. They also have little or no time for out of school activities (e.g. homework or reading) because they are helping with chores. The second challenge identified was the lack of professional development. Teachers reported strong interest in gaining knowledge and skills in teaching methodologies, youth development and horticulture to implement school gardens.

In response to the second research question, participants expressed the most interest in the 4-H pledge and the school gardening curriculum. They felt that the 4-H Pledge exemplified what they want their youth to learn and how they want them to live their lives. Participants unanimously agreed that the 4-H pledge fit well with Burundian values and also responded positively when asked if the school gardening curriculum would fit their educational system and be useful for creating school food systems.

One of the primary reasons for supporting the 4-H school gardens were that most Burundians have a home garden and have a desire to learn more about how to better produce foods for their families and how to bring their produce to market. In addition, schools are in dire need of a system to offer their students food while in school.

Conclusions and Recommendations

Based on the initial needs assessment, researchers found that the 4-H youth development
school gardening program would be a viable opportunity for rural Burundian students and schools. Researchers determined that the success of the needs assessment was based on several key principles:

1. The partnership with a trusted, local organization was invaluable to identifying, recruiting and establishing rapport with the study’s participants.
2. The local partners assisted with the development of research questions and served as cultural and language interpreters.
3. The use of an evidence-based, culturally and geographically relevant curriculum, such as *Cultivating Learning with School Gardens* that had demonstrated effectiveness in similar contexts was paramount to assuring success in the local culture.

Finally, this study reinforces the fundamental importance of conducting needs assessments within the community where programming will be implemented. Much like domestic programming, international extension programming must be based on local needs and issues.

**References**


How Competent are Agricultural Extension Professionals in Nepal?

Ramjee Ghimire
Michigan State University
Department of Community Sustainability
Room 150, 480 Wilson Rd, Natural Resource Building
East Lansing, MI 48824
ghimirer@msu.edu

Murari Suvedi
Michigan State University

Keywords: agricultural extension professionals, core competency, assessment, Nepal

Introduction

Competent extension professionals are assets for agricultural extension services. Diverse and dynamic agricultural systems, advancing science and technologies, changing sociodemographics, the spread of globalization and growing competition for resources demand that agricultural extension professionals be proficient in the technical aspects of their areas of expertise as well as in the processes and delivery of the services (Cochran, Ferrari, & Chen, 2012; Maguire, 2012; Melak & Negatu, 2012; Rivera, Blum, & Sulaiman, 2009; Swanson & Rajalahti, 2010). As Maddy, Niemann, Lindquist and Bateman (2002) stated, “Extension employees should possess the necessary competencies to anticipate and deliver quality educational programs of relevance and importance to our publics” (p. 1).

The scope of agricultural extension services (AES) has been widening, and “If extension is to thrive, it must understand and adjust to rapid changes and emerging challenges” (Extension Committee on Organization and Policy [ECOP], 2002, p. 2). The challenges include offering new services while strengthening collaboration and synergy among extension service providers (Sulaiman & Davis, 2012). Extension professionals with current knowledge who are able to make informed decisions about agricultural systems and who possess skills needed for adaptation and facilitation can make significant contributions to extension services and thus to agricultural development (Hoffman, 2014; Qamar, 2005). These calls for organizational changes and new tasks indicate the need for multiskilled human resources in extension services.

In many developing countries, however, human resource management in agricultural extension services has been a problem. The roles of staff members are poorly defined and proper performance appraisal systems and accountability are lacking (Axinn, 1988; Urmani & Jain, 2010). The skills, knowledge, behaviors and abilities of extension professionals should be defined, and extension services -- along with extension education and training programs -- should be periodically assessed to address the challenges (Caffarella, 2002; Mulder, 2014). AES in Nepal is no exception.

Agricultural extension services in Nepal have networks throughout the country, but they have not been effective in addressing the felt needs of diverse clients (Suvedi & McNamara, 2012). A possible reason could be that, as in many developing countries, extension professionals in Nepal are trained in a traditional education system (Belay & Abebaw, 2004; Thapa, 2010) where the focus is on technical subjects rather than on process or soft skills (Swanson, 2008). Training and education have not been able to motivate extension workers for better performance;
instead, at times they yield frustration because of performance evaluation weaknesses inherent in the entire system (Thapa, 2010). Empirical evidence about the competency of extension professionals is lacking. Assessment of the core competencies of extension professionals, therefore, becomes a necessity.

**Purpose and Objectives**

The purpose of this study is to assess the core competencies of extension professionals. Specifically, this study seeks to assess the perceptions of agricultural extension professionals on the importance of competencies; assess their level of competencies; examine the gap in perceptions of the importance and the level of competencies; and assess whether the level of competencies of extension professionals differs by their demographics.

**Method**

An in-person survey was employed to collect the data. Review of the literature and opinions solicited through exploratory focus group discussions with academics, extension experts and private entrepreneurs were the bases for the survey. The survey contained three sections: eight core competencies with five to seven competencies in each and 48 competencies in total; additional information on core competencies; and demographics. Each competency has two parts—importance and level of competency—measured by a five-point Likert scale. The survey was pretested among selected extension officials. Reliability coefficients for statements of all eight core competencies were 0.75 or higher.

Extension professionals in the Department of Agriculture (DOA), the Department of Livestock Services (DLS) and selected non-governmental organizations (NGOs) were the population for this study. The survey was administered with 360 professionals—167 respondents from the DOA, 177 from the DLS and 11 from non-governmental organizations. Six percent of the respondents were females.

**Results**

Respondents rated all competencies as important or very important to their work. They indicated their level of competency in these areas as moderate or high. Competencies that respondents rated to have relatively low competency were program evaluation and computer use. The paired $t$-test results show significant differences between importance and level of competencies for all competencies, with importance getting higher ratings than level of competency.

The independent sample t-tests show differences in ratings of competencies—12 for importance and three for level of competency—by gender. Females perceived familiarity with government rules and regulations; listening skills; use of Microsoft word, Excel and PowerPoint; and computer and mobile phone use to be more important than males did. Developing extension programs that benefit women, conducting monitoring and evaluation, career advancement, knowledge of agribusiness and upholding a positive attitude toward extension work are other competencies that females perceived to be of higher importance. Respondents from the DOA perceived 13 competencies—including teamwork, using communication channels to disseminate information, public speaking skills, use of qualitative tools to collect evaluation data, diversity and technical subject matter related competencies—to be more important than their DLS counterparts. Respondents from non-governmental organizations perceived to be more confident in using Microsoft programs, web browsing and ICTs use than DOA and/or DLS counterparts.
respondents. The results show that respondents need to improve their levels of competence to perform high-quality extension work.

**Recommendations**

The agricultural training centers in Nepal should provide training to extension professionals on computer use (Microsoft, email, Internet, web browsing), program evaluation and refresher training on technical subject matter of their fields. The DLS should organize orientations for its extension professionals on the importance and use of communication in extension; program evaluation and use of qualitative research tools—focus groups, in-depth interview, etc.; and diversity in agriculture. Agricultural universities and colleges in Nepal should review their extension education curricula, include the above-mentioned competencies in curricula and recruit competent educators to teach these competencies.

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Identifying International Agriculture Concepts for Secondary Agriculture Education Curricula

Nathan W. Conner
Assistant Professor of Agricultural Education
Agricultural Leadership, Education, & Communication
236 Filley Hall
Lincoln, NE 68583-0947
402-472-3938 Phone
402-472-5863 Fax
nconner2@unl.edu
University of Nebraska-Lincoln

Hailey Gates
Tennessee Tech University

Christopher T. Stripling
The University of Tennessee

Seth B. Heinert
University of Florida

Keywords: global education, agriculture education, and curriculum development

Introduction/Theoretical and Conceptual Framework/Review of the Literature

The global success of the agriculture industry has created an emerging need for agricultural education to take a more globalized approach when preparing students for agricultural careers (National Research Council, 2009). Maidstone (1995) suggested globalization of the curriculum needs to take place due to the emergence of a worldwide political economy, greater interdependency among nations, changes in international security, and demographic changes in society. Bruening and Shao (2005) described an internationalized curriculum to be part of a process that would prepare students to work in an increasingly interdependent world. According to Hurst, Roberts, and Harder (2015), high school agricultural teachers typically hold positive beliefs and attitudes towards global agriculture issues and see the value of internationalizing the secondary agricultural curriculum. Secondary agricultural teachers agreed students should learn about how the agricultural industry interacts with the world, how food prices are affected by agriculture, and how events that take place in one part of the world influence agriculture in another part of the world (Hurst, Roberts, & Harder, 2015). Taba’s (1962) seven steps of curriculum development were used as a framework to guide the selection of content and the organization of content in order to lead towards the development of an internationalized secondary agricultural curriculum.

Purpose and Objectives

The purpose of this study was to identify international agriculture concepts for secondary agricultural curricula. The objective of this study was to identify overarching concepts that should be included in the Agriculture, Food, and Natural Resources (AFNR) career cluster to
internationalize the secondary agricultural curriculum.

**Methods**

A Delphi Study was used to obtain a general consensus from a panel of experts. The methodology behind the Delphi method is based on the old adage that two heads are better than one (Dalkey 1969). By surveying experts in the field, we were able to gain a better understanding of what international agriculture should look like in the AFNR career cluster.

The following criteria were used to select the panelist: (a) the panelist must have at least three years of classroom experience as a secondary agriculture teacher or extension agent, (b) be currently employed in agricultural education at some capacity, and (c) have experience with international agriculture either through study abroad programs, international development, foreign exchange students, or through experiences with incorporating international agricultural practices into educational curriculum. In accordance with Goodman’s (1961) snowball sampling method, we purposefully selected one teacher educator, one high school agriculture teacher, and one AFNR curriculum specialist who met our requirements, and asked them to provide us with nominations of other professionals who met the criteria. Twenty-four nominations from across the United States were considered for this study, but only 17 agreed to participate. The members of the panel represent 6 states including Tennessee, Alabama, Florida, Oklahoma, Texas, and Pennsylvania and included 10 agricultural teacher educators, four high school agriculture teachers, and 3 agricultural education curriculum specialists.

Data were collected over a period of three rounds through Qualtrics. A five-point rating scale was used to determine the panelists’ level of agreement (strongly disagree to strongly agree). In agreement with Conner, Roberts and Harder (2013), it was determined a priori that at least 80% agreement would be needed to identify what overarching concepts should be included in the AFNR career cluster to internationalize the secondary agricultural curriculum. We also sent electronic notices and follow up reminders to encourage participation from the panel members (Dillman, Smith, & Christian, 2009).

**Results**

Round 1 consisted of a single open-ended question: “What overarching concepts should be included in the AFNR career cluster to internationalize the secondary agricultural curriculum?” Fourteen panelists (82%) provided 47 concepts, which were placed into 5 categories: Production, Business, Culture, Environment, and Miscellaneous. Round 2 used a researcher-developed survey. Fourteen panelists (82%) completed the survey, resulting in 34 concepts that were retained for Round 3. Upon conclusion of Round 3, fourteen panelists (82%) elected to retain 23 overarching concepts that should be included in the AFNR career cluster to internationalize the secondary agricultural curriculum. The 23 agreed upon concepts include: (a) Challenges of food distribution, (b) World agricultural commodity production, (c) Global food systems and preferences, (d) Land suitability and farming practices around the world, (e) Identify the varying degrees of mechanization in production agriculture, (f) Global GMO usage, (g) Overview of food security in different countries, (h) Overview of food production rates in different countries, (i) Impact of exports on US economy, (j) Impact of imports on US economy, (k) How free trade agreements impact US agriculture, (l) Agriculture industry's global workforce effects supply and demand, (m) Impact of political conflicts on the world market, (n) Overview of cultures in different countries, (o) Cultural effects on trade, (p) Cultural effects on marketing, (q) International career opportunities in agriculture, (r) Differing views on GMOs, (s) How global
climates impact food production, (t) Global role of water use in agriculture, (u) Impact of the world food demand on the environment, (v) Differences of developed and developing countries, and (w) Differences of developed and developing countries.

**Recommendations and Implications**

Findings from this study suggest there are many overarching concepts that should be incorporated into the AFNR career cluster in order to internationalize the secondary agricultural curriculum. Curriculum specialists should use this list of international agricultural concepts in order to internationalize the secondary agriculture curriculum. Additionally, secondary agriculture teachers should use this list as a tool to begin to internationalize their secondary agriculture program. We recommended to focus on one overarching concept at a time. This will help prevent secondary agriculture teachers from becoming overwhelmed, thus deciding to give up on the internationalization of their secondary agriculture program. Future research needs to be conducted in order to move beyond overarching concepts and to identify and develop specific learning objectives, specific content, and specific learning outcomes.

**References**


The Influence of Culture on Organizational Culture: Preferences within a Cross-Cultural NGO

Jennifer Strong
Texas A&M University
2116 TAMU
College Station, TX 77843-2116
979.862.1423 (phone)
979.862.7190 (fax)
dr.jen@tamu.edu

Joelle Muenich
Texas A&M University

Keywords: Organizational Culture, NGOs, Organizational Effectiveness, Cross-Cultural Leadership

Introduction

A recent article in Harvard Business Review stated, “companies don’t go global, people do” (Cliffe, 2015, p. 82). This research stressed the importance of understanding cultural differences before organizational work should occur. In order for international extension educators to truly be effective, they must understand not only the culture they are working in but also how that culture influences the interworking of the organization they are serving (Strong & Harder, 2011).

The concept of organizational culture originated from the organizational development model, and as the research progressed, scholars began to identify organizational culture as a leadership tool rather than a novel concept (Lewis, 1996). The term, however, is one that does not have a single, agreed upon definition by scholars (Frontiera, 2010) because the study of organizational culture can involve many different aspects of culture (Yiing & Ahmad, 2009), and adding the complexity of cross-cultural (international) leadership increases the dimensions of study.

Schein (2004) offers a broad definition of organizational culture that encompasses both the ideational and materialist aspects by identifying three levels of culture: artifacts, espoused values and beliefs, and basic underlying assumptions. Artifacts are the surface level phenomenon that one can easily see and observe. The second level of organizational culture, espoused beliefs and values, are the beliefs that guide and shape the members understanding of what ought to be acceptable behavior within the organization. Finally, basic underlying assumptions are the third and deepest level of organizational culture. At this level of culture, unconscious assumptions reinforce group norms and determine how members of the organization think, feel, and act (Schein, 2004).

Purpose and Objectives

The primary purpose of this study was to analyze the organizational culture of a non-profit organization, H.E.L.P., in order to better understand the context for further analysis of cross-cultural leadership behaviors. After analyzing the organizational culture, the Global Leadership and Organizational Behavior Effectiveness (GLOBE) (Hofstede, 1994) study
findings were used to provide a cultural explanation for variations in organizational preferences. The GLOBE study is considered the most comprehensive cross-cultural leadership study conducted to date.

The research objective of this study was to analyze H.E.L.P’s culture based on Schein’s (2004) operational levels of culture.

Methods

When studying culture, Geertz (1973) recommended researchers should deeply explore each layer. A qualitative, single case study approach was chosen to investigate the complex thoughts, feelings, and actions of individuals that characterize organizational culture (Klenke, 2008).

Operational construct and intensity sampling methods were used in selecting this case. Patton (2002) identified operational construct sampling as utilizing real world examples and intensity sampling as selecting cases specifically for their valuable examples of the phenomena being studied. H.E.L.P was selected for its distinctive relationship between the American and the Nigerian board of directors and employees, which creates a unique example of cross-cultural leadership. Semi-structured interviews, observations, and document analysis were used for data collection and provided triangulation (Patton & Appelbaum, 2003).

Results and Conclusions

An analysis of H.E.L.P’s organizational culture at the artifact level revealed a business-like structure with centralized authority that is highly compartmentalized. Congruent with Wallach’s (1983) definition of bureaucratic cultures, H.E.L.P places a strong emphasis on hierarchy and compartmentalization and “clear lines of responsibility and authority” (p. 32). There is also an observable level of employee discontent within the organization. The Nigerians prioritized harmony, unity, and caring for the general well-being of employees – all characteristics of a supportive culture as define by Wallach (1983). A significant conflict of preference in organizational structure is evident in the data. Finally, at the first level it was determined that H.E.L.P promotes the Christian faith in the members’ behaviors and observable rituals as well as through published materials such as the mission statement, goals, and newsletters.

At the second level of organizational culture, Americans shared an espoused belief in efficiency while Nigerians shared an espoused belief in love and support. An explanation for the difference between the American’s desire for efficiency and business-like structure and the Nigerian’s desire for supportive and harmonious organizational culture could be the difference in national cultures. The American’s preference for a bureaucratic organizational culture supports results from the GLOBE study, which found American to be a higher “performance orientation” (PO) society (Hofstede, 1994). The bureaucratic organizational culture parallels the characteristics of a higher PO society that values results above people, ambition, and competitiveness. Also at this level, an espoused belief in Christian faith was shared by Nigerians and over half the Americans interviewed.

While some espoused beliefs, such as the Christian faith, are held in common by both Nigerians and Americans in H.E.L.P, other values and beliefs held by Nigerians and Americans are not in congruence. The impact of national culture on member’s preference of organizational culture typology must be considered by founders and leaders of organizations like H.E.L.P for expectations and execution to match up, minimizing conflict arising from these differences. An
individual’s national cultural values will be reflected in their interactions within an organization and will undoubtedly influence the organizational culture (House, Hanges, Javidan, Dorfman, & Gupta, 2004).

**Recommendations**

Ultimately it is the role of the leader to create and perpetuate an organizational culture that will successfully carry out the mission of the organization while simultaneously contributing to employee satisfaction and commitment. Understanding the impact international cultural differences can have on organizational culture and effectiveness is paramount for those who take on the change agent/educator role at the international level. It is recommended that international extension educators replicate this study within their own organizations to assess the levels of culture (Schein, 2004) in order to build a deeper understanding of their organization.

**References**


Improving the Effectiveness of Farmer Exchange Visits: Perspectives from rice farmers in four villages of Madagascar

Elsie Black  
Cornell University  
405 N. Geneva St., Ithaca, NY 14850  
425-478-1540/eb622@cornell.edu

Terry W. Tucker  
Cornell University

Keywords: participatory extension; farmer to farmer; farmer exchange visits

Introduction
This paper will address the shortcomings of standardized farmer to farmer (FtF) extension and exchange visits, and propose strategies for organizing and facilitating FtF knowledge exchange before, during, and after exchange visits so as to more fully account for various dimensions of context. The study was carried out in Madagascar, where collaboration between Catholic Relief Services (CRS) and a Peace Corps Volunteer (PCV) highlighted the importance of a nuanced and culturally sensitive approach for increasing the effectiveness of exchange visits.

Popularized by the Farmer First “movement” in the 1980s, FtF gained acceptance across a wide range of organizations engaged in small farm extension and advisory service provision (Chambers et al, 1987). FtF extension relies on peer learning to reduce the social and cognitive “distance” among parties in knowledge exchange (BenYishay & Mubarak, 2013) and also to more fully account for local context, especially the specific agro-ecological knowledge and socio-cultural determinants of local farmer practice. The focus of this paper is farmer exchange visits, a form of FtF extension that relies on farmer knowledge sharing during the visit and farmer-led post-visit dissemination. Although the FtF extension approach is typically viewed as conceptually simple, it is too often practiced without full and nuanced attention to how context and program design influence impact.

Purposes and Objectives
This study identifies what farmers value in peer learning and exchange visits, how they share, use, and adapt new knowledge and field observations, and how a facilitating NGO can best support farmers throughout the process for maximum effectiveness. In addition, it examines how a specific socio-cultural and agro-ecological context influences the learning, adaptation and uptake of newly observed management practices. The original intent of the study was to inform future FtF initiatives of CRS, however the authors believe that the insights gained have value to other organizations.

Methods
The study relies on 48 semi-structured farmer interviews conducted in the local language (the Betsimisaraka dialect of Malagasy) in four villages in the northeastern Analanjirofo region during July 2015. All interviewees had participated in at least one of seven exchange visits conducted in 2013-2014. Each cross visit involved from 16 to 44 farmers. Participants visited
other farmers, farmers’ membership organizations, and local extension offices. These interviews took place one year after the program concluded which allowed for two full growing seasons for farmers to internalize, adapt, and/or adopt the practices they saw on the field trips.

Interview topics reflect literature documenting similar studies and assessments of farmer-to-farmer learning and farmers’ associations (Tripp et al., 2005; Nathaniels, 2005; Valdivia et al., 2010; Franzel et al., 2011; Bebbington, 1999). CRS contributed to study design anticipating that findings would inform future cross visit programming. The research questions centered around three themes: the substance and structure of the visits; post-visit knowledge sharing, adoption and adaptation of new ideas; pre- and post-trip support from the NGO.

Two interviewers, one Malagasy field assistant from the same ethnic group as the farmers and a returned PCV conducted all interviews. The PCV worked with CRS during program implementation and is familiar with the communities and participants. During the interview process the team stayed in each village for two to five nights which allowed for additional observations and unstructured conversation. Interviews were transcribed and coded for theme analysis and recommendations come from the synthesis of individual farmer comments.

Conclusions

Patterns in farmer responses revealed the importance of cultural characteristics in designing effective farmer-to-farmer cross visit programs in this region of Madagascar. Farmers were most likely to adopt ideas and technologies that they saw being practiced by regional farmers in similar agro-ecological conditions and of similar social status. Visits to other regions were more useful for exploring new ways of social organization and management. Multi-village cohorts demonstrate greater peer exchange, learning, and satisfaction than single-village cohorts. For initial participant selection, respondents prefer to have basic eligibility set by the cross-visit organizer, in this case the NGO CRS, and then participants are chosen transparently by community members. Communities described their own systems for fair and equitable selection. Outsider-imposed processes generated jealousy and mistrust which in turn negatively impacted adoption and dissemination of new ideas. To optimize the multiplier effect of exchange visits representatives should be selected from the social groups that form participants’ knowledge network. Farmers expressed that follow-up to the exchange visits was as critical to the adoption and spread of new ideas as the initial visit itself, and that for maximum effectiveness these visits should be a part of a sustained project rather than isolated events. Public recognition and legitimization of experiences in the eyes of peers is essential for successful dissemination and adoption.

Recommendations and implications

Critical design elements for the exchange visits include group composition and selection processes, pre- and post-travel assessment of participant interests and expectations, material and technical program support for farmers seeking to adopt new practices, encouragement and facilitation of post-visit knowledge sharing. Beyond the program-specific recommendations and suggestions for improvement, the paper supports extension planners and practitioners by sharing case-based examples of design elements that should be adapted to particular socio-cultural and agro-ecological contexts. For many program managers there exists a tension between efficiency and timeliness that accompanies standardized programming and a more time-consuming, participatory processes intended to gain stakeholder buy-in and sustained impact. However, this study suggests that FtF programs that reflect clear understanding of context, participant
priorities, and factors constraining adoption demonstrate greatest project outcomes. The paper also confirms the critical importance of participant perspectives and recommendations for the improvement of exchange visits in a unique context.

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Information Needs and Information Seeking Behavior of Agriculture Extension Agents: A Case Study in the North Central Province, Sri Lanka

Kumudu P. P. Kopiyawattage
Graduate Assistant
Agricultural Education and Communication
University of Florida
PO Box 110540
Gainesville, FL 32611
kumudupdn@ufl.edu
352-273-3425
352-392-0502 Fax

S.M.C.B. Karalliyadda
Lecturer
Department of Agricultural Systems
Rajarata University of Sri Lanka
Sri Lanka
Chinthbk@gmail.com

T. Grady Roberts
Professor
Agricultural Education and Communication
University of Florida
groberts@ufl.edu

Laura A. Warner
Assistant Professor
Agricultural Education and Communication
University of Florida
lsanagorski@ufl.edu

Keywords: Information seeking behavior, agriculture extension, Sri Lanka

Introduction
Agriculture contributes about 11% to the total GDP of Sri Lanka while more than 40% of the populations’ main livelihood is agriculture and related enterprises (World Bank, 2013). Information plays an important role in agriculture, hence an understanding of what, how, and when information is sought and used by extension agents is necessary in order to ensure farming communities receive appropriate information on time (Brodeur, Higgins, Galindo-Gonzalez, Craig, & Haile, 2011). This understanding may also help in planning and organizing extension delivery methods. There have been several studies conducted on the information needs of extension agents in different parts of the world (Agnew, 1991; Burns & Anderson, 1973). However, studies on the information needs of extension agents in Sri Lanka is very limited.
Purpose and Objectives

The purpose of this study is to explore the information needs and information seeking behavior of agriculture extension agents in Sri Lanka. Specific objectives of the study are to answer following research questions:

- What are the information needs of agricultural extension agents?
- What are the information seeking behavior patterns of extension agents?
- What role do extension agents play in disseminating agricultural information?

Methodology

This study examined the agricultural information needs and information seeking behavior of public sector agriculture extension agents ($N = 45$) in Anuradhapura provincial region of Sri Lanka. A questionnaire was administered face-to-face to collect data. Validity of the questionnaire was confirmed by experts in agricultural education and extension.

Results and Discussion

The majority of respondents (49%) were between 18-29 years old and 47% were male while the rest 53% are females. Among respondents, 64% have less than 5 years of work experience and 32% were recently employed with less than one year experience. This high percentage of new extension agents is a good indicator of the potential for a better future in agriculture because they are imperative for an economically viable country (Russell, 1993). About 87% of the respondents held agriculture diplomas and 13% had Bachelor’s degrees in agriculture. The type of information required by extension agents had no specific discipline, lower preference is given to animal-husbandry related information. Soil fertility, irrigation and drainage, plant disease and pest, post-harvest technology, and crop protection were the most highly demanded information needs followed by policy developments (62%), and advisory information (71.7%). About 95.6% of respondents indicated they were interested in receiving information in agriculture marketing which is extremely important to the agriculture sector in Sri Lanka because agricultural marketing information is important in promoting food security by helping farmers to identify trading opportunities (FAO, 2005). Perera and Silva (2012) reported that market oriented agricultural practices were poor among farming communities in Sri Lanka, hence farmers were unable to receive economic benefits.

Respondents overwhelmingly indicated they preferred print (84%) to electronic information (16%) sources. Proximity and format seem to play a significant role because 42% of the respondents stated department collections as their first source when in need of information followed by 27% personal collections, and 13% colleagues. Interest in consulting Internet (11%) and library (7%) were comparatively lower. This could be because 88% stated they do not find the information they are seeking from the library and more that 90% responded they do not have internet, e-mail, online electronic journal and fax access in their offices. When the respondents were asked about their main reasons for searching for information, 100% stated they require information to assist farmers. Respectively 69%, 47%, 16%, and 16% needed information for general awareness, to help other extension workers, to help researchers, and to conduct their own research. Respondents were asked about the relative importance of information sources. Respondents gave higher importance rate to books (69%), reading leaflets (66%), meeting with a knowledgeable person (52%), and Internet sources (57%). Preference to research reports (46%) and journal articles (29%), thesis or dissertation reports (23%), referring library (21%), and e-mail (27%) were comparatively lower. Preference given to information sources was very much
similar to the frequency of access of those sources. Access to research-based information sources such as journals (25%), research reports (16%) conference proceedings (15%), and technical reports (40%) is very low with compared to books (77%), leaflets (67%), and professional meetings (50%).

**Implications, Conclusion and Recommendations**

According to a study on information needs and information seeking behavior of farmers in Anuradhapura district, Sri Lanka (Perera, Roberts, & Warner, 2015), information required by farmers and information required by extension agents are similar. Even though extension agents seem to prefer printed sources over Internet and personal discussions with subject matter specialists, it is unknown if libraries are adequately equipped with timely information to address the needs of extension agents. Lack of Internet access could explain why extension agents do not tend to seek information from journals and internet sources. The Department of Agriculture also conducts annual agricultural conferences to release new research even though this information source is underutilized. This could be one reason why research information does not reach farmers, because extension agents do not utilize them and they do not have facilities to access them.

This study need to be replicated in other parts of the country to explore whether there is any similarity or difference between the information seeking behavior, information needs and other challenges extension agents face to receive information. The findings of this study should be shared with decision-making authorities of Department of Agriculture to promote action to produce and deliver educational materials based upon the needs of extension such as providing internet access facilities, making research journals available to extension agents, facilitating libraries with up-to-date information related to agriculture (books, magazines and other reading materials) and encourage agriculture agents to use them.

**References**


An Innovative Way to Preserve Natural and Cultural Environments: The Case the Maya Itzà

Taya Brown  
Graduate Student  
Texas A&M University  
Whownantsteriyaki@gmail.com  
206-790-4850

Theresa Pesl Murphrey  
Faculty  
Texas A&M University  
College Station, Texas 77843-2116  
t-murphrey@tamu.edu  
979-458-2749

Keywords: Preservation of Culture, Local Development, Natural Environments, Case Study

Introduction

The preservation of natural environments and cultural heritage is a continuous and enduring dilemma. Economic hardship and conflict faced by developing countries lead to and exacerbate the abuse of natural resources. Guatemala is one such country. Recent conflict, governmental and economic problems, and general instability have made it challenging for Guatemalans to preserve the surrounding natural environment. Such is the case of the Maya Itzà of San Jose, Petén in Guatemala. Poaching of endangered plants and animals and deforestation are rampant in the area; the jungle and its inhabitants (many of them endangered or endemic species) are rapidly disappearing, and cultural heritage along with them. Indigenous culture is often intertwined with the natural setting; therefore, a loss of nature equates to a loss of unique cultural characteristics of the local people (Seeland, 1997). Crasborn and Navarro (2011) define cultural heritage as “those material assets (both movable and fixed), customs, and traditions of a country, which have special value (archaeological, historical, artistic, or spiritual) and help strengthen national identity” (p. 2).

Creative approaches are needed to preserve the natural environments of developing countries, the biodiversity they hold, and the cultural identity of the people who inhabit them. Juska and Koenig (2006) state that, “human interest in visiting pristine areas and observing wildlife in its natural state has frequently been the driving force behind the protection of biodiversity” (p. 18). In Northern Guatemala it’s the large-scale archeological sites, and the tourism they bring in, that are encouraging such protection. The Asociación de la Reserva Indígena Biosfera Itzá (Bio-Itza) is a unique program established and managed by locals, which actively and successfully preserves both natural and cultural characteristics of the Petén region of Guatemala. It is the only protected area in the Petén that is managed by an indigenous community (Equator Initiative, 2012) and it is important to share their story with others and make their strategies known to those who might learn from this example. As noted by Heath and Heath (2010), “flashes of success – these bright spots – can illuminate the road map for action and spark the hope that change is possible” (p. 48).
Purpose and Methods

The purpose of this case study was to document a successful example of a creative approach to maintaining cultural heritage through preservation of the natural environment. The lead author was a participant in a language immersion program held at the Bio-Itzà bio reserve. The case study is a first-hand account of the experience at the reserve and documented aspects of the program that enabled success. The Bio-Itzà language immersion program and bio reserve is the phenomenon under investigation and is bounded by such (Merriam, 1998).

Results

The Bio-Itzà Association was established in 1991 with the goal to “rescue the ancestral knowledge and traditions of the Maya Itzà culture and associated tropical forests in northern Guatemala” (Bio-Itza, 2010, para. 1). The onsite visit to the reserve revealed that the association consists of a cooperative of Maya-Itzà families from San Jose, Petén with historical ties to the jungle; a 27 square kilometer bio-reserve, including an encampment where students can choose to stay while studying Spanish; a building in the town of San Jose that houses the central office and classrooms; and a medicinal plant garden. What makes the association unique is that it was established and is operated by locals.

Observation of the program revealed that the intent of the program was not only to provide language immersion services, but also to preserve the environment and culture. Programming efforts, such as the Spanish language school, enabled not only funding but also the education of those outside the local community. Firsthand experience on site at Bio-Itzà as a language student revealed that the association was actively involved in cultural preservation through jungle conservation efforts, cultivation of medicinal plants, and storytelling by elders in the community. For example, the elderly told of times when men were separated from their families nine months out of the year due to living in jungle camps to harvest chicle, a crucial ingredient in chewing gum and the main source of income at the time. Evidence of this exists in scars seen on the chicle trees throughout the reserve. The significant and critical role of Bio-Itzà was revealed in conversations with locals who emphasized the lack of government support to stop looters from stealing ancient artifacts from Mayan archeological sites or poaching endangered trees and animals. More details regarding the case study will be shared in the presentation.

Implications and Recommendations

Programs such as Bio-Itzà have the potential to greatly impact natural environments, have a positive impact on the preservation of culture, and are linked to the generation of positive, social and economic benefits for local communities (King & Stewart, 1996). However, without documentation of these programs, awareness of their effectiveness is limited. It is recommended that additional case studies be conducted to document aspects that enable this program’s success. Further, it is recommended that additional qualitative research be conducted including interviews with individuals at the location to further document the decades of management of the Bio-Itzà Bio-Reserve to enable communities with similar circumstances to learn from Bio-Itzà’s experience.

References

Intercultural Sensitivity of Extension Educators in Nigeria: A Descriptive Study

Bala M. Shehu
Department of Agricultural Leadership, Education and Communication (ALEC)
University of Nebraska–Lincoln
143 Filley Hall
Lincoln, NE 68583-0947
402-472-4042
bshehu@huskers.unl.edu

L.J. McElravy

Gina S. Matkin

Mark A. Balschweid
University of Nebraska–Lincoln

Keywords: Intercultural sensitivity, Extension Educators, Nigeria

Introduction
Nigeria is a multi-ethnic, culturally diverse nation with over 250 ethnic groups (Edewor, Aluko & Folarin, 2014). For this reason, it is essential for agricultural extension professionals to have intercultural communication skills and multicultural mindsets to design and implement effective programs for their diverse audiences. To be effective, educators must be interested in other cultures, be sensitive enough to notice cultural differences, and be willing to modify their behavior out of respect for people of other cultures. A reasonable term that summarizes these qualities is intercultural sensitivity (Bhawuk & Brislin, 1992). Chen and Starosta (1997) define intercultural sensitivity as: An individual’s ability to develop a positive emotion towards understanding and appreciating cultural differences that promotes an appropriate and effective behavior in intercultural communication (p. 6). This definition identifies intercultural sensitivity as a dynamic concept and a crucial element in the development of intercultural communication competence.

Purpose and objectives
The purpose of this study was to evaluate the level of intercultural sensitivity of Extension educators in Nigeria and to determine whether their personal characteristics influenced their level of intercultural sensitivity. The objectives were to:

- Determine the level of intercultural sensitivity of Extension educators in the head office of Nigeria’s National Agricultural Extension and Research Liaison Services (NAERLS) in Zaria.
- Determine if factors such as gender, age range, multi-lingual proficiency, level of education, area of specialization, training on dealing with diverse audiences, years of experience as an extension educator, and international travel experience influenced intercultural sensitivity of the extension educators.
Methods and Data Sources

Participants in this study were Extension educators stationed at the head office of Nigeria’s National Agricultural Extension and Research Liaison Services (NAERLS) in Zaria, Kaduna State. The scale used to measure the dependent variable of intercultural sensitivity was a 5-point Likert-type Intercultural Sensitivity Scale (ISS) developed by Chen and Starosta (2000). The ISS was chosen because its validity and functionality across cultures has been established by several studies measuring intercultural sensitivity. The 24-item scale has five constructs on which its statements are based: interaction engagement (7 items), respect for cultural differences (6 items), interaction confidence (5 items), interaction enjoyment (3 items), and interaction attentiveness (3 items). The 5-point Likert scale ranged from 1 = Strongly Disagree to 5 = Strongly Agree. Responses were scored to get the overall value for the “Intercultural Sensitivity” on the scale. According to Chen and Starosta (2000), higher scores suggest more intercultural sensitivity. A brief demographic questionnaire was also used to collected data on the factors in Objective 2.

A cover letter and research instrument were sent to the 61 Extension educators in the NAERLS head office. Educators were requested to return questionnaires within two weeks. A total of 43 completed questionnaires were returned, resulting in a response rate of 70 percent. Descriptive statistics were used to determine frequencies, means, percentages, and standard deviations. Analysis of Variance (ANOVA) was used to explore the relationship between independent variables (demographic data) and dependent variable (ISS).

Results and Conclusions

A post-hoc reliability analysis conducted on the responses to the ISS indicated acceptable reliability (Cronbach’s alpha = 0.82). The average ISS score for the Extension educators was 95.70 (SD = 8.75) out of a possible 120 points, meaning educators on average “Agreed” (M = 3.99, SD = .81) with the statements in the scale. Table 1 presents the demographics of the Extension educators. Table 2 displays their ISS score by demographic variables.

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<td>99.00</td>
<td>na#</td>
</tr>
</tbody>
</table>

Table 2

**ISS Score by Demographic Variables**
The level of Extension educators’ intercultural sensitivity did not vary with their age, gender, multi-lingual proficiency, level of education, area of specialization, training experience with diverse audience, or international travel experience. However, this study revealed that Extension educators with five or more years of work experience in extension were more interculturally sensitive compared to the educators with less than five years of work experience (Table 2).

### Educational Importance and Implications

The findings from this study indicate that the multi-ethnic and culturally diverse context in which extension education is exercised in Nigeria, may provide Extension educators with opportunities to develop and nurture their intercultural sensitivity. While this study can only draw inferences about intercultural sensitivity and factors affecting intercultural sensitivity of Extension educators in the NAERLS head office, the study can provide reference points for researchers and others on intercultural sensitivity worldwide.

### References


Interests, Ideas, and Income: Reflections of 4-S Children in Rural Nicaragua

Carla Andrea Millares Forno
Graduate student
Department of Agricultural Education and Communications
Texas Tech University
15th and Detroit Ave, Box 42131
Lubbock, TX 79409-2131
Phone: (806) 549-1528
Fax: (806) 742-2880
Email: Carla-andrea.millares@ttu.edu

Amy E. Boren
Assistant Professor
Texas Tech University

Keywords: Children, 4-S clubs, Communities, Nicaragua, empower

Introduction
Programs that focus on the positive development of youth and children are very important for communities because they foster contributions to the community and diminish the likelihood of problem behaviors in youth and children (Jelicic, Bobek, Phelps, Lerner, & Lerner, 2008). An example of such a program in the United States, is 4-H. Studies have indicated significantly higher performance of members involved in 4-H across a plethora of prosocial variables when compared with those who are not part of the program (Gestsdottir & Lerner, 2007; Jelicic, et al, 2008; Hershberg, DeSouza, Warren, Lerner, & Lerner, 2014).

In Latin America, many countries have replicated the 4-H program under the title 4-S. The purpose of 4-S clubs is to strengthen the positive development of members with an emphasis on the following purposes: To increase agricultural production, to raise health and living standards of the members, as well as improve the conditions of their families and communities (Inter-American Institute for Cooperation on Agriculture [IICA], 1997).

In Nicaragua, the 4-S program was introduced in the mid-1950s (IICA, 1997). The program flourished for more than 25 years, but due to civil war, the 4-S program was dismantled in the late 1970s. Although efforts to reinstitute 4-S in post-war Nicaragua were undertaken in 1990, the country’s peace was still too fragile to support the program, and it disappeared completely in 1993 (IICA, 1997).

After nearly 20 years in dormancy, the idea of reintroducing 4-S clubs in Nicaragua was implemented by Fabretto, an organization dedicated to empowering underserved children and their families through education, nutrition, and economic opportunity (Fabretto, 2014). The first 4-S club organized by Fabretto began in 2012; currently the program has fifteen 4-S clubs for primary and secondary school students (C. Aguirre, personal communication, June 10, 2015).

As the 4-S program in Nicaragua is in its nascent phase, understanding young people’s interests in participating in 4-S and how they believe they can help their communities is critical for the 4-S leaders who are running the programs.
Purpose

The purpose of the study was to understand 4-S club members’ interests and ideas for helping their communities in rural Nicaragua.

Methods

Open-ended questions were used for this study. The participants were asked to read four open-ended statements, think about them, and then respond in their own words (Ballou, 2008). The use of open-ended questions was selected to encourage the participants to provide authentic responses reflecting their personal beliefs (Ballou, 2008).

Four sentences were completed by ninety-four 4-S members between the ages of 9 – 13 in four different communities from two states in northern Nicaragua: Madríz and Nueva Segovia. Completed items were coded and grouped in specific categories (Ballou, 2008). Frequencies and percentages were calculated to determine the participants’ interests and ideas for helping their communities. Responses then were compared between clubs and related to the socio-economic situation prevailing in those areas.

Credibility, transferability, dependability, and confirmability were used as standards of rigor in the research (Ary, et.al. 2010).

Results

To shed light on club members’ interests and ideas, a list of responses from each club was created, highlighting the responses with the highest frequency from each community. The responses that garnered the highest frequency from each of the communities were the following:

- I am curious about: Entrepreneurial activities, culture and art, and agriculture
- We can help our community through: Recycling, cleaning, and doing social work
- My hobbies are: Playing with friends, working, and culture and art
- Just for fun we could: Do entrepreneurial activities, cultural activities and art, and practice sports.

Regarding participants’ curiosities, responses with the highest frequency were related to entrepreneurial activities, such as making and selling artisanal handiwork. Cultural identity was also considered very important, including dancing, singing and cooking. Children also expressed an interest in learning more about agriculture, as this is the principal economic activity in this region.

With respect to helping in the community, children expressed their interest in recycling, cleaning and reforestation. This could be because these communities either lack basic sanitation services, or the services are intermittent. The accumulation of garbage and lack of a recycling system are common problems. Members also consider protecting the environment to be important. This could be because trash is burned or dumped in local rivers, polluting the local area, and other, similar practices. Also, trees are cut and used for fuel without replanting, jeopardizing the environmental health of the communities. Finally, children believe it is very important to do social work, such as caring for the elderly and the ill.

Among the hobbies indicated by the participants, playing with their friends is their highest frequency response. Children of these communities engage regularly in group activities with their peers, mainly playing traditional games. Interestingly, children mentioned working as their second most frequent hobby. This involves practices such working in agriculture and helping at home. Children also mentioned practicing culture and art as their third most frequent hobby.
For fun, children indicated entrepreneurial activities as the most fun. They expressed a zeal for creating things they can sell. Many of these entrepreneurial activities are done as a group with other young people in order to socialize as well as generate income that is shared among group members. Children also indicated that playing sports was another activity they do for fun.

**Conclusions and Recommendations**

Children from the 4-S clubs in northern Nicaragua expressed similar interests and ideas regarding their participation in 4-S and in helping their communities. Their responses reflect the realities of their daily lives. They want to conduct entrepreneurial activities mainly because they feel responsible for contributing to their families. They want to have fun, but look for ways to integrate fun into income-generating activities. Because the communities in this study have a strong indigenous heritage, the preservation of culture was important. Understanding 4-S members’ interests and ideas can serve local 4-S leaders as they seek to crystallize group norms and activities of the fledgling 4-S program in Nicaragua.

**References**


Investigating the Impact of Social Capital, Innovation Characteristics, and Gender on Adoption of the Hydraulic Injector Fertigation Technology in the Jordan Valley

Mary T. Rodriguez, Ph.D.
Ohio State University
204A Ag Admin Building, 2120 Fyffe Rd
614-247-6001
rodriguez.746@osu.edu

T. Grady Roberts, Ph.D.
University of Florida

Amy Harder, Ph.D.
University of Florida

Muthusami Kumaran, Ph.D.
University of Florida

Sandra Russo, Ph.D.
University of Florida

Keywords: Adoption, Diffusion of Innovations, Social Capital, Gender

Introduction

Food security is at the forefront of many conversations amongst development and extension practitioners. As populations increase, stress on food systems also increase (Population Action International, 2011). The population of the Middle East North Africa (MENA) region is expected to double by the year 2050 (International Food Policy Research Institute, 2010). This region faced immense challenges due to conflict, lack of water resources, and climate change, all of which greatly impact the food security status of its people (IFPRI, 2010). Jordan, in particular, has about 2.4 percent of its population that is food insecure and vulnerable (World Food Programme, 2015).

There is no easy answer to solving food insecurity; it requires an integrated approach. In order to decrease the undernourished millions of people, there needs to be investments to increase agricultural productivity (IFPRI, 2012). As a part of the research in agricultural technology and development, there have been many efforts to maximize efficient use of water resources and fertilizer application. Jordan has been using fertigation technologies, the application of fertilizers into irrigation water, for several years (Hagin, Sneh, & Lowengart-Aycicegi, 2003). Further improving the technology, more effective hydraulic injectors for fertigation were designed and demonstrated to farmers in the Jordan Valley. Despite its advantages, the hydraulic injector fertigation technology has not been widely adopted.

Purpose and Objectives

The broad purpose of this study was to explore the adoption process of hydraulic injector fertigation by farmers in the Jordan Valley. The specific research objectives were to see how adoption of the hydraulic injector technology is impacted by:
1. Rogers’ innovation characteristics
2. Social capital
3. Innovation characteristics and social capital
4. Gender

Methods

This study was conducted as a case study of farmers in the Jordan Valley. Case studies allow for this targeted focus on a process (Merriam, 1998); in this case, adoption of the hydraulic injector fertigation technology. The complexity of this study called for an appropriate use of mixed methodology. This research followed a sequential, triangulation mixed methods design (Creswell & Clark, 2007). This particular design brings together the strengths of both qualitative and qualitative research so as to present a holistic picture of the phenomena. Farmers in the Jordan Valley, with the potential to adopt fertigation, were the population for this study.

The quantitative segment of the study followed a correlational, non-experimental design to explore the levels of adoption and social capital of farmers in the Jordan Valley. The questionnaire was developed by adopting an instrument measuring innovation characteristic created by Moore and Benbasat (1991) and an instrument measuring social capital created by Narayan and Cassidy (2001). A panel of experts reviewed the questionnaire to ensure content validity and Chronbach alphas were calculated ex post facto for each construct. Quantitative data were collected through a researcher developed questionnaire verbally administered to 100 farmers in the Jordan Valley.

Quantitative data were also collected through four semi-structured focus groups with farmers in the Jordan Valley. Focus groups allow for the social construction of knowledge to be observed. It lets people give ideas, corroborate, or dispute those ideas (Flick, 2009). Three focus groups were conducted with male farmers that adopted and did not adopt fertigation as well as one with a woman’s cooperative.

Results

Results, briefly stated here, were demonstrated through both quantitative and qualitative findings. Farmers are familiar with every type of fertigation technology, including the hydraulic injector. However, use and knowledge of the technologies differed. Adoption characteristics as a whole were not found to be significant with this population. However, complexity on its own did influence adoption of the hydraulic injector. In addition, social capital was found to be a significant predictor of adoption. Trust, and more specifically linking capital, were found to be significant as well. Analyses also were conducted to investigate the interactions of the innovation characteristics and social capital together on adoption. Here, observability, trust, and group characteristics were found to be significant. Finally, the role of gender in the adoption of the technology was shown through qualitative data findings. Women were found to be working on the farms but not owning/managing them. They had gender-specific farm duties and found opportunities associated with group membership including skills acquisition, loan opportunities, and courage to speak up in household decisions.

Implications & Recommendations

Observability, group characteristics, and trust (more specifically linking capital) were found to influence adoption of the hydraulic injector technology by farmers in the Jordan Valley. Rogers (2003) and many others have made clear the importance of the perceptions that potential
adopters have of an innovation’s characteristics. This study provides perspective about Rogers’ (2003) social system and its impact on adoption. In this study, farmers stated that they often look to other farmers for advice and information. The importance of understanding the impact that other farmers have on adoption is invaluable to people working to diffusion technologies. Understanding farmers’ social dynamics and people that influence their choices can help to target diffusion efforts.

Several recommendations were given to the extension and researchers working in Jordan. In taking into consideration the impact that the perceived characteristics of an innovation and social capital can have on adoption, extension agents and researchers can work together to develop technologies and dissemination efforts that could encourage further adoption by farmers in the Jordan Valley. Furthermore, learning about the social dynamics of the target population can help extensionists know where to focus their efforts for information distribution. Likewise, if an extensionist wishes to help a community or a group of farmers (men or women) strengthen their community ties and expand their opportunities, social capital must be fostered and increased. Raising a community’s or a group’s social capital can pave the way for the growth of other types of capitals, such as human and financial capital. Social capital helps to create linkages that can introduce potential opportunities which could dramatically increase their quality of life and possibly reduce household poverty. Learning more about technology adoption can make the difference for increasing familial household food security through increased production.

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It’s Time to Learn: Creating an Extension Qualification to Meet South Africa’s Dynamic and Complex Agricultural Sector

Dr. Steven Worth
University of KwaZulu-Natal
P/B X1, Scottsville, KZN, South Africa, 3290
Tel: +27 33 2605792
Email: worths@ukzn.ac.za

Keywords: Extension curricula, Extension Education, South Africa

Introduction
South African agricultural extension has long struggled to find its footing in a rapidly changing agricultural sector characterized by imbalances in access to land and the factors of agricultural production, with the majority of the resources held by the minority (white) farmers. Land reform and support to (black) smallholder farmers were the key strategies to address these imbalances (Department of Agriculture (DOA), 1995; National Planning Commission, 2011). But the public extension service was incapable of addressing the manifold issues faced by smallholder farmers (Worth 2008). Research was conducted to identify factors contributing to this failure.

Among the issues identified was the training of extension practitioners who were found to be ill equipped to meet the demands of South Africa’s agricultural transformational agenda. The research pointed, among other things, to extension curricula in tertiary education. This became the focus of a multi-stage, multi-year study examining several qualifications used when recruiting public-sector extension practitioners. The meta-study involved 17 tertiary institutions – six universities, nine colleges of agriculture and one university of technology (Worth, 2008).

The aim of the meta-study was to document the presence and evaluate the nature of agricultural extension in higher education curricula and to propose a new theoretical framework for extension curricula. The aim was further to develop a scaffold for extension qualifications that would produce extension practitioners who could meaningful participate and contribute to the transformation of South African agriculture. This paper is a subset of the meta-study.

Purpose and objectives
Within the framework of the meta-study, specialized studies were conducted at three of the colleges and two of the universities included in the main study to refine the learning and begin the scaffolding process. This paper reviews the findings of the specialized study conducted for the University of Mpumalanga (UMP). It was conducted as a part of the preparations for launching the university in 2014. The aim of the study was to determine the most appropriate extension qualification to be UMP’s first agricultural degree. In addition to its own data, the study also drew from the main study and the study conducted at the three colleges (Worth, 2014a).

Methods
The study was conducted primarily at Lowveld Agricultural College which was to be incorporated into and form the backbone of UMP’s agricultural faculty. The study followed the Theory-led Instructional Design Curriculum Evaluation and Design method which follows a very
structured approach to evaluating and designing curricula (Worth, 2008).

The study used focus group discussions (Mwaijande, Miller, Wailes & Petersen, 2009) to engage lecturers from all disciplines at Lowveld and other key informants to probe qualifications at the level of theory; identify key competencies expected of graduates; translate competencies into learning outcomes; and use the outcomes to interrogate existing programs (Worth, 2008). Over 40 respondents participated in the study, which was spread over several months.

Data was descriptive in nature. Interpretation was guided by higher education policy, which sets the parameters and regulatory conditions for tertiary qualifications (DHET, 2013) and by extension policy setting out the state’s expectations for extension practitioners (DOA, 2005).

Results

The meta-study had found that the theoretical premise of South African extension for both curricula and practice was narrowly framed and embedded in technology-transfer drawing on behavioral change, communication and persuasion-based extension theory. Experience and research in other parts of the world suggested this was not sustainable, particularly in a country in a state of transition. Similar to the findings of Duo and Bruening (2007), the study argued for broadening the theoretical premise with primacy being given to learning rather than content (Worth, 2008).

The UMP study found that the most appropriate qualification was the three-year, 360-credit Bachelor of Agriculture structured on the Agriflection concept (Worth, 2006) and the Extension Carousel (Worth, 2014b). The degree should be anchored in agricultural extension addressing the extension and social sustainability elements of the Carousel. It should be supported by four learning areas: Agricultural Production (addressing land, input supply and technology); Farm Business Management (addressing information, organizational capacity, and markets and marketing); Natural Resource Management (addressing land and environmental sustainability); and Farm Engineering (addressing infrastructure).

Lowveld’s curriculum was found to offer practical agriculture (as opposed to agricultural science offered in most South African agricultural degrees). The study further confirmed placing emphasis on developing knowledge and skills to build the capacity of farmers to learn (and acquire knowledge and skills) in terms of their farming operations and sustainability context which had been the original finding of the meta-study. It further confirmed the value of a coherent mix of theoretical and practical learning.

The study determined exit-level outcomes for each key learning area. They focused on applying the principles of extension to design and implement integrated extension programs to build farmer capacity in each learning area to improve their ability to engage with scientific enquiry which is seen as the primary learning process. The study further suggested that extension, as a discipline, should focus on Learning (the foundation); Innovation (the approach); Systems thinking (the framework); and Development theory (the context) for engaging with scientific enquiry – and provided learning outcomes for each.

Educational importance

The degree designed through this study was structured to help meet the demand for professionals capable of leading and managing agricultural extension through the complexities of agricultural transformation. It prepares them with a deliberate mix of extension, development and agricultural production and management competencies. The extension component is grounded in a learning paradigm; the technical component is grounded in a practice paradigm. This resonates
with both South African extension policy and the growing body of research driving extension into the space where farmer learning is the primary objective and measurement of agricultural development.

This fledgling degree at UMP, now in its second year of implementation (which will need to be evaluated against the claims it makes), offers a credible format for other such qualifications coupling theoretical (university) degrees to more practical (college) qualifications to generate unique qualifications that provide a balanced mix of theory and practice (head and hand), which is very much the arena in which farmers operate.

References


Knowledge of Nutrition and Perceptions of Healthy Foods in Northern Mozambique

Maggie Jo Hansen
205 Agriculture Building
University of Arkansas
Fayetteville, AR 72701
479-575-2035
Fax: 479-575-2610
mjpruitt@uark.edu

Leslie D. Edgar
University of Arkansas
Agricultural Education, Communications and Technology (AECT) Department
205 Agriculture Building
Fayetteville, AR 72701
(479) 575-6770
Fax: (479) 575-2610
ledgar@uark.edu

Keywords: Africa, Healthy Foods, Nutrition Knowledge, Perceptions of Food

Introduction

Low protein, starchy foods (maize, rice, wheat) comprised 80% of the Mozambican diet (FAO, 2011). Micronutrient intake is seasonal, but typically consists of green leafy vegetables that accompany the staple foods (FAO, 2011). New Horizons (NH), a for-profit poultry company, was established in Nampula, Mozambique, in 2005. The company provides local villagers with employment, which improves their quality of life.

Educational barriers may threaten the knowledge of nutrition. Nutrition knowledge among Mozambican household food providers is not directly linked to formal education, as one study reported mothers with high levels of nutrition knowledge acquired outside of school (Burchi, 2010). Development of effective communication strategies at the organization and individual levels are needed before nutrition knowledge can be established (Department of Health, 2013). The Social-Ecological Model describes individual change within the social change context (Gregson et al., 2001). This theory describes the social world in five levels of influence: social structure/policy; community; institutional/organizational; interpersonal; and individual. Although behavioral and dietary changes exist at the individual level, educational nutrition campaigns at the broadest levels (society, community, organizational) create changes that enable and strengthen individual change.

Purpose and Objectives

The purpose of this study was to determine nutrition knowledge among respondents and determine the need for an educational nutrition campaign. Three objectives guided this study: (1) assess perceptions of nutrition and healthy foods; (2) determine where participants’ learned about healthy foods; and (3) determine type and frequency of food consumption.
Methods

This study used mixed methods survey methodology to assess people in the rural Nampula region, in May and June 2015. NH averages 340 employees year; however, due to time restraints and seasonal employment, the study aimed to survey 30 employees and 30 nonemployees. Participants were identified through convenience sampling based on location, season, and availability. The survey and food list was adapted from previous research (Rose et al, 1999) where respondents reported household food consumption about most common foods, and modified by a panel of experts in food availability in rural Mozambique (n = 3). Content and face validity were maintained. Data collection occurred on iPads through Qualtrics Offline Surveys and, because of lack of Wi-Fi, were uploaded later into the online database. Face-to-face interviews were conducted in Portuguese or Makhuwa, and one translator assisted in each interview so responses could be recorded in English. Following data collection, audio recordings and survey responses were uploaded into an Excel spreadsheet and assigned a number based on interview order and labeled with an ER or NR based on their employee (ne) or non-employee (nn) status with NH. Emergent themes were determined based on systematic procedures outlined in Creswell (2009) and Lincoln and Guba (1985).

Results

The average household size for employees (ne = 30) was 6.20 family members, while the average household size for nonemployees (nn = 30) was 6.23. Employees (ne = 30) worked for NH on average for 4.73 years. When asked to define nutrition in his/her own words, 73.3% of respondents (ne = 16, nn = 28) could not provide an answer. Employees (ne = 14), who provided a definition, used keywords including consuming a variety of foods with many vitamins that provided power/energy. Respondents were asked what three foods were healthiest and why. Employees answered leaves (ne = 20), maize flour (ne = 19), and rice (ne = 8) most often. Nonemployees answered bananas (nn = 12), leaves (nn = 12) and papaya (nn = 8). When reporting why these foods were healthiest, eight respondents answered that it made him/her feel full or become fat. “Because when we prepare maize flour, the children feel satisfied,” ER9. Vitamins and energy were mentioned most often by respondents to justify their selection of healthy foods. One respondent (ER24) answered water, maize flour, and leaves as the healthiest foods because if his/her family couldn’t eat anything else, it was enough to survive. Participants were asked which foods they would buy more if money was not a limitation. Overall, rice had the most responses (n = 28), followed by beef (n = 18), and pasta (n = 17). Nonemployees preferred beans (nn = 10) and maize flour (nn = 9), while employees would purchase more milk (ne = 7). Respondents were asked how they learned about healthy foods for their families. Employees (ne = 16) reported that they learned this information at the NH training sessions. Employees (ne = 11) and nonemployees (nn = 11) reported they learned about healthy foods in school, while seven nonemployees found information at the hospital. Participants also learned from others including family and friends, while other respondents stated that this information was unavailable to them.

Respondents reported household food item consumption in eight food categories. The grains category had the most food items with 100% consumption among respondents. Maize flour, bread, rice, and pasta were consumed by each respondent’s (N = 60) family. All respondents reported consuming fresh and dried fish, as well as chicken and beef. However, employees consumed chicken and beef more frequently than nonemployees. All participants
reported eating mangoes when in-season. Affordable commodities were consumed by all respondents, whereas expensive commodities were not.

**Conclusions and Recommendations**

Participants could not consistently provide a definition of nutrition. Employees were able to define nutrition more often than nonemployees, potentially due to the NH training sessions. However, training content was not always nutrition-related. The majority of employees learned about healthy foods at the trainings; however, responses on where respondents learned about information were not consistent. Although school was the most frequent response \( (n_e = 11, n_n = 11) \), most Mozambicans do not attend school past third grade. Although respondents reported eating items from all eight food groups, the grains category had the highest consumption, supporting previous research (FAO, 2011). When discussing healthy foods, respondents often answered that foods were healthy because they/their children felt full, satisfied, or received power from consumption. Study findings led to key recommendations for NH to focus on developing training sessions that deliver consistent, key nutritional messages. Nutritional campaigns would influence knowledge from the organization to the individual.

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Laboratory Capacity Assessments for Burkina Faso, Ghana, and Gambia: Extension’s Role in Assisting Developing Nations Sell Food Beyond their Border

Robert Strong  
Department of Agricultural Leadership, Education, and Communications  
Texas A&M University  
600 John Kimbrough Boulevard, Room 231  
College Station, Texas, 77843  
Phone: (979) 845-1139  
Email: r-strong@tamu.edu

Thomas Hall  
Texas A&M University

Katlin D. Keppler  
Texas A&M University

Kirk Edney  
Texas A&M University

Nicole Ray  
Texas A&M University

Keywords: food laboratories, Borich assessment, food security, food safety, extension officers

Introduction and Review of the Literature

The importance of food and pesticide laboratories is continually increasing due to mounting societal concerns of food security as well as a growth in international trade of agricultural products (Sofos, 2008). The numerous risks create pressure for governments to implement advanced controls on safety and quality assurance to minimize these threats of food insecurity to consumers (Luning et al., 2009).

Needs assessments of agricultural laboratories identify areas requiring attention so that laboratories may have an increased efficacy in combatting global food security concerns (Lobell et al., 2008). Brazil’s Ministry of Agriculture conducted analyses on their National Agricultural Laboratories in response to the challenges worldwide population expansion have on food security (de Queiroz Mauricio & Lins, 2012). Food and pesticide laboratories who conduct needs assessments will be more effective in meeting food security standards internationally (Luning et al., 2009). Extension systems in Burkina Faso, Gambia, and Ghana have been mandated to oversee the assessment of food laboratories to assist the Ministries of Agriculture ensure that laboratories meet international requirements.

Purpose and Objectives

The purpose of this study was to review and evaluate the existence and effectiveness of official agricultural production laboratories in Burkina Faso, Ghana, and The Gambia. More specifically:
1. Describe Burkina Faso, Ghana, and The Gambia official laboratories’ perceived proficiency of laboratory performance topics; and

Methods
This study was conducted using a Borich needs assessment to provide quantitative synthesis of the data collected (Fraenkel, Wallen, & Hyun, 2012). Competencies assessed were the equipment and facilities, infrastructure, quality management, biological safety, laboratory safety, case load, efficiency analysis, and compliance capacities of the laboratories. There were \((N = 14)\) participants in the study and all were administrators of the respective laboratories. Through the use of the Borich needs assessment, the insufficiencies between current and desired situation were revealed. Participants of the study assigned a level of proficiency and importance to each of these items based on two four point scales for proficiency and importance: 1 = No Proficiency/Importance, 2 = Low Proficiency/Importance, 3 = Average Proficiency/Importance, and 4 = High Proficiency/Importance. The Borich needs assessment provided the advantage of the simplicity of employing the instrument, as well as the amount of data that may be collected and the resulting comprehensibility of the data (Borich, 1980).

Results and Conclusions

Given the space limitations of the abstract, the summative data from each of the respective laboratories is reported here. Half of the laboratories assessed showed a need for training in the area of waste management. The National Breeding Laboratory in Burkina Faso, Aflatoxin Testing Laboratory and Plant Protection Services, and the Department of Agriculture in Gambia’s assessments all show a need for training in decontamination or disinfection of disposable or waste products. The National Breeding Laboratory in addition to Noguchi Memorial Institute for Medical Research and Food Research Institute in Ghana displayed a need for training in the proper disposal of hazardous materials or other laboratory products.

The Noguchi Memorial Institute for Medical Research in Ghana and the National Breeding Laboratory required training in the importance of maintaining accurate records of autoclave operation. Both the Food Microbiology Control Testing in Gambia and the National Breeding Laboratory assessment concluded a need for education in periodic sterility testing of the autoclave, and all three laboratories had a need for training on the routine maintenance of the autoclave.

Noguchi Memorial Institute for Medical Research and the Food Research Institute in Ghana assessments showed the laboratories were deficient in providing proper eye safety equipment. The labs needed further training on the need for eye washes and eye protection, as well as how to correctly maintain and utilize the equipment respectively. These labs were also requiring training in ensuring the air handling system maintains negative laboratory pressure. Both labs in addition to Food Microbiology Control Testing in Ghana were in need of knowledge of the importance of labeling sampling containers by accurately including information regarding the collector’s name and location, date, and time of collection.

The Alfatoxin Testing Laboratory National Agricultural Research Institute and Plant Protection Services in Gambia both sought improvement in the area of standard operating procedures (SOP) for the correction of data, and Plant Protection Services required additional
instruction on analytical procedures of SOPs, as well as analytical procedures used in the
laboratory and their appropriateness for the matrices being tested.

The results of the assessments for Food Microbiology Control Testing in Gambia and
Noguchi Memorial Institute for Medical Research in Ghana showed both labs need training in
the topic of the importance of maintaining equipment and instruments, the laboratory in Ghana
wanted further instruction on the importance of calibration of the equipment as well. For both
labs, training was needed on the importance of periodic performance assessment of the
laboratory. The Noguchi Memorial Institute for Medical Research assessment called for an
overview of the importance of sample receiving, registration, and collection. The Food
Microbiology Control Testing in Gambia needed back-up power in case of a power outage.

Implications/Recommendations/Educational Importance

Extension systems worldwide may be asked to assist in the assessment of local food
laboratories in the future. A needs assessment will help better understand the deficiencies and
items of importance that food laboratories need to improve their standards. This is easy to
understand given extension officers’ proficiency at developing needs assessments, collecting the
data, understanding how to analyze the data, and reporting the information to internal and
international stakeholders. There are several qualitative needs assessment techniques that could
be used to assess proficiencies and items of importance for food laboratories beyond the Borich
model. The study underscores the importance of training extension officers for this added
responsibility. Regular in-service trainings in the assessment of food laboratories may be
necessary. Extension’s increasing role in some developing nations is perpetually increasing due
to international food security concerns (Sofos, 2008), and to minimize food insecurity to
consumers (Luning et al., 2009).

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Learner-Centered Education Driven by Constructivist Theory

Mary Halbleib  
Integrated Plant Protection Center  
Oregon State University  
2040 Cordley Hall  
Corvallis, OR 97331  
541-737-2683 (phone)  
541-737-3080 (fax)  
mary.halbleib@oregonstate.edu

Paul Jepson  
Integrated Plant Protection Center  
Oregon State University

Makhfousse Sarr  
FAO Senegal

Keywords: constructivism, learner-centered education, decision-making, outcome-based education, science-based

Introduction
Participatory adult education for smallholder farmers in the developing world, even though widespread, lacks an evidence base for effectiveness and durability (Waddington et al., 2014, Waddington & White, 2014). In 2015, we introduced an outcome-based education method that we have employed with farmers in Senegal to reduce pesticide risks. We describe here, how we have incorporated the theory and practices of cognitive constructivism within this program. We will demonstrate the central role that theory has played in the development of our process, by reviewing three steps: co-developed intended outcomes that enable identification of key knowledge gaps, the development of decision support tools, and the sourcing of relevant data to create realistic learning experiences (Halbleib and Jepson, 2015; Jepson et al., in prep. #2). By acknowledging and incorporating relevant theory, we have articulated a series of feedback loops that bring scientists, educators and farmers together in a fluid community of learning that has ramifications for the way in which each partner conducts their work.

Purpose and Objectives
Our work illustrates the degree to which educators must constantly view all aspects of the program through the lens of the learners’ approach to problem solving. We discuss three design steps within which educators adjust their perspective to clarify and refine what is needed for progress: 1) engaging in a vision-building process with stakeholders, including potential learners, 2) providing critical knowledge that cannot be acquired through the farmers’ own direct experience, and 3) reducing decision-making uncertainty through the use of tools that exploit local data.

Methods and Theoretical-Philosophical Themes
Outcome-based education is grounded in cognitive constructivism. This theory argues
that individuals have unique representations of knowledge, based upon their own experience. Learning involves active exploration, which can reveal deficiencies or inconsistencies in knowledge and provoke reconstruction of the individual’s mental schema (Kohler, 2014). Constructivism places the learner at the center of the education process, and we illustrate how this key requirement guides not only the education program itself, but also the conduct of science that generates new knowledge to serve the needs of learners (Röling & Wagemakers, 1998).

We make the case that linear models of program development, that progress sequentially through each stage, fail to consider the central tenets of constructivism, and explain that this can result in less realistic, and therefore less effective education.

Our program design included a pilot study in a Senegalese village, where initial consultations took place with community members. In our presentation in 2015, we outlined the results of this pilot study and showed that farmers continued to reduce pesticide risks 3.5 months after the education program (Jepson et al., in prep #1). The output of the community visioning session was a set of intended program outcomes that incorporated the needs of a broad group, and served as the foundation for a program level guide that described the knowledge and skills required to achieve the intended outcomes. Course outcome guides were then created from downscaling selected program outcomes for a given learning experience. This process allows educators to design back to the essential concepts learners must know early in the course to reconstruct their mental schema. The essential knowledge for this course included pesticide properties, pesticide toxicity and pathways of pesticide exposure.

A constructivist perspective can be employed when formally examining the problems learners face, and in determining the information that is required to reduce uncertainties in decision-making. Decision support tools (DSTs) depend on two inputs to contribute to effective education: 1) the necessary information must be available, and in a form that is useable by learners, and 2) there must be access to technical development capacity to create tools that can support learners. We will outline how we were able to generate visual decision-making tables, representing the pesticides sold in the local market. These incorporated multiple elements of risk associated with the attributes and behaviors of farmers and the exposure of wildlife (Jepson et al., in prep #2). The importance of decision support to accelerate behavior change has been understated in the past, because of high technical demands, and also a failure to distribute and master the skills required to develop tools.

A methodology rooted in constructivism enabled us to create authentic learning scenarios that integrated use of DSTs, based upon local data. Groups portrayed their own farms to provide the basis for realistic problem solving scenarios. They used locally-specific pesticide risk information to select alternate pesticides with lower risk, and adjusted their activities to mitigate or eliminate any remaining risks (Jepson et al., in prep #2).

Results and Conclusions

We argue that by adhering to constructivist principles, the education program design ensured that each learner had the foundational knowledge that they needed, time for practice with a DST, and opportunities for feedback and discussion on proposed behavior changes. This approach allowed farmers to select pesticides of known risk. It gave them the capacity to resolve the conflict between selection of an effective pesticide, and the goal of achieving low risk for their family. Data from follow-up surveys with the initial group of farmers documented altered behaviors after the program (Jepson et al., in prep #1). Based on experiences provided through education, the farmers were able to go through a process of reconstruction, where learning and the real world
are effectively brought back into alignment (Kohler, 2008).

**Educational Importance and Broader Implications For Extension**

In education that is informed by constructivism, the learners’ input is valued, and indeed necessary for the program to sustain continued impacts. In order for extension educators to respond effectively to clients’ needs we argue that they must: 1) align education programs with the contextual realities of their clients, 2) employ locally-relevant data to develop decision-support tools, and 3) support problem-based learning that reduces critical uncertainties in the learners’ planning and actions.

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Introduction

For centuries Haiti has stood alone as the economically poorest country in the western hemisphere and one of the poorest in the world (Arias, Leguia, & Sy, 2013). The destructive earthquake on January 12, 2010 was a major setback to the development of the nation, further damaging an already weakened infrastructure. In 2015, Haiti’s poverty rate had climbed up to 80%, which left the vast majority of Haitians struggling with food security (USAID, 2011). Because food security has been directly related to poverty, the Haitian government has prioritized re-launching agricultural production in the country (Arias et al., 2013). According to USAID (2011), agriculture employed approximately 60% of Haitians, however, Haiti has imported more than 55% of its food. Agricultural production in the country has been exceptionally low and the government has identified this sector as an area of focus for the future development of the nation. Although billions of dollars have been invested into agricultural initiatives in the country, less emphasis has been placed on building the capacity of farmers through systematic programs (Arias, Leguia, & Sy, 2013). Much of the emphasis has been placed on offering farmers credit, improving agricultural infrastructure or providing emergency assistance (Joseph, 2012). This research focuses on the capacity development needs of Haitian farmers. The study asserts that Haitian communities will grow when appropriate emphasis is placed on strengthening one of the most vital key players in the local Haitian food systems, Haitian farmers.

Purpose

The purpose of this study was to explore the training needs of farmers in the North Department of Haiti. The objectives of this study were to:

1. Identify the most pertinent issues faced by farmers; and
2. Identify farmer perceptions of training needs.

Methodology

This research collected qualitative data in the form of a needs assessment (Creswell, 2013). It focused on 28 farmers in the North Department of Haiti. Farmers were selected from four cities that were known to have the highest agricultural production: Milot, Limonade, Limbe,
and Grande-Riviere-du-Nord. A total of seven farmers were selected from each city. Snowball sampling was used to identify the farmers selected for interviews. A semi-structured interview guide with 11 questions was used to collect data. Farmers were asked about farm demographics, barriers, and training needs. The instrument was orally administered in Haitian Creole due to the high illiteracy rates among Haitian farmers. Each interview lasted between 15-25 minutes long.

All data collected was recorded on an audio recorder. It was then transcribed and translated into English and peer reviewed for translation accuracy. After accuracy of the translation was established a thematic analysis was used in order to identify themes within the interview data collected (Creswell, 2013). Open-ended coding was used to detect themes. Each farmer was assigned a code based on his or her city and when interviewed. The lead researcher then collected themes found from conducting a constant-comparative analysis of the qualitative data (Fram, 2013). The lead researcher triangulated the data to increase trustworthiness. Credibility was addressed through the use of triangulation and peer reviewing. Transferability was address by the thick descriptions that were provided in the data analysis section (Lincoln & Guba, 1985).

**Subjectivity Statement**

As a Haitian-American woman, the researcher had a distinct perspective that influenced the interpretations of statements and actions of the Haitian farmers.

**Results**

The data showed Haitian farmers collectively had ten pertinent issues that were barriers to their productivity. These barriers were: (a) water management, (b) crop pests, (c) weather, (d) economic needs, (e) lack of support, (f) lack of knowledge, (g) lack of seeds, (h) poor market conditions, (i) floods, and (j) lack of animal control. Of these ten barriers water management and crop pests were the only two faced by every farmer. Every farmer, however, stressed water management (including irrigation), significantly more than crop pests. Many stated it was the most pertinent issue faced by them on their farm. One farmer stated, “the biggest need that I have is water” (M2) and another stated, “the biggest issue is water. Everything else is just small stuff, like insects” (L3). Some farmers went as far as stating the lack of water was the cause of some or all of their barriers, “we have no water so we have insects come eat our crops” (M7). When asked about solutions to diminish barriers one farmer stated, “if God gave me water, I would be good” (M4).

Farmers identified five general topics as their training needs. These topics included irrigation, efficiency in farming, cultivation best practices, planting seasons, and access to capital. Of these five topics irrigation and planting seasons were addressed significantly more than other topics. When asked to elaborate on irrigation training needs, one farmer stated, “my biggest problem is water. Water needs to be here. Without water you have no farm” (LB7). Likewise, when asked to elaborate on their need to learn about planting seasons one farmer stated, “show me how to plant, in which season and in what month I will find most profit in the farm” (M3).

**Conclusions, Implications & Recommendations**

The results of this study lay a foundation for international organizations to deliver training for farmers in the North Department of Haiti. Data showed none of the farmers had received any form of agricultural training, yet all of the 28 farmers had been farming since
childhood. The training topics identified by the farmers, specifically irrigation and water management, identify the most pertinent issues faced by farmers. It is recommended to develop, deliver, and evaluate extension programs for these farmers focusing on the training topics identified, specifically irrigation and water management.

Second, there were several themes identified through the thematic analysis. Themes included distrust towards the government and international NGOs, high external locus of control and farmer aspirations. These themes provide a basis for a deeper understanding Haitian farmers and their perceptions of farming in Haiti. This data should be further studied to explore this group of people since they are a key piece of the solution to long-term food security in Haiti.

References
New Media Use of Aspiring Entrepreneurs from Kenya, South Africa, and Uganda

Brentney Maroney
Oklahoma State University
Stillwater, Oklahoma 74075-6032
Tel#: 405-744-5130

D. Dwayne Cartmell II, Ph.D
Oklahoma State University

Shelly P. Sitton, Ph.D.
Oklahoma State University

M. Craig Edwards, Ph.D.
Oklahoma State University

Keywords: entrepreneurship, exchange programs, new media

Introduction/Theoretical Framework/Review of the Literature

New media technologies have started a revolution among social networking sites. “These sites are the tip of redefinition of how the Internet works, with every site now incorporating the feature that allows users to publish opinions, connect, build community, or produce and share content” (Smith, 2009, p. 559).

The growth of Facebook, LinkedIn, Twitter, Instagram, YouTube, and Pinterest have shaped the new ways people and businesses communicate and share information across the world (Indrpati & Henari, 2012). “This is a huge socio-economic shift that is changing the way consumers and companies communicate and interact with each other” (Indrpati & Henari, 2012, p. 48).

Similar to how the adoption of computers and the Internet took off in the 1990s (Rogers, 2003), new media is continuing to grow at an extreme rate (Boyd & Ellison, 2007). Along with rapid adoption, the Internet and new media platforms have changed the ways individuals seek and receive information, outdating traditional marketing strategies (Indrpati & Henari, 2012).

The perceptions of entrepreneurs using new media tools in developing countries has not been heavily researched, and a very limited number of cross-national or cross-cultural studies have been conducted (Okazaki & Taylor, 2013). Okazaki and Taylor (2013) described the lack of international studies involving social media as a glaring hole. They concluded “cross-cultural studies are badly needed” (p. 68) to expand knowledge about new media advertising across international markets.

Purpose and Objectives

The study’s purpose was to describe the perceptions of Entrepreneur Fellows (or simply Fellows) from Kenya, South Africa, and Uganda regarding their experiences with the digital media training they received in the United States, especially in regard to use in their business enterprises. (A grant from the U.S. Department of State funded the training program.) The Fellows’ entrepreneurial enterprises mostly involved agriculture or allied sectors.

This study included four research objectives:
1. Describe selected personal and professional characteristics of the Fellows;
2. Identify digital media use of the Fellows before the U.S. training program;
3. Identify digital media use of the Fellows six months after the U.S. training program;
4. Determine the Fellows’ perceived barriers to adoption of new media tools after the U.S. training program.

Methods and/or Data Sources

A mixed-methods approach was used to collect qualitative and quantitative data. A questionnaire and interview-themed analysis was employed to examine the Fellows’ perceptions during and after their U.S. training program. The aim of interview-themed analysis was “to provide knowledge and understanding of the phenomenon under study” (Downe-Wamboldt, 1992, p. 314).

The study’s population included 12 Fellows who participated in a five-week exchange program during May and June of 2014. The participants were selected based on an application and interview process.

To gain understanding of the Fellows’ opinions and knowledge of digital media before the training program, they were asked to complete a pre-arrival questionnaire. This part of the data collection process described the Fellows’ uses and perceptions of digital media.

Follow-up data collection, i.e., Skype interviews, were conducted six months after the Fellows returned home to further analyze how they made meaning of the training program. This data collection reflected the Fellows’ perceptions of digital media, and explored the techniques implemented in their entrepreneurial enterprises.

Results, Products, and/or Conclusions

The typical Fellow was 30 to 39 years old and male. Because of the program’s requirements, participants were equally distributed across the countries of Kenya, South Africa, and Uganda.

Before visiting the United States, all 12 Fellows used new media platforms and preferred using Facebook and Pinterest the most when compared to Twitter, LinkedIn, Flickr, Instagram, YouTube, and Skype. They used Facebook always compared to the other new media tools. On a weekly average, the Fellows’ spent most frequently two to seven hours on new media platforms. The Fellows mostly used platforms to connect with family and friends. Flickr and Pinterest were two platforms the Fellows had never heard of before their U.S. training.

While in the United States, the Fellows learned how to use new media in promoting their enterprises. Many did not realize new media could be used for business as well as personal needs. The Fellows, however, were apprehensive about the amount of information that could be shared in their home countries with technology limitations.

After the training program, many Fellows used new media platforms to expand their client base, to advertise new business products, and to promote their personal brand. The Fellows’ reported experiencing a significant increase in business, and attributed their growth to the adoption of new media marketing. Of note, two Fellows reported they were unsure if they would be able to keep up with the rapid growth in new clientele.

The exchange program allowed the Fellows’ to learn about how to market using new media platforms. The experiences left the Fellows’ with a desire to try new platforms and continue with already established tools. It was noted that Internet speed, variety of platforms, and cost might be barriers to using these tools in Africa. The Fellows indicated using a mobile
telephone to access the Internet reduced their costs. Overall, the Fellows explored more new
media platforms after their training but had trouble maintaining the tools because the preferred
platforms in Africa are different.

**Educational Importance, Implications, & Recommendations**
Leaders of similar projects should determine participants’ preferred new media tools
before their training programs begin. Future programs should focus on the new media platforms
already established in participants’ home countries while also exposing them to new tools.

More research should be conducted to better understand challenges to the adoption of
digital marketing efforts by entrepreneurs in developing countries, including individuals working
in the agriculture sector. Additional inquiry is needed to explore the benefits, challenges, and
long-term effects of exchange programs. A follow-up study is suggested to examine the
exchange program’s lasting impacts, especially in regard to the Fellows’ entrepreneurial
networks and aspirations in Africa, perceptions of the United States, and views on global
connectedness.

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Non-Traditional Export Crops’ Impact on Rural Guatemalans’ Wellbeing: A Case Study of Extension Education at the Cooperative Level

Georgia Arrindell
Undergraduate Researcher

Gary Wingenbach
Professor
Department of Agricultural Leadership, Education and Communications
Texas A&M University
2116 TAMU
College Station, TX 77843
979-845-3000
wingenbach@tamu.edu

Keywords: Development, Extension, Cooperatives, Guatemala, Farmers

Introduction
Smallholder farmers in Guatemala normally have two choices with which to use their limited lands: cultivate food (e.g., staple grains such as corn and beans consumed in the home), or grow cash crops (e.g., coffee, cardamom, etc. sold for cash). “The adoption of growing cash crops for smallholder farmers involves many factors including access to credit, available arable land, labor, export prices, etc.” (Carletto, 2009, p. 3). In fact, “Guatemala…has surfaced as one of the leading producer[s] of NTXs (non-traditional exports) in the region since the early 1980s” (Carletto, 2009, p. 2). However, cash crops do not always help smallholder farmers attain a better life, which might be demonstrated through their family’s wellbeing. “Guatemala has the fourth highest rate of chronic malnutrition in the world and the highest in Latin America and the Caribbean” (USAID, 2014, para. 1).

According to the World Health Organization (2011), 30.4% of Guatemalans live below the minimum levels of dietary energy. About 55% of Guatemalan children under age five have stunted growth (WHO, 2011). About 47% of Guatemala lives in rural areas. Studies show that rural populations are often more undernourished than urbanites; rural people’s diets are mostly comprised of maize-based foods (Iannotti et al., 2012).

Economic conditions in rural Guatemala are leading causes of food insecurity and health problems. “Rural Guatemalans, regardless of ethnicity, are almost always poor…across a broad range of indicators” (Beckett & Pebley, 2002, p. 7). Studies show that nonindigenous population’s poverty has declined slightly, but indigenous poverty remains high (World Bank, 2009, p. xiii).

Extension education programs is essential to smallholder farmers’ wellbeing. “The prominent form of extension to smallholder farms is agricultural assistance in the form of technology transfer for the improvement of the livelihoods of farmers, their families and communities (Dragon, 2005, p. 7). In Guatemala, many organizations use extension education to improve smallholder farmers’ livelihoods. This study focused on two organizations: Rabinal Vargas Farmer’s Cooperative and the U.S. Peace Corps.
Methods

The purpose of this study was to determine the impact of non-traditional export cash crops (e.g., snow peas, sugar peas, etc.) on the perceived wellbeing (e.g., economic and/or family health status) of selected rural Guatemalan households. “[A] qualitative case study is an approach to research that facilitates exploration of a phenomenon within its context using a variety of data sources” (Baxter & Jack, 2008, p. 544).

We made site visits to a snow/snap pea growers’ association, “Rabinal Vargas,” in Zaculeu, Guatemala. We visited with three association member families, asking them about their work/financial situations, and family lives. We visited with three Peace Corps Volunteers (PCVs) working in schools and health centers in Patzun, Guatemala. Most farmers living near Zaculeu and Patzun grew NTXs.

Data were analyzed through the constant-comparative method. “Each data source is one piece of the ‘puzzle,’ with each piece contributing to the researcher’s understanding of the whole phenomenon” (Baxter & Jack, 2008, p. 554).

Results

Data revealed that rural Guatemalan families producing NTXs (e.g. snow peas, coffee, etc.) had better livelihoods and were more financially secure than were families without NTXs. Additional findings centered on thematic areas of production processes, income, labor, nutrition, and health. We asked farmers about agricultural inputs (i.e. seeds, fertilizer, pesticides, etc.). Rabinal Vargas provided farmers with all inputs through production loans. According to Emilio (pseudonym), production costs were about $90 (USD) per season for his plot (~1.5 acres). He harvested one ton of peas/season, which sold for $40/cwt; gross revenue/season was $800. The snow pea season earned Emilio about $100/month.

According to the CIA World Factbook (2015), “Guatemalans have a history of emigrating legally and illegally to Mexico, the United States, and Canada because of a lack of economic opportunity, political instability, and natural disasters.” Julieta said her husband went to the U.S., sent money monthly, which helped buy food and send their children to school.

Hiring labor is too expensive for most farmers; some have children and extended families help with vegetable production processes. According to Emilio, the average Rabinal Vargas’ family has eight members. Many times, children miss school to work the fields. According to M. Hernandez (PCV) most children do not attend secondary school because they work in the fields, or because school is too expensive.

Nutrition for most families with NXTs appeared to be better than for subsistence farmers. Most families grow corn and beans, and have NTXs; sometimes they eat their peas if there is extra harvest. If a family has enough money, they buy protein (e.g. eggs, chickens) and other vegetables. Although some families may be able to buy more food because of extra income, there is still much malnourishment in rural Guatemala.

Conclusions, Recommendations, and Application

Farmers who grew non-traditional export crops in Guatemala appeared to have improved livelihoods, more so than most subsistence farmers, because of extra income from their NTXs. Producer associations are usually more financially secure because members have more access to information and inputs. Nutritional problems continue to be a concern in rural Guatemala; more than one-half of the population is malnourished, of which most are rural populations. Health also include diarrhea and other diseases that are usually treatable at the rural health centers.
In general, cash crop families (especially those in associations) have better access to food because they can buy what they do not grow. Cash crop families’ incomes varies, but is usually enough to sustain families through the pea and other NXT growing seasons. When the pea season is finished, some families may disintegrate to earn additional income. Many find off-farm employment in Guatemalan cities or other countries.

Extension education in agriculture could improve NXT-growing families’ wellbeing. Rabinal Vargas works closely with others (U.S. Peace Corps) to teach farmers new methods to increase yields and profits. Simple methods can include creating compost or contour lines to prevent soil erosion. With these improvements, farmers can increase their profits, and improve their livelihoods. Smallholder farmers can buy foods for a healthier diet and better quality foods for improved health.

References


Outcomes and Lessons Learned from an Extension In-Service Training focused on Growing Communities through Local Food Systems: Implications for International Agricultural Development

Joanna Massey Lelekacs
North Carolina State University
Box 7609
Raleigh, NC 27695
Phone: 919-515-1195
Fax: 919-515-2505
joanna_lelekacs@ncsu.edu

J. Dara Bloom
North Carolina State University

K. S. U. Jayaratne
North Carolina State University

Carol Mitchell
NC Cooperative Extension, Wake County Center

Keywords: local foods, local food systems, community-based food systems, local food systems in-service training

Introduction and Conceptual Framework

A growing number of communities are seeking to address multiple social challenges through a focus on a unifying human need – food. By focusing specifically on local food, multi-discipline stakeholders seek to address health disparities, food insecurity, economic development, and improve the profitability of farmers (Onozaka et al, 2010). Interdisciplinary partnerships and expertise are a critical component to successful contemporary local food systems development (Green & Hilchey, 2002). Extension trainings must take into account this interdisciplinary, cross-program environment, as well as the expanding roles of Extension educators beyond traditional education, including, but not limited to the following: 1) facilitating community engagement, 2) facilitating value chains, 3) acting as institutional entrepreneurs, and 4) promoting community capacity building (Raison, 2010; Dunning et al, 2012; Strong, 2015).

Because of growing community interest in local food systems development in North Carolina, and the fact that local foods can be addressed by agents in all program areas, North Carolina Cooperative Extension has named local foods as a flagship program. Development of the local foods flagship program has included a needs assessment, in-service trainings, and the creation of a graduate level course that is currently being adapted into an online professional development course. This paper presentation shares the outcomes and lessons learned from the design, delivery, and evaluation of a Cooperative Extension local food systems in-service training. The implications of this study are helpful for Extension professionals developing in-service training programs that support multi-faceted local food systems development.
Purpose and Objectives

The purpose of this paper is to share lessons learned and the outcomes of Extension in-service training workshops supporting community economic development through local foods systems. This paper focuses on the following objectives:

1. Document the outcomes and lessons learned of local foods in-service training workshops and their implications for Extension local foods programs, and
2. Identify factors that may contribute to successful cross-program Extension educator in-service training for supporting local food systems development as a strategy for international agricultural development.

Methods

A needs assessment was conducted to determine in-service training needs of Extension educators on local food systems topics. Based on the top needs identified through this assessment, three local foods training workshops were designed, delivered, and evaluated for an annual statewide Extension conference. These three workshops, which focused on systems and community development aspects of local foods, were titled:

1. Local Food Systems Programming: Engaging all Extension Program Areas and Community Resources in a Systems Approach
2. Moving Forward Together: Secrets of Successful Community Partnerships
3. The Role of Extension in Enhancing Access to Local Food

Workshops were evaluated immediately following the training using retrospective pre- and post-test quasi-experimental design surveys. Knowledge change on several topics per workshop and level of aspiration to apply learned practices were evaluated using a five-point Likert scale. Outcomes of the workshop were evaluated six-months following the conference through an on-line survey.

Results

193 unique Extension educators participated in the three local foods training workshops. Participants represented all Extension program areas and included county and campus-based educators as well as administrators.

Response rates to pre- and post-test surveys ranged from 69 to 77% for the three workshops. All three workshops significantly improved participants’ knowledge on local food systems based programming. A majority of respondents (51.2% to 79.7%) expressed their intention to implement what they learned.

The 6-month post-conference follow-up survey evaluation received a 36% response rate. Respondents indicated that they had implemented local food programs utilizing information or methods learned through the workshops such as, but not limited to, developing community partnerships, conducting educational programs with community partners for enabling limited resource community access to local foods, and supporting or initiating local farm to school programming.

Conclusions/ Recommendations / Implications

Evaluation results included few differences among program areas in knowledge change and potential practice changes. These results support a conclusion that the local foods workshops were effective at creating cross-program local foods training by addressing issues that are equally relevant to educators in all program areas. Therefore, we conclude there is value in
bringing together Extension educators from different disciplines into local foods trainings on
generalized topics, including those focused on social dimensions of local foods.

Evaluation findings indicate a tension between Extension educator requests for specific
tools and resources and the need to provide generalized, systems-focused, cross-discipline
training, particularly for educators just beginning work in this area. Formative evaluation
information also suggests that participants coming into a local foods workshop may be seeking
successful application-focused examples – success stories. To address both of these issues, it is
important to begin local foods in-service training with a general, cross-program, system-focused
session, and then follow up with discipline specific tracks that provide detailed tools and
resources on specific topic areas. The discipline specific tracks also create space for participants
with prior knowledge to serve as resource persons, sharing their local success stories. This
approach provides local Extension educators with important background information, while also
letting them self-select into more focused training sessions where they can hear success stories
and receive specific tools.

This paper presents outcomes, challenges, and lessons learned from cross-program local
foods training for Extension educators. As local food systems development work continues to
expand, it presents new challenges for grassroots-level Extension educators due to the
interdisciplinary nature of the field. It will require further evaluation, particularly in the tension
areas noted in this paper, as more Extension programs begin or continue to incorporate a focus
on local foods into their programming.

Promoting local foods as a flagship Extension program brings all Extension partners and
communities together, closing the widening gap between the farmer and the consumer in a
continuously urbanizing world seeking to achieve food security, economic prosperity, and
healthy living. Therefore, local food system programming has implications for agricultural
development in any part of the world.

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A Panel Study on Adoption of Commercial Vegetable Farming in Western Nepal

Bineeta Gurung
Michigan State University
Department of Community Sustainability
148C Natural Resources Building
480 Wilson Rd.
East Lansing, MI 48824
Tel: 517-755-8527
Fax: 517-432-3597
gurungbi@msu.edu

Ramjee Ghimire
Michael Kaplowitz
Murari Suvedi
Michigan State University

Keywords: vegetable, adoption, income, farmers’ perceptions, Nepal

Introduction
Subsistence farming predominates Nepalese agriculture. More than 78% of farm households (HHs) produce mainly for self-consumption. About 21% of the HHs use their produce almost equally for both sale and home consumption, and less than one percent are known to produce mainly for sale (World Bank, 2006). Despite subsistence farming, more than 50% of all households in Nepal are not food-sufficient for even half the year (FAO, 2012). Transitioning from subsistence family-based farming to commercial farming is crucial to increase productivity and alleviate rural poverty among smallholder farmers in Nepal.

To stimulate commercialization, vegetable farming has been promoted since vegetable crops are reported to yield higher income per unit of land compared to cereals and other crops (Pokhrel, 2010). Off-season vegetables in particular have been emphasized in the mid-hills of Nepal as high value crops (Manandhar, 2000). As a result, off-season production of tomatoes in plastic tunnels in Nepal’s hilly region has emerged as a profitable enterprise (Pandey & Chaudhary, 2004). Despite potential to increase household food security and income, farmers’ adoption of vegetable farming remains a challenge in Nepal. It is important to understand farmers’ incentive and the decision process that guides both their willingness and their capacity to implement improved technology for commercial vegetable farming.

Study Objectives
The broad objective of this paper is to study the adoption of vegetable farming in rural Nepal. This panel study first seeks to investigate the trend of vegetable farming in two years in three village development committees (VDCs) in the Kaski district of Nepal. Secondly, the study aims to evaluate farmers’ perceptions of the barriers to adoption of improved technology.
Methodology

The study was conducted in three VDCs - Hamsapur, Rupakot and Thumki - in the Kaski district of western Nepal where subsistence agriculture is the major source of livelihood and holding average is 0.45 ha (CBS, 2011).

Data were collected from 139 HHs during July and August in 2014 and 2015. Face-to-face interviews of farm household heads were conducted to get information on household and farm characteristics. Likert-type questions were asked to learn about farmers’ perceptions on barriers to adoption of technology. The same individuals were asked the same set of questions both years. Data were entered and analyzed using SPSS version 20.

Results and Findings

Household Characteristics

Seventy-four percent of the HHs surveyed were headed by males. Thirty-six percent of the HHs belonged to upper caste group, 45% to ethnic caste group and 19% to occupation-based caste group. The average age of HH heads was 50.7 years. Average family and farm size were 6.39 persons and 0.5 ha respectively. Men and women jointly made important farming decisions in 50% of HHs.

Vegetable Farming Trend in 2014 and 2015

Comparison of vegetable farming data, which included total area under production, production, sales and income in the two different years, revealed 12 commonly grown vegetables: tomato, cucumber, bottle gourd, sponge gourd, bitter gourd, beans, chili, okra, cabbage/cauliflower, broad leaf mustard, and potato. Some households reported growing vegetables such as pumpkin, snake gourd, onion, garlic, ginger, and eggplant.

Paired $t$-test revealed 37% increase ($p < 0.05$) in the average area under tomato farming in 2015, which resulted in fourfold increase ($p < 0.001$) in tomato production from 111.11 kg in 2014 to 483.81 kg in 2015. Income from tomato sales increased four times in 2015 ($p < 0.001$). Among other vegetables, there was decrease ($p < 0.05$) in total area under production. Despite decrease in area, vegetables produced and quantity sold increased in the second year. As a result, income from vegetable sales doubled ($p < 0.01$) in 2015.

This result indicates that vegetable production, especially tomato in plastic tunnels, is a good source of HH income. Increased productivity of tomatoes and other vegetables could be an indicator of adoption of improved technologies such as improved vegetable seeds and tomato production in plastic tunnels.

Farmers’ Perceptions on Barriers to Adoption of Improved Agricultural Technology

To measure farmers’ perceptions on barriers to adoption of improved technology, the respondents used a scale of 1 to 5 — with 1 being “not important at all”, 2 being “little important”, 3 being “neutral”, 4 being “somewhat important” and 5 being “very important” — to rate nine statements.

In 2015, the statement receiving the highest rating was lack of access to market ($M = 4.53$) and the lowest rating was for lack of own land to farm ($M = 1.7$). In 2014, the statements receiving the highest ratings were lack of sufficient knowledge on agricultural technology ($M = 4.99$) and lack of education and skills to adopt new technology ($M = 4.99$). The statement receiving the lowest rating in 2014 was the agricultural technology is not suitable for my farm ($M = 2.24$).

This result indicates that in the second year, farmers had improved their agricultural skills and knowledge and therefore no longer perceived them as a barrier. Improvement in their skills
and knowledge is evident from the increase in productivity in 2015. Lack of access to market was perceived as a major barrier in 2015 and this points toward two things: first, farmers were growing vegetables for both consumption and sale; second, improved access to market is likely to increase their incentive for sustainable adoption of improved technology.

Conclusions and Recommendations

Use of technologies such as improved vegetable seeds and tomato production in plastic tunnels can help to increase farm productivity as well as household income. Increasing farmers’ skills and knowledge in vegetable production is crucial for adoption of technology in the initial phase. Once they acquire knowledge and skills, farmers perceive access to market as a major barrier to technology adoption.

Further research needs to be directed towards exploring factors hindering farmers’ access to market and possible ways to increase their access.

References


A Photovoice Process Exploring Indonesian Journalists’ Perceptions of Biotechnology in United States Agriculture

Holli R. Leggette
Assistant Professor
Texas A&M University
262 AGLS, 2116 TAMU
College Station, TX 77843–2116
Phone: 979-458-3039
Fax: 979-845-6296
hollileggette@tamu.edu

Thomas Hall
Assistant Director for International Agriculture, Borlaug Institute
Texas A&M AgriLife

Theresa Pesl Murphrey
Associate Professor
Texas A&M University

Keywords: Perceptions, Biotechnology, Science Journalism, United States Agriculture, Photovoice

Introduction
The media’s impact on public perception about science and agriculture cannot be underestimated. Besley and Shanahan (2005) found a significant relationship between “communication variables and biotechnology support” (p. 347). Journalists’ understanding of science, such as biotechnology, is important. Navarro, Tome, and Gimutao (2013) stated media professionals perceive biotechnology as complex, struggling to disseminate the information in a “simple layman language” (p. 31). This lack of understanding leads to “shy[ing] away from reporting on the topic or worst, sensationaliz[ing] issues” (p. 31).

Journalists’ lack of “evidence-based factual information” (Moualhi, Galhena, Maredia, & Weebadde, 2014, p. 51) could negatively impact public perception of biotechnology. A potential solution and reason-based argument is to provide journalists with science journalism skills and science-based biotechnology information to disseminate to broad public audiences. Ransom and Maredia (2012) studied capacity building, through professional development, in the context of bioenergy and biofuels, and Toness (2001) studied capacity building using participatory rural appraisal. Our study documented perspectives of biotechnology to guide capacity building activities for journalists.

Purpose and Method
A modified version of Wang and Burris’ (1997) photovoice method was used to explore Indonesian journalists’ perceptions of biotechnology. Photovoice encourages “participatory action research” (Wang, Yi, Tao, & Carovano, 1998, p. 75) and “entrusts cameras to the hands of people to enable them to act as recorders, and potential catalysts for change” (Wang & Burris, 1997, p. 369).
Six Indonesian journalists participated as a result of a two-week field experience related to agricultural biotechnology. During the field experience, journalists collected photographs and discussed biotechnology and United States agriculture. At the end of the activity, the journalists discussed the experience with each other. Each participant was asked to submit up to 15 photographs capturing his or her meaning of the experience and submit a caption aimed at answering Wang’s (1999) SHOWeD questions with each photograph. A total of 103 photos with corresponding captions comprised the study’s data. Before analyzing the data, each photograph and its corresponding caption was coded using a random two-digit number assigned to the participants at the beginning of the training and a sequential number followed by a P for photograph and a C for caption (e.g., the sixth photograph in the series for participant one would be 01:06P).

A grounded theory approach (Glaser & Strauss, 1967), common in photovoice studies (López, Eng, Randall-David, & Robinson, 2005; Borron, 2013), guided by our research question “How do Indonesian journalists perceive biotechnology in U.S. agriculture?” was used in the analysis of the photographs and captions. We engaged in the open coding technique to begin the interpretation process, which yielded 19 themes. Using focused and axial coding during the second round of analysis, emergent themes were narrowed to three primary themes, and photographs were grouped accordingly. We then re-verified that the photographs aligned with the captions. During the third round, we individually reviewed the photographs and captions to confirm the themes. We established trustworthiness through credibility, dependability, transferability, and confirmability as described by Merriam (2009).

Findings

The analysis yielded three overarching themes all with sub-themes to accurately describe the components within the themes. The themes included GMO debate (general debate and labeling), process (whole process and process steps), and food security (variety and productivity).

GMO Debate

The journalists, collectively, recognized GMOs as an important agricultural issue that has created debate in the United States. One journalist noted GMOs have been on the market for more than 20 years, yet U.S. consumers continue to “misunderstand” the technology (01:08C). Another journalist sought to “feel” the true “difference [between] organic and biotechnology” (05:09C), recognizing Indonesia has “not applied biotechnology” but it has “started using hybrid” (05:12C). Two journalists captured the true difference between organic and biotechnology plants by photographing a soybean plant infested with soybean looper and the velvetbean caterpillar and a plant without infestation (02:05P; 05:13P). An ongoing part of the GMO debate is GMO labeling, which was a highly disputed topic at the time of the field experience. One journalist noted that “regardless the controversy, labeling the product [is a] must” (05:02C).

Process

Participants perceived biotechnology as a process both as a whole and in steps. Instrumental to learning about the process is “listening” to an expert “explanation” about the complexities of science (05:14C, P). Journalists noted one farm believes in “openness” (02:10C) of its “high-tech facilities” (01:10C) and “involving consumers” in “every process of farming” (02:10C). The biotechnology process includes a “lengthy and costly research [process] conducted to produce seeds that increase productivity while meeting the requirements … for
human, animal, and environmental safety (01:07C). One journalist noted the GMO process “increases productivity” in the field with “minimal consumption of water and pesticides” (01:02C). Biotechnology process steps indicated by journalists included field (01:12P), greenhouse (01:01P; 06:11P), plant breeding (01:06P), research (01:04P; 01:07P; 01:15P), and packaging and distribution (05:11C).

**Food Security**

Participants viewed biotechnology’s role in regard to food security as related to variety and productivity. Journalists indicated biotechnology allows for crop variety (05:03P, 05:07C) and pest resistant crops, which increases productivity (02:03C, 02:04C), thereby, increasing food availability (5:06P). It “help[s] farmers increase productivity and food security” (02:08C) and includes research on a cassava plant that is “resistant to deadly pests” (01:05C). It is the “management and technology” that helps United States farmers produce the highest quality food possible (02:09C).

**Conclusions, Implications, & Recommendations**

Indonesian journalists’ described biotechnology as a highly debated, multi-step process impacting food security. Journalists are gatekeepers. Understanding their voice can enable agriculturists to more effectively communicate about biotechnology and to develop impactful capacity building activities that enhance journalists’ understanding of science.

Providing gatekeepers with scientific, factual information could have far-reaching impact on debatable issues. Journalists have the potential to persuade government officials in policy development. Thus, educating journalists about the scientific side of biotechnology may impact its acceptance within a specific country. A follow-up study should be conducted with journalists who did not participate in the experience to see if differences exist in the two group’s perceptions.

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Partnering with Communities Utilizing a Mutualistic Process: Developing Positive International Education Opportunities for Students in Higher Education

Kristina G. Ricketts, Ph.D.
314 Garrigus Building
Community & Leadership Development
University of Kentucky
Lexington, KY 40546
k.ricketts@uky.edu
Ph: 859.257.3767
Fax: 859.257.1164

Tara A. McClintic
Graduate Assistant
Community & Leadership Development
University of Kentucky

Bryan J. Hains, Ph.D.
Community & Leadership Development
University of Kentucky

Keywords: International Education, Study Abroad, Community Impact, Student Development

Introduction

A continuous increase in globalization and growing diversity in society demands that students have a greater understanding of people and culture (Myers, Hill & Hardwood, 2005). International educational experiences aim to assist in filling that gap by developing student cultural competence. According to an Open Doors Report on International Education Exchange, in the 2012-2013 school year, a record high of 283,332 students studied abroad for academic credit. In addition, US participation in study abroad has more than tripled over the past two decades (Institute of International Education, 2013).

It is evident that international education opportunities are invaluable tools for student development – they deepen student learning and can be directly linked to growth in important career skills, such as intercultural competencies and global awareness (Kuh, 2009; Kurt, Olitsky & Geis, 2013). But beyond student benefits, international host communities also experience major impacts. A lack of research demonstrates that rarely is the coin flipped; seldom is the question posed “How do international experiences affect the host community?” Only recently have we begun looking at student education abroad experiences from a community perspective (McClintic, 2015). Positive effects from community reciprocity include building relationships, enhancing social capital, and developing mutual respect (Gammonley, Rotabi & Rotabi, 2007). Therefore, it stands to reason that for international educational opportunities to benefit both students and the community, host communities should be included in the planning and implementation of these programs.

Purpose & Objectives

The purpose of this exploratory study was to understand the roles of the host community
in the process of developing and implementing international education opportunities for students in higher education. The guiding research question for this qualitative study was:

RQ1: How do communities prepare to work with students and faculty in international education opportunities?

Methods

The research context for this study focused on the international education experience integrated into a community education and social justice course offered during May 2014. Research participants included students and faculty from one southern land grant university, faculty at a Canadian University, and leaders and members of the host community (which was home to the Canadian University). The researcher-designed instrument included questions developed to address facets of the guiding research question and was reviewed by an expert panel of faculty (Patton, 2014). Individual, semi-structured interviews were conducted, utilizing the instrument. After transcription, the researchers conducted a detailed contextual and thematic document analysis of the participant interviews and observable data. In an effort to ensure research trustworthiness and rigor, a variety of approaches were used – expert review panel, researcher triangulation, and data member checking (Golafshani, 2003).

Results

Overall, data indicated the host community involved was underprepared for engagement with students. A majority of the Canadian faculty and community members expressed that one of the most important aspects of a program like this it to have positive impact on the host community; yet within this experience, at the community level there was nothing to ensure or evaluate this impact.

Furthermore, many of the host community members and participating students felt disconnected during the experience; part of this was attributed to the physical distance between the program directors at each location (domestic and international) that often lead to a communications barrier. It was also noted that a lack of clarity as to student expectations made determining overall program success, in both an individual and community context, challenging.

Conversely, all of the research participants – students, faculty and host community members shared a common and vested interest in continuing to participate in future international education opportunities. Students recognized a profound shift into a more holistic perspective; for the community, it was the opportunity to reflect upon their own community’s perspectives and opportunities in a unique, purposeful way. Overall, each group cited positive impacts from the experience; still it was made clear that had the host community been more involved in the planning process, greater student impact could have been achieved within the community.

Conclusions & Implications

Overall, the process of developing and implementing international educational opportunities needs to continue to develop and grow as the student interest has in higher education. On the community level, it is apparent there is a lack of preparation and consideration of potential impacts within the international host community. It is especially important to recognize this is also a learning process for the international host communities, and to provide appropriate structures to help ensure success. Suggestions for future research include focusing on best practices for communities to host international educational experiences and replication of the current study in different international host communities and course contexts.
References
Introduction/Theoretical Framework/Review of Literature

Reflection is an essential element in short-term study abroad programs. To maximize student learning from experiences, such as international ones, reflection should be carried out (Kolb, 1984; Roberts, 2006). Students with little or no prior study abroad experience see short-term study abroad programs as a starting opportunity (Willis, 2014). In settings with novice learners, guided forms of reflection should be carried out (Roberts & Jones, 2009).

Photo reflections are one form of guided reflections appropriate for short-term study abroad programs. Photo reflections are a method used in study abroad program to guide students in recalling past experiences from the program (Gray, Downey, & Gothard, 2012). Photo reflection has proved to be an effective tool at helping students notice sooner and better understand what they have learned from their experiences abroad, while deepening global awareness (Downey & Gray, 2012).

Purpose and Objectives

This specific short-term study abroad program implemented guided photo reflections. To continuously improve the planning of short-term study abroad programs, it is important to discover which specific portions of the program students valued the most and to note which aspects seemed to have a strong impression on the students. The findings from this study will provide short-term study abroad program faculty directors useful knowledge on which aspects of the program positively impacted the students.

The specific objectives of this research study were to:
1. Examine which aspects students value most in a short-term study abroad program.
2. Understand which in-country experiences seem to have strong impressions on the students and in what manner.
Methods

[Southern State University] Crop Science 2015 Short-Term Study Abroad Program in Costa Rica was the focus of this qualitative research study. A census study was completed with the population of 2015 student participants of the Crop Science Short-Term Study Abroad Program in Costa Rica (N = 12). All twelve students were enrolled in a three hour course at [Southern State University] named “Feast or Famine in Costa Rica.”

In hopes to provide Crop Science students and specifically first year or minority agricultural students a hands-on study abroad experience related to their field of study, this short-term study abroad program was started in spring semester of 2015. This short-term study abroad program focused on food security issues in Costa Rica and strived to enhance the students’ experiences by providing participants with meaningful interactions with local members of agricultural communities, universities, and companies, while exploring different regions and micro-climates of Costa Rica.

After their time in Costa Rica, student participants were asked to respond to a photo reflection on the course Moodle page. This prompt served as a reflective tool to provide insight on the students’ experiences in Costa Rica, specifically related to six given themes. These six themes were chosen to attempt to gain a better understanding of the student participants’ in-country experiences not just on agricultural issues, but also in a social and environmental context. For each theme, students chose one of their own photographs from their time in Costa Rica and then wrote a detailed narrative of how that experience related to the specific theme. The six themes were:

1. Agricultural systems/crop science in Costa Rica
2. Social inequalities or social opportunities
3. Interactions with people of other cultures, or Costa Ricans specifically
4. Friend or foe to the environment
5. Any changed feelings/opinions you have formed because of your experience abroad
6. Create your own “theme”

Content analysis was used to analyze the data from the students’ photo reflections, both their images and narratives. Within each of the six themes, the photos for that specific theme at hand were examined and their narratives were read. Photos and narratives were looked at together so that the narrative could explain the photo chosen by the student as a measure to prevent any assumptions from the researcher of why the student chose that picture to reflect on experiences under that specific theme. Inside each of the six given themes, themes and subthemes were found within the students’ responses.

Results and Conclusions

Within the student participants’ photo reflections, different students mentioned many of the same experiences. However, between students there was variation in which of the six themes that experience were discussed under, which meant some of the same experiences were wrote about in different angles: in an agricultural, social, or an environmental light.

Themes that arose when looking at aspects of the program the students most valued were: experiences at Costa Rican universities, learning from local farmers, biodiversity, language, community lifestyles, and food in Costa Rica.

When examining the students’ responses to determine if any strong impressions were made on the students, the following themes arose: discussions on climate change, food, and local people.
Recommendations/Implications

It is recommended that short-term study abroad programs offer extensive interaction with locals while in the country. Interactions with locals should be in different contexts: social interactions, content-based educational interactions, and interactions with similar age groups. Faculty directors should plan programs which provide opportunities for student participants’ to hear about beliefs on current issues in that country and culture, like creating an opportunity for students to discuss with a Costa Rican scientist about climate change and its evidence. Allowing students to hear controversial topics discussed from a person of the country can challenge students to grow. Faculty directors should integrate interactions between student participants and university students in similar fields in their short-term study abroad programs. Programs with a crop science focus should give students the opportunity to discuss with local farmers in-county. Farms of different types and sizes should be visited.

With an intensive amount of dealings with locals, the language difference should be embraced throughout the program. Mini-language lessons should be built into the structure of the short-term study abroad program. If all student participants are not fluent in the host country’s language, then translators should be abundant throughout the time abroad. If any of the participants are fluent, they should serve as leaders and be given the chance to translate some throughout the program.

References


Public Opinions of Food Insecurity Issues in Taiwan: Hints and Opportunities for International Extension Educators

Pei-wen Huang
University of Florida
Rolfs Hall, P.O. Box 110540
Gainesville, FL 32611-0540
352-870-8620
agnespei@ufl.edu

Alexa J. Lamm
University of Florida

Keywords: food security, public opinion, awareness, experience, extension education

Introduction
Food insecurity is a hidden threat not only in Taiwan but in most developed countries (Food and Agriculture Organization, 2011; Peng, 2011). As an island country, Taiwan has held one of the highest population densities in the world with more than 23 million people living in approximately 14,400 square miles (Ministry of the Interior, 2014). Due to the geographical limitations of the entire land area and agricultural cultivation land area on the island, feeding the increasing population has been a challenge (Peng, 2011). In addition to limited natural resources and a high population, the small farm operation systems, impacts of the openness of global trade for agricultural products, and conflicts between government policy and the agricultural industry have also been factors impacting the local agricultural industry in Taiwan (Kuo, 2013; Luo & Huang, 2003; Tsai, 2011). Currently, the food self-sufficiency rate has dropped to 33% in Taiwan in 2012, revealing the fact that almost 70% of the food in Taiwan is from imports (Council of Agriculture, Executive Yuan, 2014). This may lead to severe national security issues if the imported food sources were shut down (Peng, 2011). While extension has played a vital role in maintaining and improving food security in many countries (Cidro & Radhakrishna, 2006; Ramdwar, Stoute, & Ganpat, 2015), it has had little impact in Taiwan. Therefore, detailed information about current Taiwanese public opinions of food insecurity issues can facilitate extension educators’ programming to incorporate the general public’s effort in alleviating food insecurity in Taiwan.

Purpose and Objectives
The purpose of this study was to explore public perceptions related to food insecurity issues in Taiwan in order to inform extension educators about areas in need of support. The objectives were to identify respondents’ (a) perceived knowledge of food insecurity issues in Taiwan; (b) awareness of food insecurity issues in Taiwan; and (c) experiences with food insecurity issues in Taiwan.

Methods and Data Sources
An online survey was conducted to assess public opinions of food insecurity issues in Taiwan using a researcher-developed instrument. Residents living in the northern region of Taiwan were chosen as the population of interest to ensure the accessibility of the respondents.
via the Internet based on an almost 90% Internet coverage rate in 2014 reported by the National Development Council (2014). The survey instrument was developed in English and reviewed by a panel of experts and then translated into Taiwanese Traditional Chinese for another expert panel’s review. A pilot test was conducted to ensure the validity and reliability of the instrument.

Respondents were asked to indicate their perceived level of knowledge about food insecurity in Taiwan using seven items on a five-point Likert–type scale. The measurement of perceived knowledge was found reliable with Cronbach’s α of .95. Respondents were then asked 10 questions (eight true or false questions and two multiple choice questions) with one true correct answer per question related to food insecurity issues in Taiwan to measure their awareness of food insecurity. Respondents’ awareness scores were calculated by summing the number of correctly answered questions. Finally, respondents were asked about their experiences with food insecurity issues by selecting all that apply to six statements and an Other option. A non-probability opt-in sample was obtained with 991 entering the survey resulting in a 42% participation rate (N = 419). Data was analyzed using SPSS and descriptive statistics were used and reported.

Results

More than half of the respondents indicated they were not at all knowledgeable or slightly knowledgeable about (a) the proportion of local fresh produce imported in Taiwan, (b) the amount of food needed to feed the people in Taiwan, and (c) Taiwan's level of reliance on imported animal feeds. The respondents, on average, provided 6.8 correct answers out of the 10 food insecurity fact questions. The question that most respondents answered correctly was “The farming land area in Taiwan has decreased due to urbanization” (n = 386, 92%), followed by “An increase in flour consumption, such as breads and noodles, will enhance the reliance on imported food ingredients” (n = 384, 92%). The food insecurity issue that most respondents have experienced was “Food safety issues” (n = 365, 87%), followed by “Increased price of locally grown food” (n = 279, 67%).

Conclusions, Implications, and Recommendations

The findings indicated respondents had low knowledge levels of food insecurity issues related to agricultural production, which support Peng’s (2011) statement. This implies the need to communicate about the importance of local agriculture to the general public in the northern region of Taiwan. Although respondents showed a fair level of awareness of food insecurity, the findings also revealed a lack of understanding of the agriculture industry. As almost all the respondents had experienced at least one of the food insecurity issues in the past year, such a finding implies the need for problem-solving strategies. While this study filled the need for documented data about public knowledge and awareness of food insecurity issues in Taiwan, extension educators in Taiwan should educate to reduce the shortage of agricultural knowledge in the general public. Extension education programs related to the overall agricultural industry in Taiwan should be developed for the general public with inclusion of information related to food insecurity issues. The food security educational programs can focus on the connections between the general public, food, agriculture, and the food insecurity issues focusing on the most highly reported experiences. Doing this may assist the general public in understanding their roles of supporting local agriculture and alleviating food insecurity issues by reduced consumption of imported food. Future studies are recommended to examine the general public’s willingness to support local agriculture and factors influencing their willingness to support local agriculture to provide more robust recommendations to alleviate food insecurity issues in Taiwan by the
References


Rainwater Harvesting: Analysis of Sources of Information to Smallholder Farmers

Michael G. Kanyi  
Chuka University College,  
Department of Education,  
Box 109  
Chuka Kenya  
Email: michael.kanyi@ttu.edu

Dr. David E. Lawver, Professor  
Email: david.lawver@ttu.edu  
Texas Tech University,  
Department of Agricultural Education and Communications  
Box 42131 Lubbock TX 79409-2131,  
Tel. 806 742 2816

Keywords: Extension, information, rainwater harvesting, sources, universities.

Introduction
Rainwater harvesting from roof catchment can substantially reduce scarcity of clean potable water in developing countries (Oduor & Malesu, 2006). International development agencies have in the recent past engaged in concerted efforts towards prioritization of safe and clean water among rural households in developing countries (Adar & Check, 2011). In a study on community participation in integrated water, sanitation and hygiene, Silali and Njambi (2014) noted that “two and half billion people, mostly from developing countries, lack improved basic sanitation and hygiene facilities, and over 780 million people still use unsafe drinking water” (p. 11).

To address the challenges of inadequate clean potable water, various sources of information should have well-structured channels of information that are suitable and acceptable among smallholder farmers (Oduor & Malesu, 2006). Fragmented information dissemination can be associated with the low prioritization and adoption of rainwater harvesting among smallholder farmers (Baguma et al., 2013). In this study, the researchers sought to identify and describe sources of information on rainwater harvesting that smallholder farmers in Kenya rely on for information on rainwater harvesting.

Purpose and Objectives
The purpose of this study was to investigate the various sources of information on rainwater harvesting in Kenya and how smallholder farmers perceived their contribution as sources of information. Specific objectives were to:
1. establish and describe different sources of information on rainwater harvesting among smallholder farmers in Kenya;
2. compare the ratings of different sources of information on rainwater harvesting by smallholder farmers; and,
3. establish perceptions of smallholder farmers on the role of universities’ and government extension services on rainwater harvesting.
Methodology

This ex-post facto research was conducted in Kenya and involved a random sample of 310 smallholder farmers. Agencies that act as sources of information on rainwater harvesting among smallholder farmers were studied. A smallholder farmers’ questionnaire was used in data collection. A short questionnaire for extension agents was also used to validate information from smallholder farmers. A focus group discussion with key informants and four government extension agents helped to identify and compile a list of the sources of information to farmers in the study area. A list comprising 11 sources of information on rainwater harvesting to farmers was compiled and included in the questionnaire. Smallholder farmers rated the 11 agencies and institutions on their reliability and importance as sources of information on rainwater harvesting. A five point Likert-type scale was used in rating and a summated score was computed.

Results

Radio and television were ranked as the most relied on sources of information on rainwater harvesting ($M = 3.58$, $SD = 1.62$). University specialists were ranked quite low among the list of sources of information ($M = 1.36$, $SD = 0.83$). Table 1 displays a rank order of the various sources of information as rated by smallholder farmers.

<table>
<thead>
<tr>
<th>Source of information</th>
<th>Rank</th>
<th>$M$</th>
<th>$SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio and TV</td>
<td>1</td>
<td>3.58</td>
<td>1.62</td>
</tr>
<tr>
<td>Women group leaders</td>
<td>2</td>
<td>2.91</td>
<td>1.74</td>
</tr>
<tr>
<td>Newspapers</td>
<td>3</td>
<td>2.76</td>
<td>1.69</td>
</tr>
<tr>
<td>Local NGOs</td>
<td>4</td>
<td>2.38</td>
<td>1.66</td>
</tr>
<tr>
<td>Youth group leaders</td>
<td>5</td>
<td>2.23</td>
<td>1.52</td>
</tr>
<tr>
<td><strong>Government extension agents</strong></td>
<td>6</td>
<td><strong>2.13</strong></td>
<td>1.61</td>
</tr>
<tr>
<td>Church leaders</td>
<td>7</td>
<td>2.04</td>
<td>1.51</td>
</tr>
<tr>
<td>International volunteers/donors</td>
<td>8</td>
<td>1.96</td>
<td>1.49</td>
</tr>
<tr>
<td>Neighbors</td>
<td>9</td>
<td>1.81</td>
<td>1.24</td>
</tr>
<tr>
<td>Politicians</td>
<td>10</td>
<td>1.47</td>
<td>0.77</td>
</tr>
<tr>
<td><strong>University specialists</strong></td>
<td>11</td>
<td><strong>1.36</strong></td>
<td><strong>0.83</strong></td>
</tr>
<tr>
<td>Others</td>
<td>12</td>
<td>1.33</td>
<td>0.79</td>
</tr>
</tbody>
</table>

Note. $N = 310$

Conclusions

- Various sources of information on rainwater harvesting among small holder farmers were identified and listed in order of significance as seen in Table 1.
- Smallholder farmers consider radio and television as the most reliable sources of information on rainwater harvesting, ($M = 3.58$, $SD = 1.62$).
- Women group leaders were also rated highly as source of information on rainwater harvesting, ($M = 2.91$, $SD = 1.74$). Only the top three sources of information, the radio and television, women’s group leaders, and newspapers managed at least 2.5 rating score in a five point Likert-type scale.
- Government’ and universities’ extension service were rated low in comparison with other sources of information on rainwater harvesting.
**Recommendations**

- Support to women groups be enhanced by both county and national governments.
- It was recommended that various agencies and institutions that provide extension service to smallholder farmers endeavor to forge a stronger collaborative extension service on rainwater harvesting.
- Development of Reusable Learning Objects (RLO) for enhancing teaching and outreach programs for roof catchment. RLO are content specific materials that are prepared to provide condensed information that is re-usable overtime (Beck, 2009).
- Content analysis on the agricultural messages aired on radio and television for further improvement.

**References**


Rebuilding Higher Education Institutions in Conflict Affected Countries: Challenges, Alternatives, and Lessons Learned

K. S. U. Jayaratne, Ph. D.
Associate Professor and the Leader for Extension Program Evaluation
Department of Agricultural and Extension Education
North Carolina State University
Raleigh, NC 27695-7607
Phone 919-515-6079
Jay_jayaratne@ncsu.edu

Keywords: rebuilding agriculture colleges, conflict affected countries, development challenges

Introduction
In conflict-affected countries, schools and universities are many times occupied by armed groups and militaries causing damage to the educational infrastructure (GCPEA, 2015). The longer the conflict lasts, the greater the damage that is caused to those institutions. Once a prolonged civil conflict has ended, rebuilding agricultural universities is imperative to prepare the needed work force for the agricultural development of the country. In deed, investing in rebuilding the domestic capacity is important for preparing the work force needed in rebuilding conflict-affected countries (UWN, 2015). As well, continuous reform in higher education is needed to ensure the relevance of education to development challenges (Acker, 1999). For example, the Liberian higher education system had been destroyed by the time the Liberian civil war ended in 2003. Following the establishment of a democratic government, Liberia started to redevelop its ruined universities with assistance from the United States Agency for International Development (USAID). USAID used this window of opportunity for Liberian reconstruction (Bruce, 2004) including the rebuilding of the College of Agriculture at Cuttington University. This paper focuses on the experience of rebuilding the College of Agriculture at Cuttington University.

Purpose and Objectives
The purpose of the paper presentation is to share the experience and lessons learned when rebuilding the College of Agriculture at Cuttington University. More specifically it will answer the following questions:
1. What are the challenges in rebuilding universities in conflict-affected countries?
2. What strategies are effective in rebuilding universities in conflict-affected countries?

Methods
This paper presentation is based on the project experience and observations of the author while rebuilding the College of Agriculture.

Findings and Discussion
The College of Agriculture at Cuttington University rebuilding project funded by the USAID Excellence in Higher Education for Liberian Development (EHELD) occurred during
241

2011-2016 period. Cuttington University lacked adequate resources to prepare the needed workforce for post-war agricultural development work.

**Challenges and Opportunities**

The first and greatest challenge was the lack of qualified Liberians to teach at the College of Agriculture. This can be attributed to out migration of qualified Liberian educators during the prolonged conflict. The second challenge was the lack of curricula necessary for providing high quality degree programs. The third challenge was the lack of physical infrastructure such as class rooms, laboratories, farms, and a library for facilitating learning. The ending of the Liberian conflict and the receipt of reconstruction aids created a great opportunity to transform organizations (Clarke, 2010) to meet development needs. The greatest opportunity was the ability to modernize the College of Agriculture so it could meet development needs. Another opportunity was students’ commitment to learning even though the facilities were extremely limited. The university’s old physical infrastructure and land can be considered as additional opportunities.

Based on these opportunities a project was planned to rebuild the College of Agriculture by implementing two major strategies: 1) addressing the immediate needs to provide academic programs in the college, and 2) providing long-term solutions to improve the overall quality of education in the college.

**Addressing the Immediate Needs to Provide Academic Programs**

The college needed qualified faculty to teach agriculture courses. There were not enough qualified people within Liberia to recruit. Therefore, the project recruited and hired qualified faculty from selected foreign countries on a temporary basis. However, this hiring created a tension between the local and the foreign faculty due to salary differences.

Facilities such as classrooms were renovated and pertinent laboratories were built to provide practical experience necessary in agricultural education. As there was no current library facility, one was rebuilt and provided with the necessary books, computers, and Internet access. The faculty members committed for EHELD in partnering US universities visited Liberia and provided in-service training workshops for the faculty and students to improve the curriculum.

**Providing Long-Term Solutions**

It is a challenge for academics to make necessary adjustments for meeting development trends (Acker & Grieshop, 2004). However, the faculty members in partnering US universities collaborated with the Liberian faculty and administrators at Cuttington University to determine needed curriculum revisions and developed a detailed course catalogue. The necessary curriculum contents for the courses that were placed in the catalogue were developed by the partnering US faculty members and tested with the help of the temporary faculty at Cuttington University. Necessary revisions were made to tailor courses for the local needs. Additionally, Liberian faculty members and the administrators of Cuttington University were provided a training workshop at each of two US universities to prepare them for teaching the new curricula. A selected group of recent Liberian graduates were provided post-graduate education at selected universities in Africa and in the US as a permanent solution for filling current faculty vacancies. Some of these Liberian students have completed their graduate studies and have returned to fill faculty positions at Cuttington University. Others are close to completing their graduate programs.
Conclusions, Recommendations, and Implications

Rebuilding agricultural universities is important for preparing the work force necessary for rebuilding the agricultural sector in conflict-affected countries. It is a challenging task due to the lack of qualified individuals in the country for teaching; lack of curricula, and academic programs; and lack of physical infrastructure such as classrooms, laboratories, and other teaching facilities. However, rebuilding these universities can be accomplished by strategically phasing out the challenges. Rebuilding universities can be accomplished by:

- Recruiting and hiring qualified individuals from outside the country as temporary faculty for a practical, short-term solution to teaching courses.
- Providing in-service training for faculty development.
- Working with local faculty and administrators to review and make necessary curriculum revisions to meet development expectations.
- Implementing a plan to replace hired temporary faculty with trained local faculty as a long-term solution to faculty shortage. This can be achieved by selecting and training qualified individuals at foreign universities.
- Developing physical infrastructure such as libraries, laboratories, classrooms, and teaching farms.

The major implication of this paper is that it discusses the common major challenges and strategies necessary for rebuilding agricultural universities in conflicted-affected countries.

References


Should Extension Provide Programming for Selecting Marketing Options for African Indigenous Vegetables?

Juma Magogo
Graduate Assistant
Texas Tech University
Department of Agricultural Education & Communications
Box 42131
Lubbock, TX 79409
806-500-4375
juma.magogo@ttu.edu

David Lawver
Professor
Texas Tech University
Department of Agricultural Education & Communications

Patience Mshenga
Associate Professor
Department of Agricultural Economics & Agribusiness,
Egerton University, Kenya

Saidi Mwanarusi
Lecturer
Department of Crops, Horticulture & Soils,
Egerton University, Kenya

Nkurumwa, Agnes
Lecturer
Department of Agricultural Education & Extension,
Egerton University, Kenya

Keywords: Agro-pastoralism, livelihood, marketing margin, marketing outlet, African Indigenous Vegetables (AIVs).

Introduction

The role African Indigenous Vegetables (AIVs) can play in livelihoods of agro-pastoral communities should not be ignored. Development of more intensified production and marketing chains of AIVs would stand to play a significant role in both subsistence production and income generation among marginalized communities (Makhoha & Obwara, 2002). Renewed interest in AIVs among urban and rural consumers has seen growing market opportunities for these species. Despite the importance of vegetable marketing, evidence shows that it is given little credence in developing countries as well as facing constraints related to access to production resources and markets (Minot, 1986). In most of less developed rural areas, smallholder farmers are inhibited to participate in commercial markets. These difficulties have led to markets inefficiency, resulting in commercialization bottlenecks. The problem has been coupled by
paradigm shift from subsistence to commercial agriculture which calls for a market-led extension approach through adequate supply of market information by extension agents.

**Theoretical Framework**

This study used rational choice theory, which is a framework often used for understanding and modelling social and economic behavior (Bicchieri, 2003). In this theoretical framework, aggregate social behavior results from behavior of individual actors, each of whom is making individual decisions. The theory therefore focuses on determinants of individual choices (Chintagunta & Hanore, 1996) and assumes that an individual has preferences (Greene, 2002) among the available choice alternatives that allow them to state which option they prefer. These preferences are assumed to be complete and transitive.

**Review of Literature**

Marketing margin is most commonly used to refer to the difference between producer and consumer prices of an equivalent quantity and quality of a commodity. However, it may also describe price differences between other points in the marketing chain (Scarborough & Kydd, 1992). Marketing margins largely depend upon a combination of quality and quantity of marketing services, and the efficiency with which they are undertaken and priced. Therefore, in using market margin analysis to assess economic performance of markets, it is always preferable to deconstruct them into their cost and return elements (Scarborough & Kydd, 1992). Mendoza, (1995) warns that precise marketing costs are frequently difficult to determine in many agricultural marketing chains because these costs are often both in terms of cash costs and assigned costs. According to Mendoza, (1995), marketing margins should be understood as gross marketing margins and advises marketing researchers to emphasize gross marketing margins in reporting their findings due to difficulties associated in determining precise marketing costs. Thus, gross marketing margin (GMMp) was considered instead of net marketing margin.

\[
GMMp = \frac{\text{Consumer's Price} - \text{Marketing Gross Margins}}{\text{Consumer's Price}} \times 100
\]

After GMMp was calculated, a 2-factor ANOVA was utilized to determine significance difference.

**Purpose and Objectives**

The purpose of the study is to contribute to improved livelihoods among agro-pastoral communities through efficient marketing of AIVs with an objective of determining marketing margins of key marketing outlets of commonly grown AIVs.

**Methods and Data Sources**

Data for this study were collected from agro-pastoral Maasai in Kajiado and Narok counties, Kenya, using structured questionnaires which were administered to 200 purposively sampled respondents. Extension service providers who were recruited and trained as enumerators played a vital role in reaching out to the sampled respondents. The main respondent provided most of the information, but was allowed to consult other household members where necessary. SPSS version 17 was used for data entry and analysis. Market margin analysis was used to analyze the data. This research was restricted to analysis and documentation of performance of
markets for commonly grown AIVs by agro-pastoralists and included selected marketing outlets despite the fact that there were several other marketing outlets.

**Results**

The marketing margins of key marketing outlets were significant (P=0.10) indicating that variations of marketing margins varied across marketing outlets (Table 1). Local open air market emerged as the most profitable marketing outlet in the study sites, followed by brokers with least profitability recorded for farm gate.

Table 1
ANOVA of Marketing Margins

<table>
<thead>
<tr>
<th>Marketing outlet</th>
<th>Night shade</th>
<th>Vegetable amaranth</th>
<th>Cowpeas</th>
<th>Spider plant</th>
<th>Mean Market Outlet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm gate</td>
<td>2.330</td>
<td>2.250</td>
<td>2.440</td>
<td>2.177</td>
<td>2.300</td>
</tr>
<tr>
<td>Local open air market</td>
<td>5.740</td>
<td>3.010</td>
<td>4.950</td>
<td>3.950</td>
<td>4.412</td>
</tr>
<tr>
<td>Brokers</td>
<td>3.650</td>
<td>2.226</td>
<td>3.720</td>
<td>2.999</td>
<td>3.147</td>
</tr>
<tr>
<td>Mean Vegetable type</td>
<td>3.907</td>
<td>2.500</td>
<td>3.703</td>
<td>3.039</td>
<td></td>
</tr>
<tr>
<td>F – value</td>
<td>3.234</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P- value</td>
<td>1.103</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Vegetable type*Marketing outlet, P<0.0001

This implies that marketing margins were only significant at marketing outlets vis-à-vis vegetable type. These findings are in agreement with those of Mohammed & Orthmann, (2005) who found that selling vegetables at local markets has a high marketing margin due to good selling price, low transport cost and using family labor in marketing of vegetables in Northern part of Bangladesh. Hazoor, Muhammad & Zakir (2010) contended that local markets had a high marketing margin for citrus in a study of the Sargodha region of Pakistan.

**Discussion and Conclusion**

Local open air market is the most profitable marketing outlet for commonly grown AIVs. Capacity building of farmers towards equipping them with crucial information about markets is of paramount necessity. Extension systems should not only focus on agricultural production but should also lay emphasis on marketing for holistic development of farmers. Market-led extension builds emphasis on the focus shift from ‘content’ to ‘function’ stressing the need of agriculture extension to be more than just a delivery vehicle for agriculture technology, but also get involved in all stages of farmer’s decision making to guide them in making the right decision at the right time.

**Recommendations**

The authors of this study recommend promotion of marketing outlets with high marketing margin as well as increasing quantity of AIVs sold at the most profitable marketing outlets. In addition, there is need to enhance value addition activities to improve quality of AIVs in order to capture higher prices. Finally, the County government of Narok and Kajiado need to consider
support policies and regulation that are necessary to stimulate growth among agro-pastoral Maasai of Narok and Kajiado counties.

References


Smallholder Adaptation to Climate Change and Participatory Research and Extension

Rachel Odhner
Cornell University
1011 North Aurora Street. Ithaca, NY 14850
+1 585.944.8618 / rro6@cornell.edu

Terry W. Tucker
Cornell University

Keywords: climate change adaptation; participatory extension; knowledge; scale; Latin America

Introduction
Small-scale farmers of the global South are expected to suffer among the most immediate and severe effects of climate change (Morton 2007). Helping farmers adapt to climate change is now one of the central challenges of agricultural research and extension. This paper examines one aspect of this complex challenge: the place of local and farmers’ knowledge, as well as the need for participatory research and attention to scale in the creation of adaptive strategies. Effectively addressing climate change adaptation in particular places requires not only solutions derived from agricultural research and technology, but also local-level, community-based research and extension that is premised on a collaboration between scientists, extensionists and farmers (Valdivia et. al 2011). We present a case study of a climate-smart agriculture project in Nicaragua and Colombia as a departure point for discussing scale and knowledge in the context of climate change adaptation interventions. Farmers’ knowledge about the land, weather, climate, and cultivation need to be taken seriously and synthesized with scientific knowledge about climate change, in order to create effective adaptive strategies that are locally specific. Embracing epistemological pluralism and working toward effective knowledge integration are therefore key themes in planning extension work that meets the new complexities and challenges of climate change.

Objectives
The purpose of this paper is explore how the emerging framework of agricultural adaptation to climate change is an opportunity to reconceptualize how we plan and implement extension work. An ethnographic case study of a climate smart agriculture initiative is presented to show that careful attention to scale, incorporation of farmers’ place and experience-based knowledges, and other forms of participation are necessary components of creating effective adaptive strategies. We emphasize that the uncertainties associated with climate change make the importance of local-level, community-based research and extension more important than ever. The case study serves as a departure point for discussing the importance of scale and integration of epistemological frameworks in the context of adaptation interventions. We argue that local-level participatory extension that integrates farmers’ knowledges with scientific tools such as agroclimatic forecasts and drought-resistant varieties, is one of the approaches that will lead to optimal adaptation of smallholders as they confront climate change.
Methods and Theoretical Themes

The paper examines an ethnographic case study of an agricultural research and extension platform that has emerged to address climate change adaptation among smallholder farmers: Climate smart villages (CSVs), or Territorios Sostenibles Adaptados al Clima (TeSAC). CSVs are led by the Climate Change, Agriculture, and Food Security (CCAFS) program, headquartered at the International Center for Tropical Agriculture (CIAT). Ethnographic research--namely participant observation and informal interviews--conducted in 2015 among CIAT scientists and farmers participating in the CSV project in Nicaragua and Colombia, sought to understand the early stages of this new model of research and intervention. Observations from the study inform a discussion of theoretical themes including: scale and the limitations of climate models, local knowledge and epistemological pluralism--namely, attempts to integrate scientific and local knowledges (Beckford and Barker 2012, Scoones and Thompson 1994, Valdivia et al 2010).

Results

The case study suggests a disjuncture in the communication of information between CIAT, partner organizations, and project participant farmers on the ground. The paper therefore suggests that CSVs, as well as other agricultural adaptation initiatives, need to achieve a better balance between scientific knowledge and predictions (ie. climate-crop models and agroclimatic forecasts) on the one hand, and farmer’s place- and experience-based knowledges on the ground. In addition to the logistical challenges of scaling down crop models (Roscoe 2014, Valdivia et. al 2010), uncertainty in future climate and its effects on agriculture remains; the models have significant limitations (Roscoe 2014). Understanding the local impacts of climate change on agriculture in specific places, and designing effective adaptive strategies thus requires recognizing the limitations of scientific knowledge and taking seriously what farmers know about their land, and what they’ve observed and experienced in terms of recent environmental change.

In the realms of research, extension, and development, our understandings of what constitutes knowledge worthy of scientific attention, are becoming more malleable. Successfully helping small-scale farmers adapt to climate change requires not only interdisciplinary, but also what Murphy (2011) terms “inter-epistemological,” approaches to research and interventions. An inter-epistemological approach is one such as that described in Valdivia et. al (2011), in which local farmers’ knowledges are the starting point, and scientific knowledge (ie. climate forecasts and models, agronomic expertise) is considered alongside these existing frameworks of farmer knowledge, experience, and observation. This is the sort of shift that Rickards (2015) calls for: she highlights the question of power in climate change research, and argues that in order to successfully confront climate change, we need to “change the intellectual climate.” As researchers and extensionists, we must critically assess, not simply add to, prevailing knowledge frameworks. We need to critically challenge and continue changing how we conduct research and conceive of knowledge.

Recommendations

Creating successful adaptive strategies to climate change requires local-level research that is participatory, community-based, and incorporates farmers’ expertise--including their knowledge of their land and place. Such local, place-based knowledge of farmers is a vital component of developing successful adaptive strategies to mitigate the negative impacts of climate change (Prolinnova 2011). Further research could shed light on how extension
practitioners can work with agriculturalists to integrate scientific knowledge and local knowledges about the land, weather, climate, and agricultural production. Such epistemological pluralism will strengthen our ability as researchers, extensionists, and development practitioners to promote climate adaptation, as well as move us toward extension work as a truly mutual engagement. A second critical task and area for further research is developing the role of extensionists in building local capacity for collective action in the face of climate change. Alongside agricultural adaptation, communities’ capacity for organization and collective action will also be key to their resilience, and extension has an important role to play in helping smallholders build this capacity as they cope with climate change.

References


Small-Scale Farmer Perceptions of Agricultural Information Sources in Northern Haiti

Priscilla Zelaya  
University of Florida  
411 Rolfs Hall  
P.O. Box 110540  
Gainesville, FL 32611  
Phone: 352-273-3425  
Fax: 352-392-9585  
prisz25@ufl.edu

Amy Harder  
University of Florida

T. Grady Roberts  
University of Florida

Keywords: Haiti, Farmers, Cap-Haitian, Services, Agriculture

Introduction
Agriculture is a staple labor sector in Haiti, engaging 60% of the population (USAID, 2011) with small subsistence farmers representing 50% of the labor force (Eneas, 2010). Agricultural advisory services have recently been increasing worldwide (Birner et al., 2006). In Haiti, information for improving production has not been adequately provided for all farmers (PID, 2011). This study focused on information channels of small-scale farmers in the North Department of Haiti.

Literature Review
The Ministry of Agriculture, Natural Resources and Rural Development (MARDNR) in Haiti is working to strengthen the structure of its advisory services within its ten departments (USAID, 2011). In Haiti the presence of nongovernmental organizations (NGOs) is overwhelming (Kristoff & Panarelli, 2010). The multitude of entities offering free advisory services created challenges for the government to effectively reach all farmers (MARNDR, 2010). Little is known about the quality of information channels of small-scale farmers in Northern Haiti.

Purpose and Objectives
The purpose of this study was to describe the specific experiences of small-scale farmers in the North Department of Haiti in regards to the sources of information used to improve production practices. The following research objectives guided the study: (a) determine the type of information channels used by small-scale farmers, (b) determine the accessibility of quality information as perceived by small-scale farmers, and (c) identify potential gaps in information accessibility as perceived by small-scale farmers.
Methodology

This study used a basic qualitative design (Merriam, 2009). The population included small-scale farmers from the North Department of Haiti. An established relationship between the lead researcher and a local NGO allowed for access to this area. For the purposes of this study, small-scale farmers were defined as those having 2 or less hectares of land (Hazell, Poulton, Wiggins, & Dorward, 2010; USAID, 2011). Farmers were from the following communes: Limbè, Limonade, and Grand Rivière du Nord. They were selected on recommendations of local agronomists due to their regional agricultural significance.

Snowball sampling was chosen for this study (Merriam, 2009). This method was selected due to the lack of a complete list of farmers within this department. The sample size for this study was 21 farmers, 7 from each of the three communes.

Data collection occurred June - July of 2015. Data were collected through semi-structured interviews. The questionnaire used for the interviews was modified to fit the context of Haiti with permission from the author of a similar study (Moore, 2014). The interviews ranged from 4 - 15 minutes and were conducted in Haitian-Creole. The researcher traveled to the locations with the help of a student agronomist at a local Haitian university, who served as a research assistant. Due to an observed expectation from farmers that an outsider should pay for their input, which posed a potential bias (Ary et al., 2014), the research assistant conducted most of the interviews. The data were analyzed July – August, 2015. The constant comparative method was used following protocol recommended by (Merriam, 2009).

Lincoln and Guba’s (1967) framework for establishing trustworthiness was followed through triangulation of the data from audio and written transcriptions, anecdotal notes, peer debriefing, and thick description. Member checks were not possible due to limitations on time and resources. The lead researcher is currently involved in projects within Northern Haiti, which could present subjectivity biases in the study.

Results

Themes identified from the farmer interviews were categorized into three major categories: information sources of farmers, farmer perceptions of access to information, and farmer perceptions of barriers. Coding was used when including direct quotes from the interviews. Cities are designated with a letter: Limbè (B), Limonade (L), and Grand Riviere du Nord (G). Interviews within cities were given a number 1-7.

Information Sources of Farmers

Varied information sources.

Farmers indicated various sources for their knowledge of farming practices. Transmission of knowledge from parents was evident (2B, 6G, 7G). Some farmers had previous interactions with service providers in their areas (1B, 1G, 4G, 5B, 6G), while others stated being their own source of knowledge through experience (2G, 3G, 5G, 5B). Farmers recognized training needs by stating “we are limited in knowledge” (7G).

Farmer Perceptions of Access to Information

Outsiders and insiders.

Farmers spoke about their knowledge of groups reaching their areas (1B, 1G, 2G, 3L, 4B, 4G, 5G, 5L, 6G). Their interactions with these groups varied. While some were benefitting from
these service providers (1B, 1G), others stated they were not “invited” to attend (2G, 3L, 4B, 5G, 5L, 6G).

Lack of trust in service providers.

Lack of trust in service providers was evident among the farmers. They expressed how government officials would visit their farms while “running for” (3L, 6L) positions. Farmers described instances where service providers made promises concerning help they had yet to fulfill (1B, 6L, 2G).

Farmer Perceptions of Barriers

External locus of control.

In several instances farmers indicated how their success in agriculture directly depends on forces beyond of their control. These forces included “God” (1L, 4B, 5G), the “weather” (3L, 7L, 4G, 5G), or government and organizational provisions (6L, 4G, 5G, 6G, 7B).

Nature as an adversary.

Farmers viewed nature as an adversary to their production. Farmers frequently mentioned the “sun” (1G, 1L, 2B, 2G, 3G, 4B, 4G, 4L, 5B, 6L, 7G, 7L) as a source of death. Farmers also indicated wild animals (1L, 2B, 4B) and insects (1B, 1G, 2G, 4G, 7G) as adversaries.

Implications

Haitian farmers in the North Department gain their information for farming from a variety of sources, which is not necessarily by choice. Feelings expressed often reflect distrust and powerlessness. For extension, this poses a significant challenge. Programs must seek to provide relevant information while working against cultural mindsets, which emphasize external loci of control. These results highlight the need for future studies on the specific programmatic needs of small-scale farmers and the perceptions of service providers in the region. This study indicates needs for programs targeted to help farmers in this region. This information can serve to improve the services provided to smallholder farmers in the Northern Department of Haiti.

References


Stirring the Philosophical Waters for Youth Development through a Project-based Approach: Integrating Agripreneurship and Service-Learning

Richie Roberts
Oklahoma State University
Department of Agricultural Education, Communications & Leadership
Agricultural Hall, Room 448
Stillwater, Oklahoma 74078-6032
Tel. #: 405-744-2972
richie.roberts@okstate.edu

Stephen C. Mukembo
Oklahoma State University

M. Craig Edwards*, Ph.D.
Oklahoma State University

Keywords: agripreneurship, problem-based learning, service-learning, youth

Introduction
Actors in international agricultural development have made impressive strides in improving quality of life in many developing countries (DeJanvry, 2010). However, as the world’s population increases, some (DeJanvry, 2010) suggest that efforts have stagnated. This may be especially true regarding efforts to involve youth of developing countries in agriculture (Mukembo, Edwards, Ramsey, & Henneberry, 2014). Therefore, a need existed to identify strategies that might stir the interest of youth to engage in agriculture.

The International Labor Organization [ILO] (2014) suggested that engaging youth in agricultural entrepreneurship projects, i.e., agripreneurship, might help address this issue. Agripreneurship allows students to apply classroom concepts through an agricultural project. These ventures show promise for helping youth in developing countries to overcome numerous challenges (ILO, 2014; International Youth Foundation [IYF], 2014; Montpellier, 2014). Despite agripreneurship’s potential, trends in generational research demonstrate today’s youth – more than any generation before – desire that their work make a difference (Benn & Dunphy, 2009; Ismail & Lu, 2014). Agripreneurship, therefore, may lack a critical service element making it unattractive to some youth.

A popular method used to merge project-based learning (PBL) with elements of service is service-learning (Brower, 2011). Service-learning allows students to apply their learning to a service-oriented project and critically reflect on the experience (Bringle & Hatcher, 1995). Service-learning has strong roots in U.S. school-based, agricultural education [SBAE] (Roberts & Edwards, 2015). Critics, however, have questioned service-learning’s worth due to its lack of attention to entrepreneurship (Hinton, Orbal, & Mehta, 2014), which could include agricultural enterprises. A need exists to explore whether such an approach holds potential for youth and community development in developing countries; this constituted the study’s purpose.

Objectives
We will explain how agripreneurship and service-learning could be integrated through
PBL. Of note, the aim of philosophical inquiry is not to offer empirical truths, but rather stir debate and thoughts that push disciplines forward (Reichling, 1996). We, therefore, offer the following discussion.

**Philosophical Themes**

This section presents principles of agripreneurship and service-learning and how PBL could integrate both methods to support learning.

**Agripreneurship**

Agripreneurship conflates agricultural concepts with the principles that govern entrepreneurship (Lans, Seuneke, & Klekx, 2013). If combined, students have opportunities to apply content learned in their classrooms to the real world through the PBL method (Mills & Tregust, 2003). Some scholars (Nilson, 2010; Thomas, 2000) suggest educators adopt a facilitator approach when using this method to promote deeper problem-solving skills in students.

Other advantages include the development of practical skills, improved student interest, opportunities to contribute to the local economy, and potential to improve food security (Bairwa, Lakra, Bushaha, Meena, & Kumar, 2014; Rajaei, Yaghoubi, & Donyaei, 2011; Yaghoubi, 2010). Despite its advantages, efforts to diffuse agripreneurship are complicated because many youth in developing countries hold negative perceptions of agriculture (IYF, 2014). Moreover, today’s youth prefer their time and efforts contribute to society (Benn & Dunphy, 2009; Ismail & Lu, 2014), so enriching agripreneurship by emphasizing service-learning may provide important incentives.

**Service-Learning**

Service-learning has rich history as a pedagogical approach (Franta, 1994; Giles & Eyler, 1994), especially concerning SBAE in the United States (Roberts & Edwards, 2015). Bringle and Hatcher (2005) explained service-learning requires students to apply concepts learned in school to community issues with the intent of making a positive difference. Students reflect on their experiences and make important connections about how learning in school can be used to solve complex issues in their communities (Bringle & Hatcher, 1995). Although opinions differ on how service-learning should be delivered, Kaye’s (2010) framework remains a popular approach (Lake & Winterbottom, 2015). Kaye (2010) argued service-learning has five critical elements – investigation, preparation and planning, action, reflection, and demonstration – and posited students gain critical skills enabling them to transfer their learning to solve real-world problems.

The most consistently reported outcomes of service-learning include academic learning, motivation, moral development, civic engagement, and social responsibility (Ash & Clayton, 2009; Berkowitz & Bier, 2014; Iverson & James, 2013). However, Hinton et al. (2014) critiqued some forms of service-learning as lacking entrepreneurial components, which they considered key to addressing global development challenges. The integration of agripreneurship with the service-learning framework may enhance its effectiveness.

**Integrating Agripreneurship and Service-Learning**

Each approach draws from and complements principles of PBL (Bairwa et al., 2014). The integration, however, suggests new and exciting possibilities for student learning. Students would begin this process by investigating agripreneurial projects having relevance in their community. Students should focus on ventures that allow them to apply learning from their coursework to address a local issue or problem. After discovering an area of interest, students would partner with local agriculturists to create a plan. Thereafter, students would take action to
initiate their project. During the assignment, teachers facilitate purposeful reflection by students and their community partners. Finally, students demonstrate what they learned and how it impacted their community. Students’ learning could be exhibited various ways: develop a presentation for their school and community, speak with local media, or create a photo illustration for display (Kaye, 2010).

Case Illustration

Too often, philosophical discussions about education are distant from the real world. However, we contend the advantages of integration lie in practical application and impactful results. During our presentation, we will offer several illustrative cases demonstrating what this approach could look like in real-world contexts.

Educational Importance, Implications, and Recommendations

The integration of agripreneurship and service-learning through PBL holds valuable potential for youth development. For instance, students could gain meaningful problem-solving skills in context-rich settings (Lans et al., 2013; Roberts & Edwards, 2015). By encouraging interaction and problem-solving with local agriculturists, the students stand to gain valuable insights from adults with years of work experience in their communities. The adults are also likely to learn. Solutions to local issues may be generated by co-creating new knowledge (Navarro, 2008), a concept frequently absent from many classrooms (Ash & Clayton, 2009). We recommend agricultural and extension educators consider using the principles outlined. Additional research should seek to further clarify advantages and challenges associated with this approach to learning.

References


Student Recruitment and Retention in a College of Agriculture: Student Insight on Educational Foci

M’Randa R. Sandlin
Department of Tropical Plant & Soil Sciences
University of Hawai‘i at Mānoa
3190 Maile Way, St. John 102
Honolulu, HI 96822-2279
808-956-7232
msandlin@hawaii.edu

Kauahi Perez
Department of Tropical Plant & Soil Sciences
University of Hawai‘i at Mānoa

Keywords: Recruitment, Retention, Educational Foci, Andragogical Process Model, Student Perspectives

Introduction
Student recruitment and retention in agricultural programs is a concern for agricultural educators. Researchers have studied learner-centered concepts, such as motivations (Danjean, Bunch, & Blackburn, 2015; Irlbeck, Adams, Akers, Burris, & Jones, 2014) and apathy (De Lay & Swan, 2014), to identify recruitment, curriculum design, and retention strategies. Curriculum design (Ndwandwe & Dlamini, 2013), training methods (Cai, Rodriguez, & Abbott, 2014; McDermott, Murphrey, & Wingenbach, 2013) and other program design methods have also been studied in this same quest. Levin (2000) and Platz (1994) found direct learner involvement to be a key component in educational decision making processes, as it leads to learner engagement, buy-in, relevance, and retention in educational programming.

Administration and faculty in the College of Tropical Agriculture and Human Resources (CTAHR) developed four educational foci to describe the areas in which students are trained as learners. These foci are meant to present CTAHR programs in an interdisciplinary format to guide students into their preferred field of study earlier in their academic career to increase student recruitment and retention.

Theoretical Framework
The andragogical process model was used as a framework for this study (Knowles, Holton, & Swanson, 2011). This model exemplifies the collaborative planning and execution processes that occur between the instructor and the learners in an educational environment. In the planning stage of the process model, instructors and learners work together to set educational goals and expectations. Collaborative efforts encourage learning engagement and interest because learners find relevance, ownership, and motivation in the experience (Knowles et al., 2011).

Methods
Data were collected from students in CTAHR and the Department of Biology at University of Hawai‘i at Mānoa (UHM). Biology students were chosen to provide an outside perspective because they have similar academic requirements as CTAHR students. Eleven total students...
participated, nine CTAHR students and two Biology students. Students were purposefully chosen (Lincoln & Guba, 1985) based on the following criteria: Enrolled as an undergraduate in UHM, degree seeking in CTAHR or Biology, and a junior or senior by academic hours. No identifying information was collected.

Focus group methods were used to collect data from CTAHR students. Students read a draft of the four foci descriptions before the focus group to inform the conversation. A semi-structured interview protocol was created to guide the conversation. Students were coded Ag1-9.

Survey methods were used to collect data from Biology students after failed attempts to conduct a focus group. Biology students were emailed the foci descriptions and a questionnaire about the foci. The questionnaire was a tailored version of the protocol used in the focus group. Students were coded Bio1-2.

The constant comparative method was used to analyze the data (Glaser & Strauss, 1967). Credibility was established through triangulation; transferability was established through purposive sampling; and dependability and confirmability were established through the creation of an audit trail and reflexive journal (Lincoln & Guba, 1985). Four themes emerged from the data: (a) Uses of educational foci, (b) accuracy of foci, (c) suggestions to improve the foci, and (d) foci titles.

**Results**

Students found the uses of educational foci attractive because they allow students to know what to expect in their field of study (Ag1, Ag2, Ag3), to make interdisciplinary connections (Ag1-Ag9), and to “specialize while maintaining a broader grasp” (Bio1) of the study area. All CTAHR students mentioned interdisciplinary exposure as a critical component in their personal career success. Students further indicated the foci could attract potential students, provide insight into educational pathways and careers, and would give students an opportunity to pursue their interests “while still receiving a comprehensive education” (Bio2).

The CTAHR students were concerned with the accuracy of the foci descriptions. They felt some of the information inaccurately represented what CTAHR is doing. For example, student Bio2 liked the sustainability components, but student Ag9 stated, “If someone was to look at courses they can take for sustainability…the reality is those aren’t available.” Additionally, students mentioned the exaggerated use of cultural terms into the descriptions (Ag2, Ag3, Ag9). “Focus 3 mentions ‘ahupua’a’a’ and I have never heard anything related to our ‘ahupua’a’a’ in the environmental stuff that I’ve done in CTAHR” (Ag2).

Students were asked to provide points of improvement. Students found the topics of aquaculture (Bio1), forestry, fuel, and ethics (Bio2) to be missing and did not feel the descriptions articulate CTAHR’s current and potential global contributions (Ag2, Ag6, Ag9). Further, students felt the foci descriptions lacked student relevance. “These are words that old professors come up with” (Ag6). The foci should begin with a concise summary statement (Ag3) and include buzz words (Ag1, Ag6, Bio1-2). “I like big, bold statements. ‘I go to CTAHR to train to become a superhero and save the world’” (Ag6).

The students suggested titles for the foci and the faculty and administration agreed with and formally titled the educational foci as: Community Health and Resiliency, Food and Agricultural Systems, Environment and Ecosystem Management, and Global Markets and Innovative Design.
Conclusions and Recommendations

From the findings of this study, it can be concluded that the foci development and implementation without student input may have been unsuccessful for recruitment and retention in CTAHR. Levin (2000) found educational reform to be unsuccessful without learner input and students must be motivated to engage in their education (Danjean et al., 2015; Irlbeck et al., 2014). Although participating students found the foci attractive, they found fault in the content and cultural accuracy. Furthermore, students felt the original foci descriptions lacked student relevancy. Like educators, students are also interested in engaging learning experiences (Cai et al., 2014; McDermott et al., 2013; Ndwandwe & Dlamini, 2013).

This study highlights the need for learner engagement in educational decision making processes. To increase recruitment and retention in programs of agricultural education, specifically those with adult learners (i.e., higher education and extension), it is recommended that agricultural educators at all levels seek input from learners inside and outside of the program to create programming that is relevant, engaging and motivating for students (Knowles et al., 2011; Levin, 2000). Future studies should be conducted to measure the success of such programmatic alignment on recruitment and retention.

References


Technical Skills Needed by Animal Husbandry Teachers to Train Employment-Ready Graduates of Senior Secondary Schools in the Niger-Delta of Nigeria

Canice N. Ikeoji  
Professor  
Department of Vocational Education  
Delta State University, Abraka, Nigeria  
cnamek@yahoo.com  
+2348035063264

C. Ogwu  
Lecturer  
Department of Vocational Education  
Delta State University, Abraka

Keywords: Needs assessment, Technical skills, Animal Husbandry, Senior secondary school graduate

Introduction

Educational reforms in Nigeria, among other revisions, shifted focus to skill training and realignment of curricula to meet emerging need of a global economy and knowledge society (UNESCO, 2007). The Federal Government of Nigeria (FRN) accordingly launched the new Senior Secondary School Trade Curriculum (SSSTC) in September, 2011, starting with Senior Secondary (SS) I, while “the old curriculum would be systematically phased out by June 2014” (NERDC, 2011:2). The new curriculum also aims at “producing secondary school graduates… having relevant functional trade and entrepreneurship skills needed for poverty eradication, job creation and wealth creation” (..p.2), as well as preparing people for entry or advancement in agricultural occupations and professions (Phipps, Osborne, Dyer and Ball, 2008). Thirty four new Trades/Entrepreneurship subjects were introduced into the curriculum, one of which is Animal Husbandry. Teachers need to be better prepared to face this new challenge through adequate needs assessment, particularly with regards to technical skills needed to produce employment-ready graduates of Animal Husbandry. This becomes necessary because over 30% of high school graduates seeking employment were not provided the necessary skills in high school which has resulted in high unemployment (Gray and Herr, 2006).

This study used the Human Capital Theory (HCT) as the theoretical framework for the assessment in line with van Loo & Rocco (2004), who remarked on HCT, as “an investment in skills and knowledge” (p. 99).

Purpose/ Objectives

The purpose of this study was to assess the technical skills needed by Animal Husbandry teachers to produce employment-ready graduates of senior secondary schools in the Niger-Delta part of Nigeria. Objectives of the study included, to: 1) determine the importance ratings and level of skill possession as perceived by the Animal Husbandry teachers in Niger Delta of Nigeria, 2) prioritize technical skills needed by the teachers using the Mean Weighted Discrepancy Scores (MWDS) as prescribed by Borich, (1980), 3) determine preferred training modes by the teachers.
Methodology

There were 217 Animal Husbandry teachers identified across 5 states of the Niger-Delta namely: Delta, Edo, Bayelsa, Rivers and Akwa-Ibom States in Nigeria. Data were collected from 113 such teachers during June to August 2015. The survey instrument consisted of two parts: (a) items requesting for personal demographic and professional characteristics; (b) 52 identified technical skills in Animal Husbandry developed into 11 themes in line with the curriculum for the subject were used to develop an instrument which enabled the teachers to indicate (a) their assessment of how important they considered the technical skills, and (b) the level of possession of such skills in Animal Husbandry. Both scales for the importance and possession ratings were rated on a 5-point scales ranging from 1 = not important to 5 = extremely important, and the other ranging from 1 = not possessed to 5 = extremely possessed. MWDS were computed for all items and used to prioritize the training needs in technical skills for the teachers.

Results

Six technical skills in Animal Husbandry with the greatest needs for further training were: (a) perform progeny analysis (MWDS = 7.42), (b) apply various animal improvement methods (MWDS = 7.22), (c) vaccinate animals for disease prevention (MWDS = 6.91); (d) identify symptoms of animal diseases (MWDS = 6.41), (e) formulate livestock rations (MWDS = 5.82), and (f) apply basic computational skills (MWDS = 5.83). Respondents did not differ significantly among themselves with regards to their mean ratings of importance and level of possession across the five states of study. The teachers preferred short duration vacation training workshops, conferences, and engagement of accredited livestock farmers for school demonstration as training modes.

Conclusions, Recommendations, and Implications

The results showed that 47 out of the 52 technical skills had positive MWDS pointing towards high level of need among the teachers. The identified technical skill needs were consistent with expectations in the new curriculum which “should reflect the needs of industry” (Roberts of Ball, 2009). It is recommended that the identified technical skills in Animal Husbandry be built into training modules by the ministry of education to provide the needed training using the preferred modes. The findings of this study present far reaching implications for teacher education providers in universities and colleges of education that produce Career and Technical Education teachers in Nigeria.

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Bassim H.Kashash
Agriculture College, AL-Qasim green university, Babylon, Iraq
e-mail:bassimhaleem@yahoo.com
Phone: +9647811970465

Thamir Al-Janabi
College of Agriculture and Life Sciences
Mississippi State University
College of Agriculture
Al-Qassim Green University, Babylon, Iraq
e-mail: tna68@msstate.edu
Phone: +16625181026

Keywords: training needs, farm women, dairy farming, Iraq.

Introduction
Dairy cows in small holders contribute to improve the welfare of farm households, It generates income, provides a highly nutritious food for people, create employment opportunities in the society (Nga et. al., 2012). In most of Iraqi rural communities, livestock production system is spreads, which includes raising small numbers of livestock. The small-scale livestock farmers, sometimes referred to as smallholder farmers, are mainly categorized by the livestock numbers (Ogunkoya, 2014). Women have been involved in animal production under small holder farming system (Batool et al., 2014). The responsibility of all sorts of activities involved in animal husbandry occupation is shouldered by the farm women (Naik et al., 2014), and most of the critical roles related to livestock farming are played by the women (Moser, 2007). Dairy farming is major occupation of rural women in Iraqi villages. The ability of the dairy farm women to increase productivity and generate more income from dairying depends on the effective use and application of improved dairy farming practices. Dairy development strategy at the smallholder level requires some change in knowledge and management skills, which calls for training on improved dairy farming practices (Murai & Sing , 2011).

Some studies have been conducted on training needs of dairy farm women such as (jacop and george, 2013), (Kanwat and Singh , 2014) , ( Kavithaa and Rajkumar , 2014). They summarized the main aspects of dairy farming practices as health care , feeding, breeding, clean milk production, marketing and finance and housing. The mostly sub aspects needed for training are selection of breed, feeding during pregnancy, balanced diet, care of pregnant animals and new born calf , correct procedure of milking, animal milk production, animal hygiene and management, making feed concentrate, how to identify symptoms of common diseases, how to treat common animal diseases and fodder production.

Objective of the Study
The objective of this study was to identifying the training needs of farm women in some dairy farming practices.
Research Methodology

The study was conducted in Al-Saniya district of Al-Qadisyah Province, Iraq. A total of 125 women farmers were interviewed. The questionnaire consisted of two parts. First part consisted of general information about the women characteristics. The second part included four-point rating scales scored as (4 = strongly needed, 3 = moderate needed, 2 = least needed, 1 = not needed). Face to face interview was used and data collected personally during the period 1-25 August 2015. The data collected for this study was analyzed using frequency, percentage, and weighted arithmetic mean.

Results/Conclusion

The findings revealed that the mean age of respondents was (37.7) years, the average of experience years in dairy farming was (23.8), and the average number of dairy cow per family was (4.6). With respect to overall preference of training need of rural women on some dairy farming practices, health care as the most preferred training area of rural women (M=3.6) followed by feeding (M=3.1), clean milk production (M=2.6), breeding (2.1), and marketing (M=1.6). With reference to training needs about sub-items of animal health care, Care and management of milking animals, Disease Prevention, Symptoms of common diseases was assigned first rank (M=3.9) followed by information on infectious diseases(3.8), and Care and management of sick animals, Sterility treatment, Precaution against parasitic diseases (M=3.7).

Regarding training needs about feeding practices, feeding of milk animals was assigned first rank (M=3.7) followed by importance of feeding mineral mixture (M=3.6), feeding of pregnant animals (M=3.5), feeding of new born calves (M=3.3) and advantage of compounded (M=3.2). Under clean milk production the farm women needed training the most on preparation of milk products (M=3.4) and knowledge of zoonotic disease that spread through infected milk (M=3.3). Rural women training need concerned with respect to breeding are breeding program (M=3.5), rearing the calves (M=3.4), repeat breeding management (M=3.2) and reproductive efficiency of dairy animal (M=3.1). About the training need with respect to marketing, marketing of products was in first rank (M=1.9) followed by milk marketing (M=1.8).

Recommendations

Based on the findings of this study, the following recommendations are made:

1. Training course should be conducted for dairy farm women in areas where respondents showed a middle and high level of training needs.
2. A women training center should be established at Al-Saniya District.

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Thomas Hall
Assistant Director for International Training
Norman E. Borlaug Institute for International Agriculture
Texas A&M AgriLife
578 John Kimbrough Blvd.
2477 TAMU
College Station, TX 77843-2477
Office: 979-862-1950
Fax: 979-845-5663
Thomas.Hall@ag.tamu.edu

Robert Strong
Texas A&M University

Keywords: Tunisian Ministry of Agriculture, training needs, cooperatives, Borich Model

Introduction and Theoretical Framework
Tunisia became the birthplace of the Arab Spring in 2011, which produced democracies in a number of countries (Eva, 2012; Halverson, Ruston, & Trethewey, 2013). Due to the freedom of a young democracy, the Tunisian Parliament enacted laws to help the country feed itself and for farmers to become more profitable (Lotan et al., 2011). The development and sustainability of agricultural cooperatives in Tunisian are mandatory due to national law (United States Embassy - Tunisia, 2012). The Tunisian Ministry of Agriculture has a Cooperative Division composed of individuals serving as extension officers that work with farmers to establish and oversee cooperatives. The majority of cooperatives are commodity specific but some service-based agricultural cooperatives exist.

Need refers to an individual’s want or desire producing a felt need (Borich, 1980). Adult learning literature indicated four types of individual needs: basic needs, felt and expressed needs, comparative needs, and normative needs. Normative needs represent a gap between an appropriate paradigm and the paradigm present (Monette, 1997). Brown (2002) suggested training needs more closely align with normative needs. This study was focused on training need which was defined by Brown (2002) as a discrepancy hindering the performance of employees and reducing economic and social impact of organizations.

Purpose and Objectives
The purpose of this study was to examine further change agent training needs of Tunisian Ministry of Agriculture Cooperative’s Division employees. More specifically:
3. Describe Ministry of Agriculture Cooperative Division personnel’s perceived proficiency of adult training topics; and
4. Describe Ministry of Agriculture Cooperative Division personnel’s perceived importance of adult training topics.
Methodology

The study utilized a quantitative design and survey research to collect the data. A Borich needs assessment was developed by Texas A&M University and the United States Department of Agriculture and assessed by the Tunisian Ministry of Agriculture Cooperative Division administrators for internal validity. The Borich needs assessment was administered face-to-face at the conclusion of a training program. Participants rated two four point scales for proficiency and importance: 1 = No Proficiency/Importance, 2 = Low Proficiency/Importance, 3 = Average Proficiency/Importance, and 4 = High Proficiency/Importance. Each scale’s anchors were: No Proficiency/Importance = 1.00–1.50, Low Proficiency/Importance = 1.51–2.49, Average Proficiency/Importance = 2.50–3.49, and High Proficiency/Importance = 3.50–4.00.

The advantages of a Borich needs assessment are the quantity of data the instrument provides, the more comprehensibility of the data, and the ease the instrument can be implemented (Borich, 1980). A Borich needs assessment model involves, listing competencies, surveying trainers, ranking trainer’s competencies, comparing high priority competencies with training program content, and revising the program. The results of a Borich needs assessment provide organizations training discrepancies and highlights employee’s beliefs as to the training topics needed to improve employee performance (Borich, 1980). The limitation of the Borich model is the self-reported nature of the data.

Thirty-three individuals participated in the training and a census was utilized since the population was small. Thirty-three (N = 33) individuals completed the Borich needs assessment. One respondent was removed due to incomplete information. The response rate was 97% (n = 32). The Borich instrument used in this study produced a reliability coefficient of .97.

Borich’s (1980) procedure for calculating discrepancy scores and ranking competencies was utilized. The sixteen professional competencies were then ranked using the mean weighted discrepancy scores. The discrepancy model developed by Borich (1980) is broadly utilized in agricultural and extension education (Harder, Ganpat, Moore, Strong, & Lindner, 2013; Mudukuti & Miller, 2002; Perez-Dlamini, Mbingo, & Dlamini, 2003; Roberts, Ganpat, Narine, Heinert, & Rodriguez, 2015) and the instrument was assessed as the best option to achieve the study’s objectives.

Findings and Conclusions

The first objective was to describe the respondents’ self-perceived levels of proficiency of change agent topics. Due to space limitations of the abstract, only the competencies with the five highest means for the overall group have been presented. Five competencies were identified as those for which Ministry of Agriculture personnel perceived themselves to be most proficient. The only competency for which all respondents’ considered themselves to be highly proficient was Disseminating information to a cooperative. Ministry of Agriculture officials had similarly positive perceptions of their proficiency for three other competencies: Understanding why farmers chose to participate in a cooperative, Identify farmers who serve as opinion leaders for other farmers, and Communicating the advantages of joining a cooperative to farmers. The four competencies that Ministry of Agriculture personnel felt the least proficient were Training leaders of cooperatives, Helping farmers adopt innovations, Being able to influence cooperative’s decisions to adopt innovations, and Developing an approach to overcome a farmer’s resistance to change.

The second objective was to describe the perceived level of importance assigned by Ministry of Agriculture personnel change agent competencies. As with the first objective, only
the competencies with the five highest means have been presented. Five competencies were identified as the most important for their role as a change agent working with cooperatives. The competencies with the five highest means in the group were *Working with cooperative leaders to initiate change*, *Training leaders of cooperatives*, *Motivating farmers to participate in cooperatives*, *Understanding group relationships within the cooperative*, and *Understanding interpersonal relationships within the cooperative*. Little variation in perceptions were observed in the change agent’s ratings of the most important competencies as compared to their self-perceptions of proficiency.

**Recommendations, Educational Importance, Implications**

Cooperatives are democratically controlled by member-patrons and are based on equity and equality (International Co-operative Alliance, 2015) and as such cooperatives demonstrate democratic principles to the residences of the community and citizens of the nation. As a newly minted democracy, local cooperatives allow the reinforcement of democratic principles in Tunisia. When agricultural cooperatives are successful they can provide stability to the food system which may lead to increased food availability for Tunisians (Food and Agriculture Organization, 2013). To aid Tunisian cooperatives in mitigating food insecurity, the Ministry of Agriculture must provide training experiences to Cooperative Division personnel’s to increase capacity of change agents in the context of adult training, learning and dissemination of knowledge.

**References**


The Savelugu-Nanton Extension Delivery Improvement Project (SNEDIP): A Case for Cost-Effective District-Level Extension Strengthening

Austen Moore
Post-Doctoral Researcher
Modernizing Extension & Advisory Services (MEAS) Project
University of Illinois
212 Mumford Hall MC-710
1301 W. Gregory Drive
Urbana, IL 61801 USA
Phone: 425-420-8131
Email: acmoore@illinois.edu

Keywords: extension strengthening, pluralism, farmers’ groups, Ghana

Introduction

Acute poverty and food insecurity affect northern Ghana, a region dominated by small-scale agriculture, harsh agroclimatic conditions, and poor access to inputs and technologies that limit agricultural production (Food and Agriculture Organization [FAO], n.d.; Wood, 2013). In response, the Ministry of Food and Agriculture (MoFA) prioritized forming farmer-based organizations (FBOs) and strengthening extension services (MoFA, 2007). However, operationalizing these transitions remains challenging. FBOs are poorly coordinated and lack capacity in market-oriented agriculture. Simultaneously, MoFA suffers from capacity, funding, and logistical constraints that affect the availability and quality of extension services (Modernizing Extension and Advisory Services [MEAS], 2012). Decentralization has also eroded financial allocations to extension, as local governments divert funds into other areas (e.g. health, education, infrastructure) (Amezah & Hesse, 2004). This contextual challenge is common across the developing world, yet cost-effective models for extension strengthening remain elusive.

To address this need, MEAS partnered with Engineers Without Borders Canada (EWB) to implement a pilot project in the Savelugu-Nanton district of Ghana. Through collaborative planning with district-level government, MoFA administrators, and MoFA Agricultural Extension Agents (AEAs), the Savelugu-Nanton Extension Delivery Improvement Project (SNEDIP) was created to increase farmers’ access to quality extension services and develop AEAs’ and farmers’ capacities in market-driven agriculture and post-harvest management, while piloting a financially “lean” and pluralistic approach.

Under SNEDIP, an existing 12-step curriculum called Agriculture as a Business (AAB) was used by EWB in bi-weekly trainings with 15 AEAs in Savelugu-Nanton, covering one AAB lesson per session. Each AEA then trained two FBOs through 12 weekly extension visits, one for each AAB lesson. MEAS provided fuel allowances to facilitate these visits.

Objectives

This study evaluated SNEDIP across its guiding objectives, namely to assess (a) changes in the frequency and quality of extension services provided to farmers, (b) capacity changes among AEAs and utilization of new skills, and (c) capacity changes of farmers and intention to adopt new techniques.
Methods

This study used a pretest posttest approach and pre-experimental design (Ary, Jacobs, & Sorensen, 2010). Project baseline and endline surveys measured changes among both AEAs and FBO members. Farmer and AEA surveys included questions on knowledge, skills, attitudes, and willingness to adopt new practices on each AAB topic, but also the frequency and quality of extension services. Respondents ranked answers along a five-level Likert-type scale (Rossi, Lipsey, & Freeman, 2004).

Farmer data \((n=103)\) were collected at FBO meetings with respondents identified via simple random sampling (Ary et al., 2010). Approximately 10% of SNEDIP farmers were sampled, and instruments were verbally delivered due to low literacy rates. AEA data \((n=14)\) were collected at pre-project and post-project sessions. Census sampling captured responses, although one AEA failed to complete the endline survey.

Data were analyzed by generating means for each question across farmer and AEA respondents and determining mean changes between baseline and endline data. Paired t-tests were used to determine the statistical significance of these differences (Agresti & Finlay, 2008).

Results

Results of SNEDIP showed strong achievement across all programmatic objectives. The 15 AEAs trained under SNEDIP conducted 384 visits to FBOs and directly served 1,067 farmers, with up to five times as many farmers served through secondary knowledge sharing. The frequency and quality of public extension visits increased by 22% and 6% respectively, based on farmer feedback.

Knowledge and skill changes were extremely positive among both AEAs and farmers. Across the 12 AAB topics plus ICT usage in extension, AEAs’ knowledge and skill (perceived capacity to use that knowledge) increased by 18% and 10% respectively. Largest capacity gains were in business planning, identifying market opportunities, and accessing/using agricultural credit. Utilization of these capacities was also high. AEAs conducted 12 trainings on all AAB topics, with one AEA who conducted only 10 due to illness. Knowledge and skill changes among farmers were +23% and +10% respectively, with financial management, record-keeping, and post-harvest storage showing particular improvement. Farmers also expressed intention to adopt 88% of the techniques learned through SNEDIP.

Recommendations/Implications

Clearly SNEDIP succeeded in meeting its programmatic objectives. However, the strength of the SNEDIP approach lies in its replicability and potential impact on extension programming in other contexts. Interventions like SNEDIP demonstrate that effective extension services can function on a small budget (~$85,000 for one district). This has significant implications, especially given the persistent resource constraints facing public extension across the developing world (Swanson, Bentz, & Sofranko, 1997). Showing impacts-over-costs and engaging local governments in extension planning and evaluation can motivate local leaders to allocate additional resources to extension (World Bank, 2000). Also, participatory and demand-driven agenda-setting that fully engages farmers can enhance ownership and support for public extension (Birner et al., 2006; Swanson et al., 1997). This emphasis, plus stronger and better coordinated FBOs, can lead to advocacy or lobbying efforts that further encourage local governments to fund extension and can produce more sustainable farmer-level results (Food,
Agriculture, and Natural Resources Policy Analysis Network [FANRPAN], n.d.). Similar effects were experienced through SNEDIP.

Furthermore, SNEDIP provides an example of effective pluralistic extension. Northern Ghana has seen a push for privatized and donor-led extension (United States Agency for International Development [USAID], 2011), often with MoFA officers seconded to these projects while struggling to implement their own work plans. This results in independent, parallel, and sometimes competing extension activities and a weakened public sector (Birner et al., 2006). Seconded officers gain project-specific skills but fail to develop more applicable capacities that strengthen the larger public extension system (MEAS, 2015).

In contrast, SNEDIP demonstrates effective pluralism by leveraging the relative strengths and resources of actors in the larger extension system (MEAS, 2015). By design, SNEDIP utilized external funding to build off of existing human resources and the available workforce in the public sector and development priorities identified by local actors. As a result, impacts to service delivery (e.g. increased capacities of AEAs and farmers) can pay future dividends beyond the funding cycle. While contextual differences may affect specific programming, the core of the SNEDIP model has clear replicability and value for a range of extension environments.

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Undecided or Decided: Using Mixed Methods to Explore Undergraduate Students’ Attitudes Towards Undocumented Immigration

Shuyang Qu
Graduate Student, University of Florida
Department of Agricultural Education and Communication
406 Rolfs Hall PO Box 110540
Gainesville, FL 32611
Ph: 515-231-7095
Email: jasminequ@ufl.edu

Caitlin Bletscher
University of Florida

Dr. Alexa J. Lamm
University of Florida

Keywords: Undergraduate students, color-blindness, mixed methods, focus group, immigration

Introduction

More than 900,000 undocumented immigrants are living in the Florida, United States (U.S.) (Chardy, 2014). This population played a significant role in the agricultural and natural resource industries in the U.S., where more than 50% of farmworkers were undocumented immigrants (Maxwell, 2012). As newly registered voters, undergraduate students’ opinions continued to influence policy-making. Immigration policy not only has an impact on the lives of immigrants, but also a variety of aspects including the wellbeing of U.S. citizens, employment, national security, and the prosperity of agricultural industries employing large number of undocumented immigrants. Stricter immigration policies have been considered in U.S. to protect national security, which can impact the agricultural industry adversely (Lamm, 2013).

This study aimed to explore undergraduate students’ attitudes towards undocumented immigration. The theoretical foundation guiding this study was schema theory (Piaget, 1952), explaining how, since childhood, people organized information into units, attempting to adapt the external world into pre-existing units (Piaget, 1952). Immigration issues have been commonly used in schema theory, explaining how pre-existing schemata play a significant role when people process new information, therefore influencing their attitudes toward immigration (Axelrod, 1973). Given the sensitive nature of these topics that need discussion and consideration, it is necessary to explore college students’ attitude, and their rationale behind the attitude. From such discussions, policymakers and communicators globally can create more effective messages that resonate with their audience’s attitude and to better inform their audience.

Purpose and Objectives

This study sought to determine undergraduate students’ attitude toward undocumented immigration, and rationales of their attitudes. Specific objectives were:

1. To determine undergraduate students’ attitude toward issues of undocumented immigration.
2. To compare undergraduate students’ attitude toward issues of undocumented immigration between sex, race, and year of college.
3. To explore rationales of respondents’ attitudes toward issues of undocumented immigration.

**Methodology**

This study used a dual-phase sequential explanatory mixed methods design. The quantitative data to provide a general portrait of the participants’ attitude towards undocumented immigration, and the qualitative data intended to explain the “why” from the quantitative data.

The population for this study was undergraduate students enrolled in a cross-disciplinary course at a land grant university (n = 189). In the first phase, 87 respondents completed the survey, generating a 45.5% response rate. Each student volunteered to answer 19 statements measuring attitudes toward issues about undocumented immigration on a five-point Likert-scale, and demographic characteristics including sex, race and ethnicity, and year of college (Clason & Dormody, 1994).

The second phase (qualitative) used one focus group to further understand students’ rationale of their attitude. This phase used a convenience sample of students (n=4) within the original population in order to assist in learning the central phenomenon (McMillan & Schumacher, 1994). Questions focused on respondents’ roles that undocumented immigrants play in the U.S., responsibilities of immigration issues, and requirement to become a U.S. citizen. Focus group was audio-recorded, and transcribed. Constant comparative method was used for analysis. Primary researcher and co-researchers discussed and verified the final themes.

**Results**

In general, survey results showed that respondents were undecided concerning their attitudes towards undocumented immigration in the United States (M=3.1).

Results showed female respondents had a significantly positive attitude than male (t = -2.10, p = .04) (M (male) = 2.82, M (female) = 3.19). T-test showed Hispanic had a significantly different attitude towards undocumented immigration than those who were not Hispanic (t = 2.18, p = .03). One-way ANOVA showed attitude differences existed among different races (Asian, Black, White and other). Post Hoc using Bonferroni test indicated white students (M = 2.84, SD = .62) had a significantly negative attitude than those who identified themselves as black (M = 3.85, SD = .93, p = .01). One-way ANOVA showed no significant difference among freshmen, sophomore, junior and senior respondents (F = 2.43, p = .07).

In the second phase, themes were identified from the focus group regarding participant’s attitude about undocumented immigration issues, including:

1) undocumented immigrants came here for a reason,
   “They [undocumented immigrants] do a lot of jobs that typical Americans don’t want to do. People who hire them can ensure they do the job because a) they are undocumented, b) options for them to get a job anywhere, or for them to get deported”.

2) People and government should help them.

3) Public opinions made undocumented immigration a tough issue,
   “It’s sort of being portrayed as a crime, people are portrayed as criminals, when they put privilege to themselves for their families. It’s an issue not necessarily they bring, but it’s almost like sort of like automatically drastic on to that.”

4) The process for immigrant to become a citizen is tough.
Discussion, Conclusion & Recommendations

The quantitative survey results showed college students had undecided attitudes towards immigrant citizenship, resources, and the allocation of U.S. citizens’ rights to undocumented immigrants. In addition, demographics variables including sex, race and ethnicity made significant differences to college students’ attitudes.

Phase two responses suggested that the pathway to citizenship is lengthy and unnecessary process, which leads to an unidentifiable solution to citizenship among this population and their children. Government and organizations were believed accountable for helping undocumented immigrants with resources to positively influence the society and public opinion.

While the results in phase one suggested undecided attitude, the researchers noted that focus group participants presented positive responses. This leads to further questions of whether students’ true attitudes were presented authentically and whether setting triggers students’ schemas differently.

Ultimately, students’ attitudes varied. The complexities of the issue generated different schemata of students with different background. Further research need to look at undergraduate students’ attitude towards undocumented immigration in other countries. On a global scope, researchers should engage new voters of varying demographics to determine their attitudes and schema towards immigration in order to better understand undecided issues. Colleges and universities globally should encourage students and faculty members to discuss these issues to educate students to be more literate on immigration.

References


Use of Animated Videos through Mobile Phones to Enhance Agricultural Knowledge and Adoption among Bean Farmers in Gúruê District, Mozambique

Sostino Mocumbe  
Graduate Student,  
Greenlee School of Journalism and Communication  
Iowa State University  
smocumbe@iastate.edu  
131 University VLG, Unit D  
(515) 357-2670

Eric Abbott  
Iowa State University

Robert Mazur  
Iowa State University

Julia Bello-Bravo  
University of Illinois

Barry P. Pittendrigh  
University of Illinois

Keywords: Animations, Videos, Mobile phones, Knowledge gain, Adoption, Farmers, Legumes.

Introduction

The lack of extension agents and the emergence of new portable electronic devices that can supplement or in some cases replace personal visits by extension agents are driving experimentation with use of mobile phones, smart phones, and other devices to reach farmers. In Mozambique, Davis (2008; 2009) found that only 13% of farmers were reached by extension.

To supplement efforts of extension agents, a number of new communication technologies have been tested. Mobile-phone-based systems using text messaging (Parker, Ramdas & Savva, 2012; Kachelriess-Matthess et al., 2011), interactive voice-based services (Agarwal, Kumar, Nanavati & Rajput, 2010; Kulkarni & Karwankar, 2012; Mishra, Chavan & Gourkar, 2012; Cole, Fernando, & Nilesh, 2012; Siraj, 2011; Masuki et al., 2010), market information (Pimental, Mocumbe & Francisco, 2009), and other services are now being widely used. As smartphones begin to penetrate rural areas, their video and information storage capabilities make them capable of storing, playing, and sharing agricultural information.

There also has been innovation in message design, including video or participatory video using local farmers and the use of animations. The use of video/animation/photovoice in messages has received special emphasis since many farmers are not literate (Gandhi, Veeraraghavan, Toyama & Ramprasad, 2007; David & Asamoah, 2011; Woodard, 2013; Bentley et al., 2013; Gervais & Rivard, 2013). In addition, at least some videos have been effective even when extension agents are not present (Bentley, 2013; Bentley et al., 2014; Cai, Abbott & Bwambale, 2013). Van Mele (2011) found that 77% of organizations training rural farmers are now using video as a part of their training. However, video produced to meet the
needs of each local community can be very expensive, and many areas lack technical equipment and staff needed to edit and produce them. While small-scale devices are becoming more capable of producing video, animation has special promise because a single animation can often be used across a number of different cultural/language areas (Bello-Bravo et al., 2011). Sound tracks using local languages can easily be attached to animation messages at low cost.

At present, published literature includes many studies reporting on experiments with these new approaches. However, as Duncombe (2015) noted in his comprehensive review, most of the time research focuses on effectiveness of only one innovation rather than systematically comparing different approaches.

**Purpose and Objectives**

The current study is a field experiment that compares an extension-only approach with either an animation-only approach or a combination of extension and animation together. Specifically, the current study:

- Provides a rigorous experiment to test and compare effectiveness of two alternative delivery methods or a combination of the two;
- Utilizes animation delivered through smartphones as a new method of communication in Mozambique, which takes advantage of the diffusion of smartphones in rural areas;
- Evaluates the ability of animation to effectively reach illiterate farmers, and particularly women, who sometimes are not invited or able to attend extension meetings.

**Methods**

The study was a field experiment, with a pre-/post-test design. A total of 314 bean-growing farmers from two different administrative posts in Gúrue district, Zambezia Province, Mozambique, participated. Farmers were assigned randomly by groups to one of three experimental treatments: (1) message via extension demonstration only; (2) message via smartphone animation only; (3) messages by both extension demonstration and animation. The topic of the experiment was use of a sealed container (jerry can) to safely store beans after harvest. Previous interviews had shown that farmers suffered serious bean losses due to weevil infestations after harvest, and that few farmers knew that storing beans in air-tight containers could avoid losses. The animation was created by Scientific Animations Without Borders (SAWBO) at the University of Illinois, which produces animations globally and works with local organizations to translate them into local languages.

Prior to the experiment, all farmers completed a pre-test assessing their knowledge of the topic plus demographic variables (age, education, gender, etc.). The farmers then participated in one of the three treatments. Following the experiment, all farmers completed a post-test that included assessment of their knowledge and intent to adopt this technique. The field work was carried out in July 2015.

**Results**

Results indicated that the three experimental treatment groups did not differ significantly from each other in knowledge about the jerry can storage method prior to the experiment. Women knew significantly less than men prior to the experiment. After treatment, all three experimental groups increased their knowledge of the storage method significantly, but the
extension only treatment showed the least learning. Comparison of post-test scores indicated that the animation only and the animation plus extension treatment showed significantly higher learning than the extension only treatment. Women closed their gap in knowledge. Their knowledge of the jerry can method was still slightly less than men after the treatment, but not significantly less. However, women who received the animation only treatment had significantly higher scores than women who received the extension only treatment, suggesting that animation was more effective for women. For men, there was no difference in learning between the extension only treatment and the animation only treatment. Finally, 98% of farmers said that they intend to use this technique in the future.

Recommendations and Implications

Results suggest that the use of agricultural messages designed as animations and delivered via smartphones results in at least as much learning as receiving the same information via a traditional extension presentation. Women, who knew less about the recommended bean storage method prior to the training, learned even more from the animations than men did, suggesting that animations may be effective in overcoming gender barriers to agricultural learning. Several limitations must be considered: (1) Farmers had never seen agricultural animations before, and there may have been a “novelty effect” causing them to learn more because it was new; (2) Farmers were shown the animations in small groups of 4-5, and this group interaction may have had an effect on learning that would not occur if they were by themselves or not in a training situation.

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Value Chain Analysis of Constraints and Quality of Gari among the Key Actors in Nigeria.  
The Case of Cassava Value Chain at Iwo, Osun State, Nigeria

Festus Annor-Frempong  
Department of Agricultural Economics and Extension  
School of Agriculture  
University of Cape Coast, Ghana  
Tel: +233244741679  
Email: papaannor@yahoo.com;  

Mercy Akeredolu  
Sasakawa Fund for Extension Education  
Abuja, Nigeria  
Tel: +2347030577768  
amakeredolu@winrock.org  

Assa Kante  
SAFE Coordinator, Mali & Burkina Faso  
Bamako Mali  

Adeniji, Adenike Risikat  
University of Ilorin, Ilorin Nigeria  

Keywords: Cassava Value Chain, Analysis of Constraints, Quality of Gari

Introduction

Cassava is a major crop in Nigeria and very important food in the diet of many people. A lot of efforts are being made to ensure successful production of cassava and no wonder Nigeria is has consistently been ranked as the world’s largest producer of cassava since 2005. The average output is over 35 million tonnes per year. However, a major problem affecting cassava production is high postharvest losses prompting the Federal Government of Nigeria to invest in processing of cassava into many food products. Cassava is processed into Gari as one of the best measures for reducing poor harvest losses.

Gari is creamy-white, granular flour with a slightly fermented flavour and sour taste. It is made from fermented, gelatinized fresh cassava tubers. Gari is processed through peeling, washing, and grating of fresh cassava root tubers. The product is then fermented, pressed and sieved before frying, drying and packaging for sale.

Iwo, a traditional town in Osun State of Nigeria with the indigenes mainly of Yoruba is noted for production of Gari. A lot concern is being raised about the quality and quantity of Gari available in the market for consumption. The Gari actors such as processors, marketers and consumers are usually faced with different constraints and no study that has been conducted to identify the constraints holistically. Value Chain Analysis is a tool for working out the greatest possible value for customers and maximizing profit for producers of a commodity but had not been used in the study area.
Purpose and Objectives

The primary purposes of this paper was to share results on application of value chain analysis to identify constraints in processing, marketing and consumption of Gari, an important cassava food product in Nigeria. The specific objectives were to examine the perception of actors of the quality of gari in the market and to identify the problems of processing, marketing and consumption from the main actors in the Gari value chain.

Methods and/or Data Sources; or Theoretical/Philosophical themes

Value chain mapping and analysis tool were used to work out the greatest possible value for customers and maximizing profit for producers of a Gari through the holistic identification of constraints. Questionnaires and interview schedules were used to collect data from respondents. The population for the study consisted of Gari processors, marketers and consumers. The sampling of respondents began with selection of five major compounds/households known for Gari processing at Iwo. In each compound, 10 processors were randomly selected to constitute the 50 gari processors sample size. A snow ball sampling was used to obtain the sample of marketers and consumers. Each processor selected linked the researchers to a marketer who purchases the Gari from processors. Twenty five common marketers were identified. The marketers were visited and two consumers each per marketer who were willing to participate in the study were interviewed. Therefore a sample size of 50 processors, 25 marketers and 50 consumers were used for the study. Statistics such as frequency counts, percentages, mean, standard deviation, cumulative percentage and ANOVA were used to analyse the data.

Results, Products, and/or Conclusions

The study results show that Gari processors and Gari marketers were females and married. There were all types of Gari consumers who were generally highly educated than processors and marketers. The processors were highly experienced and involved in trading as well while some of marketers are processors.

The processors varied in their opinion but somewhat perceived some constraints to processing of Gari at Iwo. However, marketers and consumers perceived the constraints to be major. The constraints identified included training opportunities, peeling of Gari, cost of processing technology, inadequate marketing centres for sale of Gari, knowledge to implement improved processing technology, cost of labour input and problems of transportation to marketing centres. The consumers perceived Gari to be contaminated, dirty, poorly processed, bad taste and poor in colour, scarcity and high price as constraints to consumption of Gari. The ANOVA results concluded that there were significant differences among the key actors (processors, marketers and the consumers) in the quality of Gari processed at Iwo.

Recommendations, Educational Importance, Implications, and/or Application

The study recommends among others that the Local Government through the Extension Department provides education and training to solve the numerous constraints identified in the Gari value chain. The processors and extension agents should provide the information on differences in quality of Gari expressed by marketers and consumers to processors to meet the preferences of consumers. The Local Government needs to work with processors, marketers and consumers to standardize Gari supplied to the market.
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Introduction

Overall, the number of U.S. students studying abroad has doubled since 1999 (Institute of International Education, 2014) but the same increase has not occurred in college of agriculture student populations. In an attempt to understand this phenomenon study abroad research in agricultural university contexts has focused on student motivations, attitudes, beliefs, perceived barriers, and assessment of student experience (Zhai & Scheer, 2002; Irani, Place, & Friedel, 2006; Briers, Shinn, & Nguyen, 2010; Danjean, Bunch, & Blackburn, 2015; Moore, Ferguson, & Wingenbach, 2015). The student-choice construct has been emphasized in sociology research to identify factors that affect student’s decisions about educational opportunities. Socioeconomic backgrounds and cultural capital, which includes cultural knowledge, educational credentials, and language skills all derived from parents’ class status, often explain student educational choices (Salisbury, Umbach, Paulsen, & Pascarella, 2009). Cultural capital also assumes parents invest time, money, and effort to reinforce the value of the college experience (Wolf, Sax, & Harper, 2009). Estes, Hansen, and Edgar (2015) findings supported previous research that parents are the most important influencer in the decision to study abroad however very little empirical research directly measuring parent perceptions of study abroad programs exists. Therefore, it is necessary to understand parents’ perception of study abroad to understand their influence on student decisions.
Purpose and Objectives
The purpose of this study was to identify parent opinions about student study abroad programmatic components (i.e. length of experience, time of year, student classification, cost). Three research objectives were developed to guide the study: 1) Identify preferred study abroad components (i.e. length of experience, time of year, student classification, cost), 2) describe parent perception of the importance of a study abroad and 3) determine likelihood of parents to support study abroad participation.

Methods
Descriptive survey methods were used to complete this census study. The target population (N=1,511) was comprised of parents, which included legal guardians, of registered student participants in colleges of agriculture summer new student conferences at three southern U.S. universities. A response rate of 57% (n=868) was achieved. The researcher-designed questionnaire was developed as part of a larger study based on Ajzen’s Theory of Planned Behavior (2013). The variables importance of participating in a study abroad and likelihood to support a study abroad were measured with a 4-point Likert scale. For analysis, these responses were artificially dichotomized into two groups: important/unimportant and likely to support/unlikely to support.

Results and Conclusions
Objective one described the parent preferred programmatic components of a study abroad. Respondents indicated that the junior year classification (58%) was the most suitable academic level and summer term (59%) was the most desirable time of year for participating in a study abroad. Respondents also identified 4-6 weeks (47%) as the most appropriate length of time for a student to participate in a study abroad. Cost of a study abroad program, including airfare, meals, lodging, and activities but not including tuition, ranged from $2,000- $4,000 (50%).

Objectives two and three described parents’ opinions about the importance of studying abroad and likelihood to support their student’s participation. A majority (58%) indicated that studying abroad was important to their student’s academic experience. Most parents (76%) reported they were likely to support their student studying abroad.

Recommendations
Parent opinions about study abroad programmatic components are consistent with previously reported student preferences of short-term, summer experiences in their junior year of college (Institute of International Education, 2014; Estes, et al., 2015). Continuing to develop experiences that meet these expectations has the potential to maximize student interest and participation. The results of this study indicate that parents do believe study abroad is important to their students’ academic experience. Overwhelmingly, parents are likely to support their students’ participation in a study abroad program. However, it should be noted that parent preferences regarding length of study abroad and cost are incongruent. Since finances (Irani, Place, & Friedel, 2006; Briers, Shinn, & Nguyen, 2010) and socioeconomic status (Salisbury, et al., 2010) are among the most commonly cited barriers to study abroad participation, this incongruence needs to be addressed through additional education and marketing strategies.

Since parents have been identified as influencers in the decision to study abroad (Salisbury, et al., 2010; Estes, et al., 2015) and they identify the importance of study abroad and
a willingness to support their students, program leaders should view parents as a resource to engage students in study abroad participation. Additional research is needed to further understand parent perceptions, characteristics, and beliefs that may influence student decisions about studying abroad.

References


Willingness to Enroll into University Agricultural Extension Training Programme by Mid-Career Female Agriculture Workers in Kwara and Niger States, Nigeria

Ogunlade, I.
Department of Agricultural Extension and Rural Development, Faculty Agriculture, University of Ilorin, Nigeria

Akeredolu, M. Kante, A
West Africa SAFE Coordinator, Nigeria.

Owoeye, B.
Department of Agricultural Extension and Rural Development, Faculty Agriculture, University of Ilorin, Nigeria

Introduction

In Nigeria, Sasakawa 2000 has supported the generation of technology and innovations in Agriculture to boost production and increase farmers income. Unfortunately, the research results have not been adequately transferred to the farmers due to the low level of technical education by agricultural extension agents. The Collaborative efforts between University of Ilorin and Sasakawa Africa Fund for Extension Education to upscale the Knowledge of mid-career Agricultural Workers through B.Sc. degree in Agricultural Extension and community development has been on for the past four years. The applicants for this programme have been on the low side especially the female folk. Female mostly, are the ones that don’t get enrolled in school, this is because of socio-cultural reasons and this is due to Gender inequality and discrimination which is the bases of a social system in which the male gender is the head and has authority over the woman. According to Cusack (1999), large factors constitute the oppression and status of women which originated in the family and in the society. Cusack revealed that the society, tradition and religion supports male’s dominion and it has created some beliefs which has evolved into reasons why things are the way it is. Ogundipe-Leslie (1991, P.25) defined culture as a way of life and people’s belief which was as a result of their relationship with others. Kolawole (1998), defined gender inequality in African as a product of misconception of culture which has resorted into having women to have less or no value. She argued that culture is used as a tool to oppress the female world.

Purpose and objectives

The study determines willingness to enroll into University Agricultural Extension training by mid-career female Agricultural workers in Kwara and Niger State. Specifically it;

1. Describes the socio-economic characteristics of the mid-career female Agricultural workers in the study.
2. Determines the willingness to enroll in University Agricultural training by mid-career female Agricultural workers.
3. Investigates the factors inhibiting mid-career female Agriculture workers’ enrolment in University Agricultural extension training.
4. Examine the factors promoting mid-career female Agricultural workers’ enrolment in the University Agricultural Extension training in the study.

**Methodology**

This study was carried out using structured questionnaire to obtain data from a total of 140 mid-career female Agriculture workers who were purposively selected based on their employment with the Agricultural Development Agency or the Local Government commission in their respective States. Descriptive statistics such as Frequency counts, percentage, mean and ranking, chi-square and Logistic regression were used.

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

The findings show that, mid-career female Agricultural workers had the mean age of 42 years. Most of them are married (95.7%) with 8-7 mean working experience and mean income of #38,000. 60% of respondents are willing to enroll for University Agricultural Extension trainings while 40% were not willing. This corroborates the work of Laura (2007) who posited that student participated willingly based on the benefit of the programme. Factors inhibiting mid-career female Agricultural workers’ enrolment which were presented to the respondents included: Financial Problem (\( \bar{x} =2.51 \)), Academic Stress (\( \bar{x} =2.16 \)), Family commitment (\( \bar{x} =2.30 \)), Transportation (\( \bar{x} =2.00 \)), Insufficient awareness (\( \bar{x} =2.15 \)), Suitable time-table (\( \bar{x} =2.13 \)), imbalance family work with programme (\( \bar{x} =2.00 \)), Lack of coordination of women in programme (\( \bar{x} =1.72 \)) and lack of recognition of female participants (\( \bar{x} =1.64 \)). Thirteen (13) factors promoting enrolment into University Agricultural trainings were: promotion to highest level in chosen career (\( \bar{x} =3.44 \)), Recognition attached programme (\( \bar{x} =3.24 \)), Self-interest (\( \bar{x} =3.20 \)), Bridge Gap between HND and B.Sc (\( \bar{x} =3.19 \)), Organizational demand (\( \bar{x} =3.10 \)), Husband’s Interest (\( \bar{x} =2.86 \)), Career development and friend’s motivation (\( \bar{x} =2.79 \)), Lack of access to career opportunities (\( \bar{x} =2.75 \)), Lack of job(\( \bar{x} =2.67 \)) and un-conduciveness of present career (\( \bar{x} =2.58 \)).

Chi square analysis result shows that a significant relationship existed between all the selected socioeconomic characteristic of mid-career female Agricultural Workers and their willingness to enrol in the study area. Age (\( \chi^2=96.857, p< 0.000 \)), marital status (\( \chi^2=59.586, p< 0.000 \)), household size (\( \chi^2=92.829, p< 0.000 \)), Work Experience (\( \chi^2=58.457, p<0.000 \)) and Income per month (\( \chi^2=31.257, p<0.000 \)). And Multinomial logistic the regression analysis reveals that significant relationship exist between transportation, lack of recognition attached to the female participant by the employer, Imbalance family work with the Programme and Insufficient awareness of the Programme are significant at 5% level of confident and willingness of respondent to be enrolled into the university training programme.

**Recommendations & application**

This study recommends that mid-career female Agriculture Workers should be encouraged to join a registered cooperative society to build up savings for the Programme, SAFE Co-ordinators, should sensitize Federal colleges of Agriculture for their graduates to enrol in the Programme and considers alternate mode of delivery.
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