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Women and Food Security: Preserving Women’s Agency and Wellbeing
A Case Study of Peer-to-Peer Engagement to Address Agricultural and Food Security Development in Sub-Saharan Africa: Perspectives of an American Student Participant

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Introduction

The importance and potential for peer-to-peer interaction cannot be over-stated in the realm of international development. Evidence in the literature reveals that student-to-student interaction can powerfully influence perceptions (Boud, Cohen, & Sampson, 2001) and homophily amongst interacting parties greatly facilitates positive interaction, trust, sharing, knowledge exchange, attitude and behavioral change, and ultimate reward for participants (Miller & Shinn 2012; Rogers, 2003). Further, the building of “positive relationships” can allow the establishment of a network to extend education related to development (Malima, Blomquist, Olson, & Schmitt, 2014, p. 31).

As shared by Tobin, Bruening, Brennan, and Olson (2012), including farmers in the planning process is critical to success in development efforts, and according to Moriba, Kandeh, and Edwards (2011) empowering farmers to be self-reliant is critical. Peer-to-peer engagement can address these necessities. Thus, there is a need to document successful peer-to-peer engagement in international development and share experiences and effective practices.

Purpose and Methods

The purpose of this case study was to document an internship experience built upon a peer-to-peer approach in international development in Sub-Saharan Africa from the perspective of an American participant. The rich description of the case study is a first-hand account of the process of participation and the outcomes of the experience with the program. The phenomenon under investigation was the experience from the perspective of the American participant and is bounded as such (Merriam, 1998).

Results

The internship program offered by Washington State University involved five undergraduate students who were partnered with three Rwandan students from the Rwandan Higher Institute of Agriculture and Animal Husbandry (ISAE), to design agricultural innovations that would meet needs defined by the community in Gashora as having potential for positive
impact on food security and economic success of Rwandan farmers. It was unique for American and Rwandan peers, very similar in age and academic standing, to be counterparts for the entirety of the internship. The program encouraged students from the United States to work side-by-side as peers with the students from Rwanda, both at a distance and on the ground in Rwanda, over a four month time period. These students collaboratively addressed needs specified by the community and gained an unparalleled opportunity to actively engage with the people of Rwanda.

Issues identified within the community included sanitation, composting, food preservation, and mushroom cultivation. During the internship, multiple projects were executed on-site in Gashora to address these issues. Collaboration among both US and Rwandan students, along with the help of a Rwandan builder and his crew, enabled the projects to be successfully completed.

Specific projects included the design and construction of a passive-air solar food dehydrator, eco-latrine, mushroom house, pile composts and worm bin. Each of these projects were designed using the expertise of the interns and provided American students with hands-on experience, while improving Rwandan lives and building lasting relationships among the peers.

Outcomes of the internship experience were broad. The majority of those involved in the program have continued work and education in international development. Impact on the primary author will be life-long. A prototype dehydrator is still used by the Washington State University Organic Farm and the Rwandan dehydrator currently dehydrates oyster mushrooms in Gashora. One of the Rwandan student participants is now working on a Master Degree at Washington State University in the United States, while two Rwandan participants work in Rwanda with similar visiting groups and regularly win writing and idea competitions. Three of the five American students either work in, or are actively pursuing education in international development and cite this program as a cornerstone in their professional development. An unexpected positive outcome supports the statement made by Miller and Shinn (2012), that “Infrastructure development creates rural employment” (p. 8). The Rwandan builder, who was instrumental in procurement of Rwandan tools and building materials, and greatly helpful in assisting construction in Gashora, has since become a local resource for agricultural innovation, hired to do similar work with other development groups. The full presentation shares the internship process, interactions with the Rwandan community, and the long-lasting impact of the experience on the primary author.

Implications and Recommendations

Involving peers (i.e., age, education, field of study, and relative socio-economic status) in the internship program is believed to be what facilitated the high impact and success of this program. It is critical to emphasize that need for the innovations was defined by the members of the Rwandan work-site as having potential for positive impact on the community and were indicative of food security and economic issues faced by farmers around the world. Sharing the experience as a result of this model on international development engagement has the potential to greatly increase positive outcomes of similar programs.

References


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A Case Study of Students’ Perceptions of Food Security and Diets: United States vs. Guatemala

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Introduction

Each year, more U.S. students study abroad, resulting in a record high 283,332 students studying abroad for academic credit in 2011-12 (Institute of International Education, 2013). The number of students studying abroad has been one of the primary metrics used to document the success of study abroad programs for decades (Vande Berg, Paige, & Lou, 2012). While it has been noted that “study abroad programs are rich with possibilities for meaningful transformative learning” (Passarelli & Kolb, 2012, p. 137), research offers conflicting evidence about what and how students learn (Vande Berg et al., 2012). Passarelli and Kolb (2012) argued, “attention must be paid to designing learning experiences that helps students fully absorb and integrate their experiences at increasing levels of complexity” (p. 138).

Texas A&M University emphasizes the need for implementing meaningful learning experiences while students are studying abroad. One such experiential learning activity requires students to compare and contrast food security in the U.S. as well as the country where they are studying abroad.

Food security exists when people “have all-time access to sufficient, safe, nutritious food to maintain a healthy and active life” (World Food Programme, 2014). Food security is a complex problem based on three elements: food availability, food access, and food utilization. Food availability requires the availability of sufficient quantities of food on a consistent basis, and food access refers to whether people are “able to regularly acquire adequate quantities of food, through purchase, home production, barter, gifts, borrowing or food aid” (World Food Programme, 2014). Food utilization means that “consumed food must have a positive nutritional impact on people” (World Food Programme, 2014).

Purpose
The purpose of this study was to explore students’ perceptions of the impact of food security on their mental and physical activities both in the United States and Guatemala. Food security, while of concern in the United States, is “of grave concern” in Guatemala (USAID, 2014, para. 3). Guatemala has one of the highest malnutrition rates in the world with nearly one-half of children under five being chronically malnourished (Our neighbors, ourselves, 2011). Malnutrition in Guatemala has been attributed to a food access issue, particularly “that families lack resources to produce or buy nutritious food” (USAID, Situation Analysis section, para. 3).

**Methods**

A case study approach was used to fulfill the purpose of this study. “The purpose of a case report is not to represent the world, but to represent the case” (Stake, 2005, p. 460). Student participants (N = 10) in a Texas A&M University study abroad program in Guatemala constituted the case study. Participants recorded their dietary intake (i.e., breakfast, lunch, dinner, snacks, and drinks) for one week in the U.S. prior to the study abroad program. Following the second week of in-country activities, participants again recorded their daily dietary intake; they also reported daily physical activities and assessed their physical and mental states of being through journaling. Data were collected during spring 2014 while participants were in one rural, impoverished community. Following a final in-country peer debriefing session about dietary conditions in the U.S. and Guatemala, all data were independently analyzed using the constant comparative method (Glaser & Strauss, 1967).

**Results**

Students’ food journals, before and during their stay in Guatemala revealed several themes, including dietary variety (U.S.) and physical limitations (Guatemala). In the U.S., students consumed a variety of foods, rarely eating the same thing twice in one day. However, in Guatemala, their diets consisted of similar foods, mostly vegetable-based (tortillas) and minimal proteins (eggs, chicken).

A lack of variety led to lacking nutrients needed to sustain physical and mental energy. Participants reported feeling “sluggish, tired, or exhausted” in their daily physical state; instructor’s observations were that students were mentally exhausted following daily activities (i.e., gardening, hiking, etc.), which severely limited their intellectual participation during evening educational/cultural sessions.

**Recommendations/Implications**

As a result of experiencing challenges related to food access and food utilization in Guatemala, students had a deeper understanding of food security issues, both domestic and abroad. This experiential learning activity provided a transformative learning experience that complemented their study abroad program.

This study accounted for one case occurring during a study abroad program with one group of students. Additional in-depth study of dietary changes affecting students’ participation levels during study abroad programs is recommended. The results of such study can help program coordinators better prepare students for international experiences involving lack of daily dietary choices, coupled with physical exertion.

**References**


A Look at Students’ Perceptions, Interests, and Behaviors Related to Sustainability

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Introduction

With the Earth’s finite resources dwindling each day, and ecosystems increasingly disappearing, post-secondary institutions are being looked to as role models and progress starters for a more sustainable environment (McNamara, 2008). In an effort to foster global sustainability, higher education institutions are posed with two questions: What can higher education do for sustainable development (Corcoran & Wals, 2004), and what can sustainable development do for higher education (Gough & Scott, 2008). Universities can help foster sustainable growth globally in a number of different ways. Focus at the university level could simply be increasing campus sustainability efforts and reducing the ecological footprint (Beringer & Adombent, 2008). Current trends on campuses are to implement drives to promote sustainability and educate students about certain sustainability issues and information.

Purpose and Objectives

The purpose of this study was to assess new and current students’ perceptions and awareness of the Office for Sustainability and other sustainability efforts at the University of Arkansas. Three guiding objectives included:

1. Describe and compare University of Arkansas students’ perceptions of sustainability factors.
2. Describe and compare students’ responses to selected sustainability scenarios;
3. Determine the relationships between new and returning students’ perceptions of sustainability factors and their responses to selected sustainability scenarios.

Methods

The population for this study consisted of all new (N = 5,764) and returning (N = 15,245) undergraduate students enrolled at the University of Arkansas during the fall 2013 semester. New students were defined as undergraduates enrolled in courses for the first time at University of Arkansas during the fall 2013 semester (freshman and new transfer
students); returning students were defined as undergraduates having already completed one or more semesters at the university.

The new and returning student instruments were developed by the researchers based on input from the University of Arkansas Office for Sustainability and on previous research (ULSF, 2009; Colorado Mountain College, 2009). Likert-type questions were based on a five point scale with 1=very low and 5=very high. Instrument coefficients of stability (r) for sections one, two, and three of the instruments were .85, .73, and .95, respectively.

Data were analyzed using descriptive (means, standard deviations and percentages), correlational, and inferential (t tests, chi square tests) statistics. Exploratory factor analysis was also used to identify the number and nature of underlying factors responsible for covariance in the 15 items designed to measure perceptions and awareness of sustainability; the identified factors were used as dependent variables in subsequent analyses. An alpha level of .05 was selected a priori for all tests of statistical significance.

Findings, Conclusions, and Recommendations

New and returning students responded to 15 items about sustainability. The highest level of concern about the future of natural resources (M = 3.72 and 3.87, respectively). Awareness of sustainability classes offered at the University of Arkansas was the lowest rated item for both new and returning students (M = 2.02 and 2.07, respectively). In general, both new and returning students rated items related to personal sustainability interests and concerns higher (“uncertain” to “high”) than items related to awareness of and interest in university sustainability programs or careers in sustainability (“low” to “uncertain”).

Students were presented with four sustainability scenarios and asked to indicate their most typical behavior in each situation. Both new and returning students were most likely to select the sustainable alternative of turning off the lights when leaving their room (94.1% and 96.5%, respectively), recycling or reusing an empty water bottle (80.6% and 80.5%, respectively), and turning off their room air conditioner or heater when leaving for vacation (74.5% and 78.5%, respectively).

New and returning students placed a moderately high importance on sustainability, but their awareness of and interest in campus sustainability programs and courses and sustainability careers was low. Students most preferred to learn about campus sustainability efforts through email and social media. Majorities of both new and returning students indicated they would practice the sustainable behavior in four typical campus sustainability scenarios; significantly (p < .05) higher percentages of returning students selected the sustainable behavior for two scenarios. There was no significant difference between new and returning students on Sustainability Self-Concept; both groups were uncertain to moderately positive. As expected, returning students scored significantly (p = .03) higher on Sustainability Program Awareness; however, the effect size was very small (Cohen’s d = 0.09). Sustainability Self-Concept had significant (p < .05) low to moderate positive correlations with selection of the sustainable behavior for each of the four sustainability scenarios. The Office of Sustainability should increase targeted communications and educational efforts about campus sustainability initiatives, academic programs, and careers, something that may prove valuable at all post-secondary institutions as they seek to become role models and progress starters for a more sustainable environment (McNamara, 2008). Understanding how to more effectively educate students
about sustainability is a global concern. This research should be used to inform practice at a global level.

References


A Needs Assessment of Arkansas Agricultural County Extension Agents: A Focus on Nematology In-service Training

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Introduction

Land-grant universities, state agricultural experiment stations, and the Cooperative Extension Service (CES) serve the purpose of producing and diffusing agricultural information to the public (Cash, 2001). In the CES, county agents serve as “educator and advisor” to the community by “transferring the findings of research and new technology” (Seevers & Graham, 2012, p. 254). This is true for extension educators throughout the globe, especially those focused on agricultural production (Malima, Blomquist, Olson, & Schmitt, 2014).

In the U.S., Extension employees attend in-service trainings to receive instruction in their respective subject-matter areas (Seevers & Graham, 2012). CES also provides assistance to producers so they can “earn a fair return on their efforts in an environmentally and socially responsible manner” (Seevers & Graham, 2012, p. 72). Plant-parasitic nematodes are one of the contributing pathogens to plant disease-related crop losses and was identified as a training area need. An estimated $8 billion in plant-parasitic nematode damages and losses occur in the United States every year (Barker et al., 1994; Barker, 1998; Jagdale, 2011). Those figures more than quadruple when looking at the global impact.

Due to the significant impacts of plant-parasitic nematodes, plant pathologists identified a need to expand the knowledge base in plant and soil nematology, as well as increase research, education, and outreach in nematology (Barker et al., 1994). The needs outlined by researchers in plant pathology and agricultural education, combined with the agricultural impacts in Arkansas and the world, led researchers to select nematology as the subject of investigation of this study.

Purpose and Objectives

The purpose of this study was to identify Arkansas agricultural county extension agents’ need for plant parasitic nematode in-service trainings, to identify respondents’ comfort level with technology as it pertains to their job and in-service training, and identify areas of need for nematology training. Six objectives guided the study: (1) determine comfort with technology; (2)
determine perceived utility of job related resources; (3) determine the frequency that consultation about topics pertaining to plant parasitic nematodes was needed; (4) determine level of need for plant parasitic nematode training; (5) determine sources for nematology information; and (6) determine preferred types of in-service training.

**Methods**

This study targeted Arkansas agricultural county extension agents \((N = 46)\) and extension staff chairs \((N = 73)\). Data for the study was collected with a researcher developed online survey instrument. Initial contact respondents \((n = 30)\) and those responding to the follow-up contacts \((n = 38)\) were compared, using t-tests, on their comfort with technology and need for training. A panel of agricultural and extension education faculty from University of Arkansas reviewed the instrument for face and content validity. Ex post facto reliability coefficients were calculated for the six constructs within the needs assessment. The constructs, and their coordinating Cronbach’s alpha coefficients were: comfort using technology (.89), perceived utility of job related resources (.552), job duties (.95), nematology education needs (.97), educational sources (.80), and in-service preferences (.70).

**Results**

Respondents reported being most comfortable utilizing a computer to search for job related information \((M = 4.43, SD = 0.77)\), and least comfortable using a Smartphone to search the Internet \((M = 3.65, SD = 1.15)\). The respondents’ most useful utility of job related resources \((M = 4.22, SD = 0.83)\) was the Arkansas Cooperative Extension website. The nematology training topic with the highest level of need was developing nematode management recommendation \((M = 3.33, SD = 1.04)\). However, submitting soil samples had the lowest level of need for training \((M = 2.87, SD = 1.16)\). The most preferred in-service training method was face-to-face in-service workshops with state faculty and specialists \((M = 4.09, SD = 0.86)\). Self-paced on-line training modules were identified as the least preferred in-service training method \((M = 2.63, SD = 1.16)\).

**Conclusions and Recommendations**

Needs previously identified by leading nematologists led researchers of this study to assess if nematology education was a topic within the Arkansas CES agricultural program area that warranted in-service training development. Furthermore, researchers assessed agents’ comfort level with technology within the scope of their job and in-service training needs. Respondents indicated a high level of comfort with job related technologies, such as Internet, computers, smartphones, and iPads/tablets. Of the respondents, 67% identified general knowledge of plant parasitic nematodes necessary to meet the needs of their clientele. Findings from the needs assessment indicate agents have a need for nematology training and resources.

Overall, agricultural county Extension agents need further training in nematology topics to better assist their clientele, and respondents’ self-assessed comfort and interest level with technology is sufficient to warrant development of online in-service training opportunities in the future. Lessons learned from this state-wide study can assist other states and countries struggling with educating agents and producers about nematology.

**References**


A Qualitative Program Review of the Center for Entrepreneurship Development and Vocational Studies, Federal Polytechnic, Ado-Ekiti, Nigeria

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Keywords: Academic program reviews, Post-secondary technical education, Tertiary education federal polytechnic

Introduction

Expertise-oriented evaluations predate all other types of formal, public evaluation. Fitzpatrick, Sanders, and Worthen (2011) state that “as its name implies, it relies primarily on professional expertise to judge the quality of a . . . program” (p. 127). This on-site review of Federal Polytechnic’s (FP’s) Center of Entrepreneurship Development and Vocational Studies (CEDVS) in Ado-Ekiti was conducted in 2014, was facilitated by Winrock International, and sponsored by the USAID Farmer-to-Farmer program. The primary author served as the expert-oriented evaluator and worked for almost three weeks in June 2014. The FP offers both a National Diploma (ND) and the Higher National Degree (HND) program, and CEDVS is the administrative home of the Entrepreneurship Education (EEd) program. In 2010, the EEd program was made mandatory for all academic majors at all public institutions by the Federal government. The CEDVS’s EEd program is designed as a series of theory and skill acquisition courses (e.g. aquaculture, snail production, apiculture, poultry and crop production).

The operational framework for this evaluative study is based upon work by Mets (1997) and Paloma and Banta (1999) (Figure 1). Met’s (1997) discusses both a recommended process for program reviews, as well as critical success factors, and potential outcomes. Paloma and Banta (1999) also discuss potential program outcomes.

Purpose

The purpose of this evaluative study was to utilize expertise-oriented evaluation to make a judgment on FP’s CEDVS in Ado-Ekiti, Ekiti State, Nigeria. The objective of the study was to conduct a program review of CEDVS. In terms of methods, the program review of the CEDVS was based upon data and information collected from the following sources: (1) personal and group interviews with stakeholders; (2) observations of FP institutional facilities and student home-based enterprises; and (3) review of official publications, and both curricular and institutional. As recommended by Fitzpatrick, Sanders, & Worthen (2011) protocols to judge the adequacy of the evaluation (accuracy,
utility, feasibility, propriety, and evaluation accountability) were adhered to during this study.

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**Figure 1.** Operational framework for successful program reviews (Met’s 1997; Paloma & Banta (1999))

**Results**

In terms of results, the theory and skills acquisition courses were found to be sound in concepts and principles, well developed, student-centered, and sequenced logically with one-another. Employability skills were embedded within the content. Many stakeholders praised the content and its application in the program. They perceived that students learn that rewards come subsequent to hard work and focus. They also perceived that the program teaches self-efficacy, self-assurance, and self-confidence. The business-related skills that the program taught students, such as recordkeeping and business management, were also highly valued. A great deal of variability was observed in available laboratory space and quality of laboratory equipment within the various skills acquisitions units. The CEDVS has initiated an eLearning initiative, and has transitioned all examinations to a computer based environment, making results immediately accessible to students.

In terms of conclusions, recommendations, and implications, an examination of the process revealed that formal program reviews and related best practices for conducting such reviews (Figure 1) are not routine in the FP system in Nigeria. Hence, the process for sponsored USAID reviews to enhance capacity would benefit from the establishment of a more formal and systematic review process. For example, at FP, a comprehensive and systematic strategic planning process which includes unit-level and program related goals, objectives, critical success factors, and annual indicators has not been established. In terms of the program review process, both Winrock International and FP representatives established a Scope of Work, complete with evaluation goals and objectives. However, prior to the on-site visit, there was no formal review council established, no pre-set agenda established for the visit, and no self-study conducted related to the project Scope of Work. This said, there was a sense of eagerness to learn and develop a more formalized the process for adoption and use in subsequent years.

The results of this study confirmed an independent assessment by a representative from the National Board for Technical Education (NBTE) conducted in 2013. The NBTE summary report stated that: “The Board should consider the EDC at Federal Polytechnic, Ado-Ekiti as one of the centers for excellence in Entrepreneurship Development Programme” (Kofarmata, 2013, p. 4). This said, it is important that stakeholders give new interventions like the CEDVS time to ‘work’ before substantial changes are made, and if changes are made, they should be evidence-driven. Opportunities abound for partnerships with industry, which could materialize from a recommended program advisory committee.
References
AgriCorps: Utilizing the Agricultural Education Model to Address Food Security

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Keywords: Food security, Youth development

Introduction
As the global population creeps toward a projected 9 billion people in 2050, concern mounts over the global food system’s ability to meet food demand (FAO, 2009). The youth population (aged 12-24) is projected to peak at 1.5 billion in 2035 (Bennell, 2007). The FAO estimates that in Sub Saharan Africa 70% of youth live in rural areas. However, increasingly more youth are migrating to urban areas in search of work and opportunity. It is widely believed that rural youth are becoming more disinterested in agriculture (Bennell, 2007). Additionally, “support for capacity development for youth in directly productive agricultural activities (especially skills training at all levels) still receives limited support” (Bennell, 2007). If rural youth are equipped with agricultural skills and become interested in agriculture as an industry, there is great potential for increasing food security in their communities (Bennell, 2007).

Purpose and Objectives
AgriCorps is a non-profit organization that was created to help address this identified need for food security. AgriCorps sends U.S. College of Agriculture graduates to the developing world to teach agriculture for 11 months. AgriCorps utilizes experiential learning techniques to teach critical thinking in agriculture to young people. Just as young people in the United States introduced new agriculture technology (seeds, tools, organic/inorganic fertilizer, conservation methods) through Extension and Vocational Agriculture to their parents at the beginning of the twentieth century, so, too, can young people be the conduit to transfer new agricultural technologies to their families in the developing world (NIFA, 2014).

Theoretical/Philosophical Themes
Through experiential learning, young people will develop entrepreneurial skills, agricultural knowledge, and leadership abilities that empower them to pursue agriculture as a means to improve their lives, their households and their communities. Experiential learning is a truly foreign concept in most developing countries. The education system in many African countries is so classroom-focused that students of agriculture never go onto a farm or garden for learning purposes. In their current paradigm, the school garden is for labor and the classroom is for learning. It will take a significant shift to get students (and their teachers) to see the school garden as a laboratory for learning, and to encourage them
to think critically and ask questions. The behavioral shifts will not end at the schoolhouse
door. Students will take their entrepreneurial agricultural projects home as demonstrations
of new technology to their parents. Witnessing the success of the student's home project,
the family may take the next step to shift their own farming practices to experience the
benefit of the new technology.

AgriCorps does not intend to overlay Western-style agriculture on a
developing country and expect successful outcomes. Rather, AgriCorps trusts that the
democracy of ideas and innovation that comes through the awareness of critical thinking
will open possibilities to new agriculture technologies based on local customs, resources
and ecosystems. Through these technologies, yields will increase, poverty will be reduced,
and human lives will improve. By sending volunteers into developing countries and
partnering with existing programs, AgriCorps will continue the legacy of agricultural
education created in the United States over a century ago.

Results and Conclusions
AgriCorps deployed its first group of volunteers to Ghana in August 2014. The
seven corps members are living and working in rural villages, teaching agriculture,
strengthening existing 4H programs and creating new ones, and building demonstration
farms on school campuses. AgriCorps is partnering with the National 4-H Council and the
Global Clover Network to extend volunteers where 4-H programs currently exist. Using
the Agricultural Education Model to teach new technologies to rural youth may change
their perceptions regarding agriculture as an industry and contribute to the food security of
their families and communities.

Recommendations/Impact on the Profession
AgriCorps is an international agricultural education organization, and education is
never an end, in-and-of itself. It is always a means to a better end. With that in mind,
AgriCorps has two primary and three secondary success indicators. The primary success
indicators are: technology and methodology adoption by farming households and improved
yields for farming households. These two indicators are the focus of the AgriCorps mission
but can only be measured over time. The three secondary success indicators that are
necessary to accomplish the primary indicators are: 4H Club development, school garden
development, and home entrepreneurship projects development. Metrics need to be
developed and research needs to be conducted to measure the efficacy of the work being
done as defined by these success indicators.

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Agricultural Extension Officers’ Knowledge of Food Security Issues in Trinidad: Implications for Professional Development

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Introduction

Food insecurity and undernourishment are global issues that plague hundreds of millions of individuals daily. In 2012-2013, 842 million were said to be suffering from chronic hunger (FAO, IFAD & WFP, 2013). Caribbean countries, such as Trinidad and Tobago are not exempt from this struggle, with about 17 percent of the population below the poverty line (CIA, 2007). In addition, agricultural production for the country has been significantly low. Only 8 percent of the required staple foods are grown in country (CIA, 2012). Food security, therefore, has been a topic of discussion for the government, including the development of a National Food Production Plan 2012-2015 (Ministry of Food Production, Land, and Marine Affairs, 2012). Although enhancing food security is a crucial task for the country’s future development, very little is known about frontline individuals that must implement the plan. Previous research has explored producer knowledge (authors, in press).

Purpose

This research was conducted to explore extension officer knowledge related to food security. Results have implications for professional development programming. The objectives were: (a) identify the food security issues in greatest need for additional training and (b) explore how needs may vary based on selected variables.

Methodology

There are 132 extension officers in Trinidad. Data were collected face-to-face from 63 of the officers during January to March 2014. The survey used consisted of two parts: (a) personal demographic and professional experience questions and (b) indicators of knowledge and importance of 27 food security issues derived from The National Food Production Action Plan 2012-2015 (Ministry of Food Production, Land and Marine Affairs, 2012). Using procedures proposed by Borich (1980), the 27 issues prompted the
farmers to indicate (a) their current level of knowledge of the issue and (b) the importance they attached to the issue. This process allows the researcher to prioritize the training needs of the farmers by considering both the knowledge and importance of the issue to calculate a Mean Weighted Discrepancy Score (MWDS). The most important items with the least level of knowledge would have the highest priority. The responses for the level of knowledge used a Likert scale ranging from 1 = no knowledge to 5 = extremely knowledgeable. The responses for the level of importance used a similar scale ranging from 1 = not important to 5 = extremely important.

Results

Overall, the five food security topics with the greatest need for additional training were: (a) a place to store up-to-date and accurate data and statistics for the agricultural sector (MWDS = 4.62), (b) research and development for both livestock and crop farmers (MWDS = 4.14), (c) national-level legislation that addresses production, land use, health, safety, human resources, and trade (MWDS = 3.84), (d) national-level policies for production, land use, health, safety, human resources, and trade (MWDS = 3.79), and (e) water management and flood control systems such as on-farm ponds, irrigation systems, and rainwater harvesting systems (MWDS = 3.21). Differences in selected food security issues were noted based on: (a) education level, (b) the amount of time they intended to stay in extension, (c) if they had received previous training on food security, and (d) their prevalence of paying attention to global issues. No differences were noted for: (a) extension region, (b) gender, (c) if they currently operate a farm, (d) if they grew up on a farm, or (e) their length of service in extension. It is noteworthy that the top four issues based on overall MWDS did not vary by any of the selected variables indicating universal need for professional development.

Conclusions, Recommendations, and Implications

Results revealed positive MWDS scores for 26 of the 27 food security issues, thus highlighting a need for professional development in this area. The five issues presented above had the most pressing needs and professional development programming should be developed and delivered. Of those five, research and development for both livestock and crop farmers may be the most pressing need. Previous research (authors in review) identified this issue as a top need for agricultural producers and the current research indicated the same need for extension officers. It is recommended that the Ministry of Food Production, Land, and Marine Affairs partner with the agricultural universities to immediately address this need. The findings of this research also have implications for educational institutions that produce graduates that work in extension in Trinidad.

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An Analysis of International Internship Experiences of Recent Graduates of the Oklahoma State University Master of International Agriculture Program (MIAP)

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Keywords: International agriculture, Internship, Study abroad, Career impact

Introduction

The Master of International Agriculture Program (MIAP), in its sixth year of operation, has grown to become one of the largest graduate degree programs. MIAP is a multidisciplinary program within the College of Agricultural Sciences and Natural Resources (CASNR) and MIAP students come from various academic disciplines and backgrounds. Furthermore, MIAP is part of the Master International Peace Corps and also offers dual degrees with two universities in Mexico. Focus areas in MIAP include agricultural sustainability, agricultural development, and agritourism, among others. Every American student is required to complete an international experience of four weeks minimum. A majority of MIAP Students report having had life-changing impacts during their international experiences.

Students view internships as something that would influence their career prospects, increase their likelihood to seek international volunteer work; it is associated with better foreign language skills, inter-cultural competence, international awareness, and are also associated with increase in self-confidence (Norris & Gillespie, 2009). Students expand or change their majors, and some return from internships motivated to do further graduate level study. These issues have implications for how we prepare our students for their international experiences.

Conceptual/Theoretical Frame

Mezirow’s (1991) theory of transformational learning is used to understand the students’ sense of the impact(s) their experiences had on them. Experiential learning enables students to acquire advanced perspectives, “a new awareness of social and cultural power” (Malinen, 2003). An individual’s overall world-view is generated out of smaller experiential components to make a meaningful perspective (Clark, 1993; Mezirow, 1981). Mezirow (1991) emphasized the premium role of critical reflection which MIAP students do when they write the internship reports; experience – which is a big part of MIAP
students’ travel abroad; and, *rational discourse* – which students engage in when discussing content related to areas of focus.

**Purpose/Objectives**

The purpose of this study was to investigate the characteristics which influence choice of international experiences and perceived meaningfulness of their subsequent impacts on students. Three objectives guided the study: 1) describe the associations between students’ personal/academic characteristics and their choices of internship destination; 2) describe the associations between students’ personal/academic characteristics and the perceived impacts on students who complete these experiences; 3) to determine if the type of positions secured by students after completing their MIAP degree had any associations with the characteristics of their international experiences.

**Methods/ Data Sources**

Data from the last two years is used to highlight students’ characteristics, their choices of destination continent for international experiences, and the nature of their first post-graduation jobs. A total of 79 MIAP graduates from the spring semester of 2012 to the summer semester of 2014 formed the study population. From this population, the 54 students travelled abroad and their academic and personal demographics provided data for this study. Data were obtained from students’ assignments, information provided by students on the exit survey, and from records of their first post-graduation employment. Descriptive statistics were used to analyze the data. Findings from an underway survey, expected to be electronically mailed by November 1, 2014 to MIAP alumni of the last two years will complement findings highlighted above.

**Results**

A preliminary examination of the data shows majority (78%) of the students undertake their internships during the summer semester; most students (33%) travelled to South America; and, (24%) travelled to either Africa or Australia and New Zealand. About 15% of the students travelled to Europe and less than 5% to Asia. Prior international travelers initiated longer internships farther away from home. We found no relation between academic performance and the choice of destination. Some students who chose Africa as their destination had rural entrepreneurship and agricultural business development as their focus areas; non-traditional students had short stays abroad and some wanted domestic internships in the United States or Canada. Students spent an average period of 4.9 weeks overseas. Non-governmental (NGOs) organizations provide about 60% of the opportunities for students’ internships; military/government agencies, and church organizations each account for about 10% of the internship opportunities. In developed countries, about 47% of the students ended up learning from the agricultural practices of these countries. However, when students’ international experiences were in developing countries, about (33%) of the students found themselves involved in some teaching role. About 19% of the students were involved in non-teaching/learning activities

**Educational Importance**

Findings of this study could be a guide to internship and study abroad instructors to better prepare students to have the most impactful experience. This is especially important as study abroad experiences are an essential component of the curriculum.
References
An Assessment of Extension Workers’ and Farmers’ Knowledge and Practice of Riverbank Protection in Chikwawa District, Malawi

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Introduction
Malawi is an agricultural, but land-scarce country, with a unimodal rainfall that ranges annually (November to April) from 700 mm in low altitude areas of the country to 1,225 mm in higher plateau areas, with protracted dry spells (GoM, 1999). Farmers who live along rivers and streams practice extensive irrigation to counter the adverse effects of erratic rainfall and droughts (Nankhumwa, 2004) and some can grow crops all year-round (Kamthunzi, 2000; Peters, 2004) thereby contributing to food security, poverty alleviation and rural development (CTA, 2003; FAO, 1996; Maweru, 2004). They use different water tapping devices (Lwesya, 2004) such as treadle pumps, motorized pumps, watering cans and, recently, river or stream diversion. But river-line irrigation farming can lead to serious land degradation (GoM, 1999), silting and drying up of rivers if effective protective measures are not put in place. Since soils in the river and stream banks are the most fertile and easy to work with, farmers are tempted to cultivate even down to the edges of the banks or even the stream bed (Mlowoka, 2008).

Purpose and objectives
This study was conducted to establish the extent to which river bank management is practiced in Chikwawa District. The specific objectives of the study were to: (a) assess extension workers’ knowledge on the recommended river bank protection practices; and, (b) assess smallholder irrigation farmers’ knowledge and application of recommended river bank protection practices.

Methodology
The study was conducted in Chikwawa District, a generally dry low altitude area in the Shire Valley with an annual average rainfall of 700mm (GoM, 1999). Key recommendations on the dimensions and management of buffer zones were identified from a guide produced by the government (GoM, 2004). Based on the key recommendations a
A knowledge test was constructed to assess extension workers’ and 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 - two from the Ministry of Agriculture and two from the University of Malawi. All 23 extension workers in the study area and 200 irrigation farmers were selected for the study. The 200 farmers were selected from three sites through a quota system. 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.

Results, discussions and conclusions

The study revealed low knowledge in extension workers and farmers as well as low application of river bank protection recommendations by farmers. Over 80% of farmers scored below 50% and 65% of extension workers scored below 60% with mean scores of 35.46% and 56.4% respectively. On practice, many farmers (93%) scored below 50% with a range of 0 to 59% and mean of 26.32%. Buffer zone width ranged from -2 to 8 metres with mean of 2.84 metres meaning that some farmers cultivated on river bed. Shortage of land was given as the main reason for not observing the buffer zone specifications. Close examination of the recommendation also revealed inherent problems. According to recommendations, farmers are not supposed to cultivate within five meters of small stream-banks and 15-40 meters of big rivers depending on the position the farmer is along the river. Firstly, 5-40 meters is a lot of land for farmers who have less than 0.1ha irrigation land on average. The high population growth of 2.8% in Malawi (GoM, 2008) is putting pressure on the small country forcing farmers to cultivate virtually everywhere where they can grow a crop. Secondly, it is not easy for extension workers, let alone farmers, to determine the position they are along the river so as to determine the width of the buffer zone. The study concludes that the extent of river bank protection in Shire Valley is low as a result of low knowledge in staff and consequently in farmers, and that land shortage is one of the major contributing factors.

Recommendations

Extension workers play an indispensible role in driving the agricultural modernization process. The study recommends developing the capacity of extension workers to ensure that they can provide appropriate advice to farmers. The study also calls for a relook at the applicability of the existing recommendations on river bank management given the land scarcity. In addition, the study raises questions about how knowable some of the recommendations are and calls for their simplification.

References


An Assessment of the AGNR Faculty Ambitions for International Leadership Opportunities

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Keywords: International ambitions, University faculty

Introduction
Historically American Universities have been involved in international issues (Kock & Weeks, 2014), but with recent interest in USAID “Feed the Future programs”, more universities have begun addressing global food security on an international scale. In years past, United States Agency for International Development (USAID) and United States Department of Agriculture (USDA) have selected universities and Cooperative Extension to provide leadership in implementing international development projects (USDA, 2007).

Theoretical Framework
International educational opportunities not only provide valuable learning opportunities for university faculty, but also for their students upon their return to the university. Theoretically, this study was based upon Human Capital Theory. It was theorized, that human capital development (investment in humans) can be analyzed similarly to physical capital investment (Van Loo & Rocco, 2004). As such, human capital theory involves the development of practices that encourage expansion of content knowledge, to the benefit of students in their classes (Smylie, 1997). Since intellectual growth of students relies upon experiences and knowledge of university faculty, overall institutional-quality is dependent upon the professional development of university faculty (Lieberman, 1995).

Purpose
The purpose of this research was to determine international leadership of College of Agriculture and Natural Resources (AGNR) faculty. Administrative changes in the Office of International Programs in Agriculture and Natural Resources (IPAN) needed a clearer understanding of the internationalism of college faculty prior to developing new departmental opportunities. As such, results of this research were used by IPAN in the development of future international educational programming. The Office (IPAN) was aware of some of the international opportunities facilitated by faculty, but not many. Furthermore, IPAN was not aware of the programmatic or geographic areas where faculty
had or were working. Most of the international leadership conducted by faculty was through the university, federal agency, or individual consulting.

Methods
The IRB approved census study was implemented on-line in August, 2013, with all faculty (445) in the college of agriculture being asked to participate in a 30 question survey of past experiences and aspirations in international leadership. The instrument was designed by IPAN administration and key AGNR faculty already working in the international sector, and reviewed by a panel of experts (AGNR administration). The instrument sought participants past experiences and current goals in international leadership, and was sent to all faculty in the college using the college email listserv. The research followed Dillman’s established protocol for on-line survey research. A 36% response rate was achieved, with the majority (65) having an Extension appointment.

Findings
To gain a better understanding of faculty aspirations, respondents were asked about past experiences. Of those that responded, 92 (66%) indicated past international experience within the 2012 – 2013 academic year. Moreover, data indicated those who worked internationally did so in one to two week assignments in three geographic locations, Africa, Asia, and Europe. The primary outlet for their experiences came from federal agencies, the university, department, or consulting not the office of International Agriculture and Natural Resources (IPAN).

When asked of their interest in international opportunities, 75% of those surveyed responded in the affirmative, with 25% indicating some or no interest. Those surveyed identified their primary area of interest was in cooperative research, followed by extension fieldwork, and teaching duties. When asked if participating in an international program would be beneficial to their students or their careers, 74% responded it would benefit their students while 69% thought it would benefit their careers. When asked of their preferred length of international stay, respondents (36%) indicated a willingness to commit to one to two week experiences, while 29% indicated they would commit for one month. However, when asked about serving in international leadership roles, only 40% indicated they would provide leadership in international activities. Data also indicated 59% believed their department would support their international interests, but also believed research would need to be the primary outcome. When asked what regions of the world respondents had the most interest in working, 52 (43%) indicated Asia, 51 (42%) indicated Europe, and 47 (39%) indicated Africa. Of those that responded, 70% (87) indicated they were in a tenure track position, with an equal demographic gender representation, between the ages of 46 – 65.

Conclusions/Implications
The majority (74%) indicated that an international experience would be beneficial to their students and their careers. It was also apparent those faculty were most interested in department driven (not IPAN) one to two week assignments in Asia and Europe. Thus, limiting the reach of the college and the expertise that is needed on long-term international development projects.

References


An Assessment of the Effectiveness of Audience Response System (ARS) Technology to Improve Pesticide Safety Extension Education among Hispanic Agricultural Workers in South Florida: Implications for Agricultural & Extension Education

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Introduction
Numerous studies have documented that Hispanic agricultural workers face a disproportionately higher risk of health issues related to exposure to agricultural pesticides. Efforts to address the problem through pesticide safety education are often hampered by linguistic and cultural barriers, suspicion of formal institutions and a general apprehension by Hispanic agricultural workers to respond to formal research instruments (Martinez-Feria, 2011).. Audience Response Systems (ARS), with their advantages of greater anonymity and confidentiality, and the immediacy of data collection (Carlson, 2014), offer great potential to reduce some of the major barriers to collecting data from Socially Disadvantaged Hispanic agricultural workers

Purpose and Objectives
The purpose of the study was to evaluate the effectiveness of Audience Response systems (ARS) as a tool to collect data from Hispanic agricultural workers in South Florida on pesticide safety, learning performance and sensitive demographic information. Specifically, the study sought to evaluate the advantages of ARS as a data collection technology with Hispanic agricultural workers who participated in a series of pesticide safety workshops. The study used the following evaluative criteria: response rate, data reliability and the comfort level of respondents with ARS. Finally, the study sought to draw implications of using ARS for improving data collection and the effectiveness of extension and education programs.

Methods and/or Data Sources
The study adopted a descriptive research methodology. Its population consisted of 113 Hispanic agricultural workers who attended Worker Protection Standard (WPS) educational (Pesticide Safety) workshops conducted by the University of Florida Institute of Food and Agricultural Sciences (UF/IFAS) Extension Service in Miami Dade County.
The instrument for data collection was the Audience Response System (ARS) with Turning Point clickers which respondents used to answer to questionnaire items presented as PowerPoint slides delivered in Spanish during each class.

**Results and/or Conclusions**

The major findings of the study were as follows:

- Of the 113 participants in the workshops, 110 completed the survey instrument representing 97% response rate. Cronbach reliability coefficient was .96, a higher number than conventional survey instrument.
- Hispanic agricultural workers represented a wide diversity of nationalities from South America, with respondents of Mexican descent being predominant (45%), followed by Guatemalan. This finding is consistent with findings reported elsewhere in Hispanic agricultural workers literature.
- The study population was relatively young with 30% falling within age group 25 years or younger, 20% within the age group of 25-30 years, and only 15% were aged 41 and above.
- Average agricultural work experience was 6-10 years.
- Seventy percent of respondents indicated they have had no prior pesticide safety training, despite working in agricultural work environment where pesticides were used. There were no significant differences based on respondents’ age groups or country of origin.
- In addition to a higher data reliability coefficient and response rate, greater anonymity and confidentiality, researchers were able to clarify linguistic and interpretational ambiguities right on the spot, thus reducing one of the major data reliability concern in traditional questionnaire survey methodology.

Based on results obtained from this pilot study, it is concluded that the ARS clickers provided an efficient and integrated approach to collecting sensitive demographics and educational outcomes information from hard to reach populations such as Hispanic agricultural workers. It advantages include its non-threatening nature, higher guarantee of confidentiality and anonymity, reducing linguistic and interpretational ambiguities and a higher response rate.

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

- The application of ARS for data collection, program planning and assessment of learning outcomes offers great potential for improving the effectiveness of agricultural and extension education programs, including pesticide safety education programs.
- The finding of an incredibly high percentage of Hispanic agricultural workers not having received pesticide safety education raises serious ethical and consumer safety issues in the United States and great implications for agricultural and extension program to increase pesticide safety education in culturally and linguistically sensitive formats.
- The findings of this study raises the following questions for agricultural and extension education programs: To what extent do Hispanic minority agricultural workers understand the topics or education materials designed for pesticide safety training? To what extent do we take cognizance of the level of literacy, cultural and
linguistic nuances of our clientele in program planning and delivery for minority agricultural workers?

- More studies are recommended to assess ARS effectiveness as a tool for data collection and assessment of educational programs learning outcomes.

References


An International Service-Learning Opportunity in Uganda: What were the Lived Experiences of Six University Agriculture Students?

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Introduction

As the global population escalates, food insecurity remains a primary concern in many developing countries (Committee on World Food Security, 2013). Nowhere is the problem more acute than in Sub-Saharan Africa (SSA) (Halweil & Nierenberg, 2011). The U.S. Department of State intervened to improve food security in SSA by funding a Food Security Fellows (FSFs) project in Uganda, as proposed by [Name] University faculty. The project sought to reduce food insecurity through an initiative aimed at improving communication and collaboration among media professionals, community leaders, and policymakers (George et al. 2014).

This study focused on a service-learning component embedded within the larger project enabling students to participate. The students – undergraduate and graduate – were aspiring agricultural educators and communicators. They were expected to contribute to the project’s objectives by sharing their knowledge and experiences of U.S. agriculture, especially in regard to teaching youth and recruiting them as human capital for the sector.

Theoretical Lens

Kiely’s (2005) Transformative Learning Model for Service-Learning (TLMSL) was the theoretical lens used to capture the essence of the students’ lived experiences. TLMSL includes five components: contextual border crossing, dissonance, personalizing, processing, and connecting (Kiely, 2005). The components were used to interpret the study’s findings.

Purpose

This transcendental phenomenology’s (Moustakas, 1994) purpose was to understand the lived experiences of university agriculture students who participated in an international service-learning opportunity involving issues of food security in Uganda.

Methods/Data Sources

Phenomenology was an appropriate qualitative research design because it is “well suited to studying affective, emotional, and often intense human experiences” (Merriam, 2009, p. 26). The researchers purposely selected six project participants who were [Name] University agriculture students during 2011 and 2012. A 60-minute long, semi-structured interview was conducted with each participant. Thereafter, Moustakas’ (1994) procedural recommendations to attain
phenomenological reduction of raw data were followed using NVivo data analysis software. The coding technique horizontalization was used to properly scrutinize the raw data (Moustakas, 1994). After themes emerged, textural and structural descriptions were developed to describe what the phenomenon was and how the lived experiences were shared by the participants (Moustakas, 1994).

Results/Conclusions

TLMSL’s (Kiely, 2005) components framed the first five themes of this study. However, a sixth theme emerged, Sustained Relationships, and represents a divergence from the study’s initial theoretical lens.

**Theme 1: Contextual Border Crossing**
Each participant explained how personal factors framed his or her views through a unique and idiosyncratic lens during the experience.

**Theme 2: Dissonance**
Students recalled a range of emotions during their trip. From fear to uncertainty, three participants ultimately described their time in Uganda as an “emotional rollercoaster.”

**Theme 3: Personalizing**
Participants understood how their emotions placed the experience into perspective for them. A student explained: “If you don’t have that shock, or you [don’t] have that ah-ha moment, I don’t think that you would grasp the full concept of the project.”

**Theme 4: Processing**
To reflect on their experiences, purposeful blogging and journaling was done by several of the participants (Hubbs & Brand, 2005).

**Theme 5: Connecting**
The participants explained that making presentations to various groups about their experiences helped them to understand how their global perspectives had changed.

**Theme 6: Sustained Relationships**
Contact through social media and electronic mail with individuals met in Uganda allowed the participants to continue to challenge and refine their perspectives on global issues. The essence of the phenomenon is best understood as a *Transformative Shift in University Agriculture Students’ Global Knowledge and Perspectives.*

Educational Importance/Implications/Recommendations

Results suggest university students’ global perspectives can be changed through an international service-learning experience. This finding is encouraging as universities seek to enhance students’ international awareness and global knowledge (Knight & DeWit, 1995; Moriba, Edwards, Robinson, Cartmell II, & Henneberry, 2012; Navarro & Edwards, 2008). We recommend, however, that practitioners make the purposeful delivery of these experiences a priority. For instance, students’ should be given sufficient time to reflect on and process their experiences (Kiely, 2005). Several study participants were required to blog or journal daily (Hubbs & Brand, 2005). We concluded this reflection strategy allowed those students to more deeply assess prior predispositions and make sense of how their perspectives were being altered. Because the Sustained Relationships theme emerged, we also recommend further exploration on how continuing relationships through social media contributes to the transformation of students’ global perspectives. Finally, we recommend practitioners of international service-learning design opportunities encouraging the alteration of students’ global perspectives in positive and transformative ways.


An Investigation of Training Needs Assessment of Vegetable Growers in Jordan

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Keywords: Production, Marketing, Management, Needs assessment, Vegetable growers, Jordan.

Introduction
The limited land and water resources present a long-term constraint to agricultural development in Jordan (MOW, 2009). This calls for adopting a strategy to support farmers with technically sound and financially feasible technologies (Campbell and Barker, 1997; MOA, 1998). Needs assessment (NA) is the starting point in extension programming. Traditional practices to NA were based on personal value judgment and not responsive to the needs of farmers (Swanson, 1997). Professional NA aims at setting priorities for extension programs based on information gathered from the people likely to be affected by these programs (Caffarella, 1982; Swanson, 1997; McCaslin and Tibezinda, 1997; Altschuld and Kumar, 2004). In USA, three broad needs of educational needs for small
farms were identified: production, marketing and management (Suvedi, Lapinski, & Campo 2000; Ekanem, et al., 2001).

**Purpose and Objectives**

The study aimed at: assessing the perceived educational needs of farmers in two irrigated areas in Jordan in the fields of production, marketing and management; investigating effective extension methods and analyzing differences in educational needs of farmers in the two areas.

**Methodology**

A random sample of 98 vegetable growers in Baqqa and Mafraq Governorates in Jordan was used. Three 4-point Likert-type scales were used as instruments to gather primary data. Cronbach's alpha coefficients (0.88 to 0.91) indicated high internal consistency for the scales (Tavakol & Dennick, 2011). Parametric methods were used to analyze the data based on approximations to normal distribution.

**Results & Conclusions**

Aged people with basic education, who are very largely dependent on farm income, are still the ones most engaged in vegetable farming. Higher ratings were observed for the need for training in marketing and production fields, and the rates were significantly higher in Mafraq, while ratings were low for management in both governorates. Farm business management education appeared to be less relevant because its immediate benefits are less evident. This supports previous research that many producers in different parts of the world do not perceive the need to participate in training activities to upgrade their management skills (Murray-Prior et al., 2000; Breazeale, Myer, & Hill, 2001; Rimawi, Karablieh, & Al-Kadi, 2004). This indicates the complexity of integrating farm management in extension work.

Age, education, farming experience, type of holding, farm size and full time farming were important factors in explaining differences in educational needs. Needs are location specific, based on a particular set of farm conditions and socio economic conditions. Ajzen (2006) emphasized that perceptions are affected by socio economic factors. This has implications on how resources are allocated by the farmers.

The results showed that the extension methods farm visits, group meetings, demonstrations and farm tours were the highest ranked. Similar results were found by Khan and Akram (2012) in Pakistan. Low rated methods (< 2.4) include ICTs (mobiles/ SMS), electronic media (CDs...) and internet to provide extension. Extension staff needs to be trained on how to use ICT tools as an extension method to enable them to inform and train farmers on how they can use ICT tools. ICTs are cheap and do not need physical classroom facilities and its scheduling is much more convenient (Quesada-Pineda, Conn, & Scarlett, 2011).

**Implications and Recommendations**

The study contributes to the development of appropriate extension services and training programs to support competitive farming by improving farmers' skills. The significance of farm management and marketing extension to promote business-like farming (Penrose, Smith & Vollborn, 1999; Suvedi et al., 2000; Rodier, 2007) adds to the efforts to integrate business management dimension in extension, especially in developing
countries, to keep agriculture viable and competitive (Shepherd, 2011). The diversity of the educational needs calls for concerted efforts of the public and private extension and the educational institutions to ensure effective extension and training programs (Rimawi, Barakeh, & Hawamdeh, 2012). The actual involvement of the extension staff in this research contributes to the application of the needs-based extension approach.

Targeted groups should be surveyed in order to better understand what specific subject matters are needed and in what forms they prefer the information to be extended. The methodology explained in this study is useful for the initiation of NA assessment surveys in an ongoing situation analysis. To make it operational, it is suggested that a detailed manual be made available to help extension agents on how to conduct NA. A variety of techniques have to be outlined to enable the agents to choose the best one for their purposes (Etling, 1995).

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References


An Overview of Information Needs and Information Seeking Behavior of Farmers: A Case Study in Puliyankulama area, Anuradhapura district, Sri Lanka

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Keywords: ICT, Farmer behaviors, Sri Lanka, Extension

Introduction
Agriculture contributes about 12% to the GDP in Sri Lanka. About 70% of the country’s rural population depends on agriculture and related livelihoods. Agricultural information and communication play an important role in the agricultural value chain, hence improved outcomes rely on understanding information needs and information-seeking behaviors of farmers. However, rural populations often have difficulty in accessing crucial information to make timely decisions (Anandaraja, Chandrakandan, & Ramasubramanium, 2008).

Purpose and objectives
This abstract examines the information needs and information-seeking behavior of farmers in Puliyankulama area, Anuradhapura district, Sri Lanka.

The objectives were to describe:
1. the information needs of farmers in the area;
2. the information sources of farmers in the area; and
3. farmers’ perception of agricultural information sources in the area.

Methods and Data Sources
Fifty-three randomly selected farmers were surveyed using a questionnaire. The questionnaire was which was pilot tested with a group of different farmers and revised as needed. Key informant discussions were conducted with 10 people to triangulate the data. Descriptive statistical analysis was performed using Statistical Package for Social Sciences (SPSS). Data collected using Likert-type scales are reported as means and standard deviations and nominal data are reported using frequencies and percentages.

Results and Discussion
About 54% of the farmers need information on controlling pest and disease. In Puliyankulama, a highly agricultural area, farmers face severe economic problems due to yield losses directly related to pest incidences. Lack of reliable information dissemination networks has resulted in overuse of chemical pesticides, creating environmental and health hazards. Additionally, farmers need information related to: (a) seed and planting material (17%), (b) farm mechanization (11%), and (c) marketing (8%). Major problems facing farmers were: (a) irrigation (63%), (b) labor scarcity (40%), and (c) planting materials (45%).

**Information-seeking Behavior**

Farmers preferred to receive information primarily from: (a) agrarian service centers (28%), (b) farmer organizations (18%), and (c) fellow farmers (13%). About 9.6% of the population had computers at home even though they are not using them to receive agricultural information. As an ICT (Information & Communication Technology) initiative, the “Cyber Extension” mechanism was implemented by the Department of Agriculture in 2004 (Wijekoon & Rizwan, 2010). However, farmers did not have cyber extension facilities available to them.

**Perceptions of Agricultural Information Sources**

About 65.3% respondents had mobile phones, 16.3% respondents had land phones, and 18.4% respondents had both. However, only 26.1% of the respondents used either mobile or land phones to obtain agricultural information. Survey results indicated that about 83.7% of the respondents like to receive agricultural information via land-phones. Toll free agriculture advisory service was established by the Department of Agriculture to respond farmers’ inquiries immediately. However, only 30% farmers in the Puliyankulama area were aware of the service and only 12% had used that service to obtain relevant information.

Mass media such as newspapers, radio, and television play a vital role in disseminating information quickly, reaching large number of audience at once. All these media include at least a few agricultural messages/programs per week. According to a content analysis of three major national newspapers in Sri Lanka in the year 2009, the percentage (space) allocated for agriculture related information was 0.4%-0.8% (Aberathna, Dissanayake, & Wanigasindera, 2010). According to the present study, 80% of the farmers read newspapers and pay special attention to agricultural information.

Farmers’ perceptions toward agricultural extension officers were also examined. According to the results, farmers were not satisfied with the service provided by extension officers. The main reason was difficulty in obtaining services in times of need.

**Recommendations**

Farmers receive agricultural information through newspapers than radio or television and no one uses computer-based information sources. Even though the Department of Agriculture has invested a huge amount on toll-free agriculture service and Cyber Extension Units, farmers in the area seem to have little awareness of these resources, highlighting the importance of promoting mobile communication methods.

More accurate, timelier information would help farmers to make informed decisions. Farmers need to be informed about market orientation rather than production orientation. As most of the government agricultural institutes are located in the
Puliyankulama area, programs should be designed to strengthen information sharing with farmers.

Inadequate or untimely focus on farmers’ problems by extension staff could result in inappropriate dissemination of information. Therefore, the Department of Agriculture should consider increasing the number of extension staff and providing proper infrastructural facilities.

References


Assessing the Impact of International Service-learning: A Community Case Study

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Keywords: Reciprocity, Qualitative, Service-learning, Community, Impact.

Introduction
Higher education institutions are increasingly integrating service-learning into their academic programs. One central component that is acknowledged in nearly all literature related to service-learning is reciprocity (Crabtree, 2008; d’Arlach, Sanchez, & Feuer, 2009; Harrison & Clayton, 2012; Lowe & Medina, 2010; Miron & Moely, 2006; Porter & Monard, 2001; Remley, 2012; Sandy & Holland, 2006; Ward & Wolf-Wendel, 2000; Worrall, 2007) whereas all involved should contribute to program building and benefit from participation. While there is a growing body of research analyzing the impact of service-learning on student academic learning, critical reflection, engagement, and personal growth, the impact on the communities, especially as measured by community members themselves, has received less consideration.

The purpose of this study was to determine the impact of [US institution] service-learning programs in San Luis, Costa Rica, from the perspective of San Luis community members.

This study used a qualitative research approach (IRB 2013-10999-0), and based the analysis on interview and participant observation data. The researcher interviewed 23 San Luis community members (of about a total of 300), primarily through thirty to sixty minute one-on-one interviews in Spanish, and a few small group interviews. While the researcher had a good level of Spanish, she worked with a Costa Rican interpreter to help her minimize language and cultural barriers. The interviews were audio-taped, translated, and transcribed. The data was analyzed through thematic coding by first unitizing and then categorizing. Trustworthiness was pursued by trying to maximize credibility (prolonged engagement, persistent observation, and triangulation using both interviews and participant observation, and using two separate researchers to analyze the data), transferability (thick description), dependability (purposeful selection of information-rich participants, quasi-natural setting, interviews conducted until saturation point was reached), and confirmability (reflective journal, bracketing interview, subjectivity statement) (Lincoln & Guba, 1985).

The community recognized the following major benefits from their involvement in service-learning programs: Intercultural exchange, productivity, economic benefits, and transfer of knowledge.
• Intercultural exchange: Subthemes were connections and shared experiences, long-lasting relationships (from participants who had hosted students in their homes), practicing language (and opportunities for community kids to learn English), and learning new ways of doing things.

• Productivity: Subthemes included a larger labor force, ability to finish jobs faster, new opportunities (or acknowledgement of existing opportunities that otherwise would not have been considered), and strength in numbers.

• Economic benefits: Subthemes included more jobs in the community, more money in the community (laundry and meal services, homestays), and economic gains thanks to the improvements provided by some projects.

• Transfer of knowledge: Subthemes included sharing “knowledge” ideas, innovation, and academy to practice exchanges. One participant noted that many farms had biogas digesters installed as part of service-learning projects, and while he did not receive one, he was able to use the knowledge he gained from the workshops and participation in collaborative programs to install one on his own.

Most participants did not identify any negative impacts of service-learning programs and considered the [University] programs in their community to be “model” models. However, immediately after saying that there were no negative impacts, some participants indicated that sometimes the work, time, and effort invested to develop and facilitate student projects was often higher than they would have needed had they completed the projects themselves. In addition, the idea of division in the community emerged as a negative impact of interactions with the university, with some interviewees indicating that there was an unbalance on how the residents from “upper” San Luis benefitted as compared to the residents from “lower” San Luis, and there were feelings of preferential treatments.

Findings from this impact assessment can help enhance [University] service-learning programs in San Luis, Costa Rica. Specifically, all involved (faculty, community members, administrators, students) should further consider the importance and meaning of the projects to the community and individual participants, and develop more sophisticated strategies to minimize the additional time, work, investment and effort community members devote to the development of the projects and the “unproductive elements” of their interaction with students. Furthermore, [University] representatives need to communicate and collaborate with community members from both “upper” and “lower” San Luis to determine how divisions and [perceptions of] unbalanced benefits can be minimized or eliminated.

To claim reciprocity as an important tenant of international service-learning it is important to give more voice to the community and better assess impact. Increased collaboration and reciprocity in program development will help enhance design of service-learning programs, maximize benefits, and minimize community fatigue and negative consequences.

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Assessment of a Professional Fellows Program to Empower Entrepreneurs for Economic Success in Sub-Saharan Africa

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Keywords: Entrepreneurs; Professional fellowship; Sub-Saharan Africa

Introduction

“The development of small- and medium-sized enterprises (SMEs) has been an integral part of the development of all industrialized economies. This holds true in Africa” (Juma, 2011, pp. 142 – 143). However, “it is also clear that local businesses, especially budding entrepreneurs, face considerable barriers” in Africa (Moss, 2007, p. 235). The U.S. Department of State intervened to improve the knowledge and skills of entrepreneurs in Sub-Saharan Africa by funding an Entrepreneur Fellows program, as proposed by [Name] University faculty in 2013.

The 12 Fellows included agribusiness entrepreneurs, food and textile purveyors, and business educators from Kenya, South Africa, and Uganda; four represented each country. The training program or fellowship included topics on entrepreneurship and small business development, and internship/job-shadowing experiences tailored to the Fellows’ entrepreneurial interests and aspirations.

Conceptual/Theoretical Framework

The Theory of Planned Behavior (Ajzen, 1991) undergirded the fellowship’s objectives and informed its assessment. By this theory, changes in the Fellows’ post-fellowship entrepreneurial behaviors were dependent on their intentions going into the experience and on what occurred during it. These intentions would influence their
perceptions of its benefits and related attitudes. It was also posited that the Fellows’ attitudes would be informed by the knowledge and skills they perceived acquiring and associated with the entrepreneurial behaviors they intended to exercise after the fellowship. In other words, what Ajzen (1991) called perceived behavior control, including the extent to which their entrepreneurial potential had been inspired (Kuckertz & Wagner, 2009).

**Purpose/Objectives**

The study’s purpose was to assess the Fellows’ perceptions of their fellowship experiences by describing change in attitudes, knowledge, and skills related to entrepreneurship. Four objectives guided the study: 1) describe change in the Fellows’ attitudes regarding aspects of entrepreneurship; 2) describe change in the Fellows’ knowledge regarding aspects of entrepreneurship; 3) describe change in the Fellows’ skills regarding aspects of entrepreneurship; and 4) summarize themes derived from the Fellows’ narrative comments regarding their fellowship experiences.

**Methods/Data Sources**

Change in the Fellows’ skills and attitudes were assessed using pre- and post-tests aligned with the fellowship’s beginning and ending. The assessment of skills included five items measuring *levels of confidence* with a 5-point Likert scale. Attitudes were measured using 10 items and a 5-point Likert agreement scale (*1, strongly disagree* to *5, strongly agree*). 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 they had limited knowledge about such, testing the Fellows at the beginning may not have been valid (Rockwell & Kohn, 1989). Therefore, a retrospective pre- and post-test design was used for knowledge. Paired samples *t*-tests were computed to summarize the quantitative data. The Fellows’ narrative statements about their fellowships were subjected to content analysis (Hsieh & Shannon, 2005) and thematic coding to distill predominant themes (Creswell, 2007).

**Results/Conclusions**

Paired samples *t*-tests revealed no significant change (*p* < 0.05) in skills or attitudes from pre- to post-fellowship. In regard to skills, the Fellows perceived they were *confident* before the fellowship and slightly more afterward. Attitudes regarding entrepreneurship in the United States remained stable near the mid-point between *agree* and *strongly agree*. For knowledge, however, as measured retrospectively (Rockwell & Kohn, 1989), the Fellows perceived acquiring a substantial amount of new knowledge on topics of entrepreneurship, e.g., customer service. The aggregated mean score changed from 19.55 (pre; *low*) to 37.00 (post; between *moderate* and *high*) (*t*(10) = -8.164, *p* < 0.001). The Fellows’ narrative responses were grouped into 15 categories and aggregated to form five themes: altruism; citizenship and culture; entrepreneurial skills and concepts; leadership; professional networking and relationships. Statements supporting the themes were mostly positive in describing the Fellows’ personal growth and future aspirations.

**Implications/Recommendations/Educational Importance**

The fellowship had the most impact on participants’ perceptions of change in their knowledge on topics of entrepreneurship. The study’s interpretive findings supported this implication. Such topics, their presenters, and similar internship experiences should be
retained for future programs. Little change was found for skills acquisition and attitudes but in the case of both much less space existed in which to reveal improvement, i.e., from *high* (pre) to *very high* (post). The small sample size may have contributed to the lack of significance. Personal interviews and/or focus groups may explain more in regard to skills acquisition and change in attitudes. Nevertheless, considering different approaches to program delivery may be warranted.

**References**


Assessment of Educational Needs of the Jordanian Public Extension Professionals and Their Attitudes towards Needs-Based Extension

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Keywords: Needs assessment, Needs based extension programming, Extension agents' competencies, Training, Professional development and barriers.

Introduction
Public agents in countries, including the USA, are often assigned to their positions without adequate training to be effective extension professionals (Tladi, 2004; Brown, Gibson and Stewart, 2008; Schwarz and Gibson, 2010; Swanson and Rajalahti, 2010; Rimawi, Barakeh, & Hawamdeh, 2012). Establishing effective linkages and communicating grower's problems necessitates conducting needs assessment, especially when agents start working in an area if appropriate programs and solutions are to be offered (Swanson, 1997; Radhakrishna, 2001; Caravella, 2006). Several areas were identified in which the extension services in Jordan need to be either updated or strengthened. These include marketing processes, agribusiness management, use of ICT, extension professional development and data collection and analysis (USAID, 2005; Rimawi, 2012).

Purpose and Objectives
The purpose is to introduce the approach of needs-based training for public extension staff to develop effective extension programming and activities. The objectives of the study were to examine the attitudes of the extension staff towards the adoption of needs-based extension (NBE) approach and to investigate barriers to the adoption, training needs and methods of training and the factors which account for staff differences in their attitudes and training needs.

Methodology
Data were collected personally from all extension staff of the Ministry of Agriculture (MOA) in June 2013 (73 agents, MOA data base), and 68 completed surveys were analyzed for the
study (93% rate of response). The data collection instrument includes four-points Likert-type item scales for ratings. Face validity was validated by a panel of experts from the MOA, and internal consistency was demonstrated with acceptable coefficient alphas ranging from 0.75 to 0.90 (Tavakol & Dennick, 2011). Parametric and nonparametric statistics methods were used to analyze the data.

Results & Conclusions

The public extension staff was found to be qualified, medium aged and most were experienced in agriculture. Female agents represented 22% against 5% of women farm holders. Agents had positive attitudes and willingness to adopt the NBE. But, intend to adopt NBE is constrained by external factors such as unsupportive financial and cultural environment to extension services, and internal factors such as lack of skills to undertake surveys, analyze data and present the results that would clearly identify farmers' needs. Highly identified training needs indicated agents' awareness of the significance of NBE and skills in ICT, agribusiness management and conducting needs assessment in an increasingly competitive environment. Study tours to countries with effective extension systems and professional or academic training were perceived to be important methods of training. Less experienced male agents with BSc in non-horticulture degree had more positive attitudes to NBE, and they were more likely to highly rate the need for training.

Implications and Recommendations

Professional needs assessment practices requires better skills and improved management. The extension staff are qualified and had developed large experience that could be passed down to subordinates on the job and to the growers. Therefore, initiation and adoption of NBE programming are feasible both technically and resource-wise. Many of the required skills can be greatly improved by well-targeted in-service training and establishing a core team of subject matter specialists to provide backstopping support.

An individual's performance of a particular behavior is the product of a favorable attitude, a supportive surrounding social environment and ability to perform the behavior (Armitage and Conner, 2001; Ajzen, 2006). Therefore, converting from conventional needs assessment based on long standing tradition of value judgment to one that is broader and people-centered NBE, calls for policy endorsement and improved management, financial support and cultural change in the extension organization (Moyo and Hagman, 2000). A detailed manual can be made available to help extension workers on useful techniques and how to conduct needs assessment (Etling, 1995).

NBE has to be supported by multiple information sources and must adapt to changes to meet the constantly evolving needs of growers (Sofranko and Khan, 1988). Communicating grower's problems to researchers contribute to appropriate programs and solutions (Radhakrishna, 2001; Rimawi, et al., 2012), and helps in promoting future funding of extension activities in the context of performance-based budgeting.

A practical and sound needs assessment is valuable to many situations beyond the case of Jordan. It is also applicable to others who work with similar clientele in health and education services (Caravella, 2006). Many other countries have assessed the training needs of extension agents such as Pakistan (Khan et al., 2012), Botswana (Tladi, 2004), Uganda (Erbaugh, Kibwika & Donnermeyer, 2007) and Nigeria (Ovwigho, 2011), and the implications of the study are not limited to the Jordanian agents.
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References


Assessment of Leadership Abilities Essential for Extension Delivery among Agricultural Extension Agents in Ogun State, Nigeria

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Introduction

Agricultural extension in Nigeria continues to improve the quality of life of rural people within the framework of the national economic and social policies. The effectiveness of extension depends on the extension personnel to provide quality leadership needed for the transformation in agriculture. Agricultural extension is faced with major leadership challenges such as addressing the issues of inadequate leadership knowledge and experience, leadership competencies and styles required to address emerging information technology and access to information and inadequate professional training of managers of extension in the management of leadership competencies and styles (Ladewig & Rohs, 2000).

In extension, leadership function of management is achieved through staff motivations, promoting good work, group behavior and good/ effective management and communication. Attributes such as educational qualifications, skills, experience, physical characteristics, mental abilities, values, and attitudes needed for extension are necessary formal training in agriculture, practical skills and experience in farming and knowledge of modern farm practices. The success of an extension service organization is reliant on the leader’s ability to optimize human resources (Khalil, A.H.O., M. Ishmail, T. Suandi and A.O. Silong, 2008). Also, Dubrin (2007) opines that effective organization requires effective leadership and that organizational performance will suffer in direct proportion to neglect of leadership.
Furthermore, Maritz asserted that the effectiveness of any set of people is largely dependent on the quality of its leadership, which facilitates the attainment of the follower’s desire, which then result in effectiveness. The extension worker fits in as a leader as he is saddled with the responsibility of capacity building through advising farmers on opportunities in production, marketing, conservation and family livelihood. Training and retraining of extension workers on leadership behaviour have been suggested by Obiyai, Ekpebu and Ekubo (2011) if adoption of improved technologies by farmers are to improve. Leadership is unquestionably among important factors in determining if Extension will be capable of synthesizing future changes in demographics, science, technology, educational models, and human needs, and then developing a very clear and specific vision for our system.

**Purpose and objectives**

The unsatisfactory performance of extension staff often attributed to poor leadership abilities of extension personnel, is one of the most serious problems of extension in many developing countries such as Nigeria. The paper presents a study that assessed the essential leadership abilities agricultural extension agents for extension delivery in Ogun State of Nigeria. Specifically, the paper describes the extent to which extension agents possess the needed leadership qualities, the source of acquisition of the leadership skills and the constraints to the acquisition of good leadership skills.

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

The study used a survey-correlational design. A content-validated and self-administered questionnaire was used to collect data from a census of 62 extension agents from all the twenty Local Government Area (LGA) of Ogun State of Nigeria. The Director of LGA rated extension personnel on 32 leadership indicators which were constructed with the personnel and the Directors. Percentages, Frequencies, means and standard deviation were used to describe the data while Pearson product moment correlation ($r$) was used to identify the relation between the variables.

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

The analysis of socio-economic characteristics revealed that respondents were extension agents by rank and been working for a decade but somehow youthful (Mean age =42.1; S.D=2.05 years). The extension agents were mainly males, married with three average dependents. The education level is high but majority (83%) of personnel received very low salary ranging from Naira5000 and 24000.

Respondents perceived leadership skills such as humility, dependability, reliability, charisma and motivation to be very highly important for extension work. However respondents perceived leadership competencies were different from how they were perceived by their Directors.

Leadership competencies were acquired during on job orientation and on the job training. Pearson product moment correlation analysis revealed that extension agents who have high leadership skills perceived them to be very important to their work. Surprisingly as academic degree increases, perceived importance of leadership skills decreased.

**Recommendations, educational importance, implications, and/or application**
The study concludes leadership skills are essential for extension delivery in Ogun State of Nigeria. There is still the need to invest training of extension agents since their perceived competencies differ from the directors. The agricultural training institutions should also invest in training of students in leadership competencies. There also the need to motivate aged and highly educated extension agents to apply leadership skills in extension delivery.

**References**


Barriers to Accessibility and the Adoption of Innovations to Save Water in Rural South African Communities: Opportunities for South African Extension

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Keywords: Adoption and diffusion, Barriers, Extension education, Water

Introduction

By 2050, the world population is expected to be nine billion people (Folly, 2011). Approximately one billion people are undernourished, 578 million being from Asia and 239 million from Sub-Saharan Africa (Food and Agriculture Organization [FAO], 2011). Agricultural growth is imperative in developing countries to produce enough food to ensure security in the future and at present. An expected rise in population will require an increase in agricultural output. Such demands will substantially increase water consumption and water competition on a global scale (FAO, 2006). The most important limiting factor in agricultural production is water availability (Hachigonta, Nelson, Thomas, & Sibanda, 2013).

Ajzen’s (2005) theory of planned behavior was utilized to frame this study. Ajzen (2005) indicated attitudes were the disposition to respond favorably or unfavorably to an object, person, institution, or event. The theory stated that attitude toward behavior, perceived behavioral control, and subjective norms will shape an individual’s behavior and intention to perform a given behavior (Ajzen, 2005).

Purpose and Objectives

The purpose of this study was to assess water needs of farmers among two rural communities in South Africa. The research objectives were:

1. Examine barriers toward water availability in the South African communities; and

Methodology

A descriptive qualitative research design (Creswell, 2009) was used to conduct and meet the needs of this study. The researchers gathered the data in the South African communities of Makgato and Welverdiend during the winter of 2014. Members and leaders in the communities were interviewed and compared to understand barriers toward water availability and the innovations that have been adopted to transport and store water. The sample consisted of twenty participants (N = 20) to reach saturation of data. Ten
participants (N=10) from each community were interviewed. A snowball sampling method (Babbie, 2012) was also utilized to locate and identify participants by asking previous participants and locals who to interview (Babbie, 2012). A semi-structured interview process (Cohen & Crabtree, 2006) was employed with participants to help achieve the study’s objectives. The researchers used notes and audio recorders during interviews to record data.

**Results and Conclusions**

Due to space limitations of the abstract, themes of the qualitative data are presented here but would be expanded in more detail, if the presentation was accepted. Several themes emerged from the data. The findings from objective one indicated the primary barriers were lack of funding, leadership accountability, lack of employment, and limited security. The majority of participants (n = 16) indicated the local municipalities would not fund water conservation projects. P10 included, “We need to get more pumps but the municipality cannot fund the projects. It is not an easy process.” P2 added, “Twenty bore holes were dug this year, but there were no pumps available to get the water from the ground.”

The findings from objective two indicated sixteen (n = 18) of the twenty participants adopted innovations to transport and store water for agricultural purposes. The innovations ranged from jerry cans, rain water containers, jugs, wheel barrows, Hippo Rollers, drip irrigation, and tap systems. The majority of participants (n = 15) suggested large containers were the most effective innovation for agricultural production. P4 detailed the situation further, “We need water for our cattle and our agriculture projects. Our cattle numbers are increasing but not our water supply. Raining every day would allow me to keep water in a larger container for my livestock. Maybe one day I can, because we do not have water everyday…from the sky or the tap.”

**Recommendations/Implications/Educational Importance/Impact on the Profession**

Competent and excellent Extension Systems are needed to assist farmers in rural communities acquire and conserve water. Governmental and non-governmental Extension organizations can work with farmers to reduce barriers regarding the access of water. Farmers need education about conservation, water saving methods, sanitation, and technologies that efficiently use water. Training is needed to enable communal farmers to repair and manage water technologies. Extension personnel can promote community involvement and responsibility. When farmers are engaged in a project, they have a tendency to have more pride and ownership of a project. Opportunities exist for extension personnel to include experiential learning experiences by demonstrating the use of water transportation and storage innovations to promote adoption in rural communities. Extension personnel can better foster an understanding of the innovations to conserve water for farm and family use to aid in the battle against food security (Hachigonta et al., 2013).

**References**


Building Capacity for Food Security in Sub-Saharan Africa: Evaluating the Fellowship Experiences of Food Security Fellows from Uganda

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Introduction
Building capacity to mitigate the effects of food insecurity is critical to reducing hunger (Food Security Collaborative, 2012). The lack of cooperation between stakeholders involved with ensuring food security is frequently an impediment (Babu, Rhoe, Temu, & Hendriks, 2004). Babu et al. (2004) and Gervais (2004) recommended a pluralistic approach stressing the collaboration of stakeholders beyond those directly involved in agricultural production.

The U.S. Department of State provided funding for a Food Security Fellows (FSFs) program, proposed by faculty at [Name] University to create capacity in Uganda among media professionals, community leaders, and policymakers. The FSFs experienced internships in the United States resonating with their professional positions in regard to food security during 2011 (George et al., 2014). Short-term professional development for stakeholders engaged in food security increases their likelihood of staying abreast of new trends and innovations (Mutimba, Knipscheer, & Naibakelao, 2010). However, participants’ views of how the professional development impacted their behaviors should be assessed (Babu et al., 2004; Matofari, Edwards, Sitton, & Cartmell II, 2014).

Purpose/Objective
This qualitative study’s primary purpose was to explore and develop meaning from the lived experiences of Ugandan FSFs during their five-week fellowships in the United States and to assess how the Fellows practiced what they experienced and learned after returning home.
Theoretical Lens

Human capital theory and the theory of reasoned action (Hale, Householder, & Greene, 2002) undergirded this study. “[H]uman capital refers to [all] the acquired skills, knowledge, and abilities of human beings” (Hornbeck & Salamon, 1991, p. 3) attained through deliberate investments in both formal and non-formal education (McFadyen, 2006). Ajzen and Fishbein (1977, 1980) posited that a person’s intentions to execute a given behavior or action is governed by his or her attitude, as well as the subjective norm toward the behavior.

Methods/Data Sources

A phenomenological research approach enabled the researchers to find “common meaning of lived experiences” (Creswell, 2013, p. 76) through a “deeper understanding of the nature or meaning of our [i.e., the FSFs’] everyday experiences” (Van Manen, 1990, p. 9) and, therefore, derive the phenomenon’s essence (Moustakas, 1994). Nine FSFs were purposively selected (Patton, 1990) for interviews in 2012. A researcher-developed, semi-structured interview protocol was used (Creswell, 2013). Tracy’s (2010) eight procedural guidelines to ensure quality when conducting qualitative research were followed. Transcription of video recordings of the interviews was verbatim (Yin, 2011). Coding of the transcripts was done using ATLIS/ti software program and through negotiations between researchers; different codes were aggregated into five themes (Creswell, 2013).

Results

Four of five themes follow that emerged from coding and horizontalization of the data:

Theme 1: Change in perception about the United States and its citizens

Most participants’ images of the United States were derived from the mass media and movies. They thought Americans were very proud, selfish, and warmongers. However, to their surprise, this perception was not supported when they interacted with Americans who they described as loving and caring.

Theme 2: Personal development and work-related accomplishments

Most participants indicated they were promoted at their workplaces or received better jobs with larger organizations after the fellowship. The fellowship provided networking and collaboration opportunities with peers in different sectors regarding food security.

Theme 3: Impact of fellowship experiences on food security in Uganda

All participants agreed it was too early to assess their full impact on food security but some perceived they had started to realize positive results in their communities.

Theme 4: Challenges associated with implementation of the acquired knowledge

The media professionals indicated a lack of support from their colleagues who asserted agricultural stories were not as marketable to the general public as stories about politics and entertainment.

As a knife is sharpened so it cuts better, the participants perceived the fellowships had honed their general knowledge and skills regarding food security, which, in turn, offered them new professional opportunities. Such was the phenomenon’s essence.
Conclusions/Educational Importance/Recommendations

The fellowships provided learning and networking opportunities calibrated to improve food security and united three stakeholder groups to work on that objective (Babu et al., 2004; Gervais, 2004; Matofari et al., 2014). Similar fellowships should be undertaken (George et al., 2014; Mutimba et al., 2010) with the aim of creating additional human capital to address food security. Because less than one year had elapsed post-fellowship, and fewer than six months for some, more time should pass before assessing further the Fellows’ perceptions of their impact on food security.

References


Building Capacity to Integrate Gender in International Extension Programs

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Purpose and Objectives
At the request of country extension services, and in conjunction with the USAID funded “Modernizing Extension and Advisory Services” program (MEAS), gender capacity building workshops were conducted in Tanzania, Uganda, Mozambique and Ethiopia from 2011-2014. The purpose of the workshops was to: a) increase awareness of the importance of gender issues in agricultural extension programs; b) provide practical tools and approaches to integrate gender; and c) demonstrate strategies for integrating gender in project planning and agricultural value chain analysis.

Methods and Data Sources
Workshops were conducted with the premise that “there is a causal relation between more equal gender relations in the household and in the community, and better agricultural and development outcomes” (Farnworth and Colverson, 2014; OECD, 2010). All materials and workshop delivery were facilitated using a learner centered, participatory approach, starting with the participants’ understanding of gender and gender relations, and how these affect the success of their extension outreach. This approach has proven effective in training, especially regarding gender issues (Biermayer-Jenzano, 2011). Each participant received a pre-workshop assessment prior to the workshop with questions based on their knowledge and experience of gender. They received the same assessment after the workshop to determine the amount of knowledge gained. Each assessment contained a total of 15 questions. The difference between scores of the pre and post assessments was determined and the results used to modify materials and inform future workshop development and delivery.

Results and Conclusions
Participants in the four workshops consisted of extension providers from government, NGO, university or private sector organizations. Previous experience with integrating gender into their work varied widely, from no knowledge of gender, to individuals who were gender specialists or focal points within their organizations. A total of 136 individuals participated in the workshops.

Results from the pre and post-workshop assessments indicated the greatest change of knowledge in all workshops related to: a) Applying a specific gender analysis tool to an extension situation; b) Demonstrating a short, interactive gender energizer; c) Assessing when and how to apply gender analysis tools and participatory techniques to various extension situations. In three workshops (Tanzania, Ethiopia and Uganda) questions related
to “Compare and contrast techniques to engage mixed and single gender groups” and “Identify methods for monitoring and evaluating gender responsive programming” were highlighted as significant change areas.

**Recommendations and Educational Importance**

Integrating gender into agricultural programming is recognized as critical to project and program success, and is now an essential part of many international funding agencies proposals (USAID, 2010). Many front-line extension workers have little notion of how to effectively integrate gender, and even less about tools and frameworks that are available to do so (Ragasa, et.al. 2012). It is critical to equip all extension officers with the knowledge and skills to address men and women farmers equitably. Increasing the number of women extension agents is one avenue, but it is not the only way to reach more women producers and entrepreneurs. Male technical agents should be equally responsible for and capable of reaching women and vice versa (Manfre, et.al. 2013).

Few universities offer training programs or courses in gender integration and analysis, particularly as related to agricultural extension. Findings from the workshops in four African countries indicated a need for not only more training in practical use of tools and approaches, but the resources to follow up with workshop participants on their use and adaptation of gender tools, and the creation of more applied approaches that are context specific. Continued research needs to occur on the most effective methods to address gender equity issues in extension, as well as mechanisms to more widely disseminate information and approaches that are known to work.

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Capacity of Extension Personnel within the Pluralistic System of Liberia

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Introduction

Post-conflict Liberia is focusing on improving its extension system to increase agricultural productivity, enhance livelihoods, and promote stability. Liberia is transitioning towards a pluralistic extension model with collaboration between the Ministry of Agriculture (MoA) and non-governmental organizations (NGOs) (MoA, 2007). However, capacity differences between service providers threaten partnership and affect service delivery to farmers (McNamara, Swanson, & Simpson, 2011). Successful pluralism therefore requires a better understanding of the different service providers’ personnel capacities.

Research Objectives

The purpose of this study was to explore the existing capacity of extension personnel within Liberia’s pluralistic extension system. Two aspects of capacity were examined: (a) the individual capacity of personnel, and (b) opportunities to develop capacity. A comparison of these aspects between public and private service providers was conducted.

Methods

This study is part of a larger qualitative study intended to result in grounded theory (Strauss & Corbin, 1990). Purposive sampling was used to gather a breadth and depth of data and to examine the research problem from multiple angles. Maximum variation sampling was used to select MoA personnel to represent all levels, from administration to field-level officers (Ary, Jacobs, & Sorensen, 2010). NGO participants were primarily recruited through network sampling and represented USAID’s Food and Enterprise Development Program, ACDI/VOCA, ZOA, Community of Hope Agricultural Project, Farmers’ Union Network of Liberia, United Methodist Compound Agricultural Program, and 4-H Liberia. The interview guide used was developed from the literature and approved by in-country stakeholders.

Data were gathered through semi-structured interviews and direct observation. The final sample included 13 MoA personnel and 16 NGO personnel. All interviews were digitally recorded, conducted in English, and occurred primarily in personnel offices.
Additional observational data were captured in research notes, memos, and daily journaling (Creswell, 2013).

The digital recordings were transcribed following data collection. Straussian coding (Strauss, 1987) and the constant comparative method (Merriam, 1998) were used for data collection. Open, line-by-line, and axial coding were followed by selective coding, resulting in categories reflective of commonalities in the data (Strauss & Corbin, 1990). Data triangulation, member-checking, prolonged engagement, peer debriefing, thick description, and an audit trail enhanced data trustworthiness (Lincoln & Guba, 1985).

**Results**

Varying capacities of extension personnel and opportunities to develop capacity were observed. MoA officers had less formal education than their NGO counterparts and few opportunities to attend MoA-sponsored trainings. Some officers were educated pre-conflict and demonstrated a significant lack of knowledge of modern production methods. Positively, the MoA supported exemplary officers by sending them abroad to receive advanced degrees in priority areas. However, skilled officers were often drawn to better-paying international organizations (INGOs), further lessening the capacity of the MoA officer base.

Personnel working for NGOs began with higher levels of formal education but also, in some instances, received intensive pre-service training. NGO officers were also observed to have higher levels of technical and teaching knowledge versus MoA officers. The large INGOs worked to further increase their human capacity by regularly offering technical trainings often open to personnel from multiple agencies. MoA and smaller NGO officers reported attending when possible.

Technical knowledge was a constraint for many personnel, but especially for those employed by the MoA. Inclusion in INGO training did appear to provide a basic level of technical knowledge to MoA officers, although low access to up-to-date information negatively affected their ability to serve farmers. Positive interpersonal skills were demonstrated by both the MoA and NGO sector, although the MoA lacked andragogical abilities relative to their NGO counterparts. These differences resulted in low capacity of MoA officers compared to NGO officers and repositioned MoA officers as deferential to their more-capable peers, although they were partners in actually implementing programs.

**Recommendations/Implications**

Successful pluralistic extension requires increased efforts to bridge the capacity gap between MoA and NGO personnel (Swanson & Rajalahi, 2010). More importantly, the future success of extension will depend on MoA officers’ ability to develop the skills needed to lead these programs, especially as INGOs are expected to transition away from service delivery in the near future when funding levels decline (MoA, 2007, 2008). Practically, this requires the MoA to find a sustainable method of providing professional development to its officers and to cease reliance on NGO support. Without effective internal capacity building, Liberian extension will struggle to serve farmers and meet its agricultural development goals.

**References**


Chess with Feelings: Using Q Methodology to Explain Viewpoints of Change as a Result of Study Abroad

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Keywords: Q Method, Study Abroad, Namibia, Human Development, Factor Analysis

Introduction:
Study abroad programs are important (Engle & Engle, 2003), increasing (Institute of International Education, 2013), impactful (Carlsen, Bum, Useem, & Yachimowicz, 1991), and have shown positive influences in agricultural disciplines (Zhai & Scheer, 2002; Black, Moore, Wingenbach, & Rutherford, 2013). In fact, Carlsen et al. (1991) suggest that students who participate are changed. However, we do not yet have a clear understanding for how that change is manifested. How do students who participate in a study abroad program change?

Purpose and objectives:
The purpose of the study was to explain viewpoints of how students change as a result of studying abroad. Objectives were to a) conduct a Q methodological study, comprised of the Q sort collection method, and b) use factor analysis to characterize the distinct viewpoints that emerge.

Methods:
Q methodology captures the subjectivity of individuals to catch the essence of the holistic meaning-making process (Brown, 1996). Differing from traditional methods, Q methodology measures items’ performance across people, thereby using the subjective diversity of differing viewpoints to generate factor analysis (Stephenson, 1953). The central data collection component of a Q Method study is the Q-sort, where participants (the P-set) sort a series of statements (the Q-set) into a forced distribution (van Exel & de Graaf, 2005). Data are then analyzed through a process of factor extraction, factor rotation, and factor analysis (Watts & Stenner, 2012).

Qualitative interviews of 10 purposively sampled individuals who participated in a study abroad program in 2012 or 2013 were used to generate the Q-set, comprised of 45 statements describing how students change as a result of studying abroad. A small group of students of varying perspectives who participated in a study abroad in 2014 were then purposively sampled to constitute the P-set (Watts & Stenner, 2012). Participants were selected to ensure that multiple majors, classifications, gender, ethnicities, and universities
were represented in the P-set. The P-set performed the Q-sort by distributing the statements into a continuum that assigns values based on statements ranging from “Least like me” (-5), to “Most like me” (+5).

Principal Component Analysis (PCA) was used to identify factors for extraction using the Kaiser-Guttman Criterion, which relies on eigenvalues as an objective measure, as well as theoretical and practical analysis (Brown, 1980; Watts & Stenner, 2012). These factors were then conceptually rotated to magnify the similarities and differences that characterize them through a Varimix rotation (Watts & Stenner, 2012) and interpreted to define each factor as a distinct viewpoint on the topic (Brown, 1980; Watts & Stenner, 2012).

**Results:**

A three-factor solution emerged, explaining 67% of the variance in the sorts. After Varimix rotation, each factor returned high composite reliability coefficients (.88, .92, and .92, respectively). Individual q sorts with the highest factor loadings on each factor were flagged as defining sorts. Based on these defining sorts, Q-sort values and Z-scores were utilized to identify distinguishing statements that characterized each factor.

Factor 1 defined as “Confidence,” was characterized by statements such as, “I am more confident in my skills and experiences,” “I am more comfortable interacting with people I don’t know,” and “I understand my strengths and abilities better.”

Factor 2, defined as “Perspective,” was characterized by statements such as, “I relate my everyday experiences to my international ones to make sense of them,” “I realized how small I am,” and “I seek others with international experiences.” Factor 3, defined as “Teamwork,” was characterized by statements such as, “I became more patient,” “I listen more,” “I am more tolerant of others,” and “I no longer jump to conclusions.”

**Recommendations:**

Practitioners should recognize three distinct viewpoints exist regarding the way changes are manifested in students: enhanced confidence, enhanced perspective, and enhanced teamwork.

These viewpoints should be used toward the creation of a conceptual model of student development as a result of study abroad experiences.

Activities that further enhance confidence, including presentations and public showcases should be implemented. Activities centered on team-based assignments should be implemented. Deep reflection in multiple forms could foster the perspective viewpoint.

Q methodologies play an integral role in evaluating the inherently subjective elements of student development and meaning-making. Participants in this study responded positively to the additional reflection and cognitive process of sorting statements, eliciting one participant to call the process, “Chess with feelings.” Such cerebral exercises should be further implemented as both a tool for reflection and a measurement of operant subjectivity in other global learning settings.

**References**


Competence and Motivation of the Minor in Communication and Extension at the University of the West-Indies, Trinidad and Tobago.

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Keywords: Communication and Extension, Focus Groups, Purposive sampling

Introduction

“Agricultural science should be revitalized in schools and agricultural extension support and other technical services should provide scientific and technological input to transform this sector” (OECS, 2003). In recent times, the capacity of Agricultural Extension within the Caribbean Region has been steadily declining (Kendall, 2002). Within the Caribbean, the University of the West-Indies, St Augustine Campus is the only institute that offers a minor in Agricultural Extension. This institution also offers Agricultural Extension at a Masters in Philosophy and at the Post doctoral level. However, within recent years, statistics has shown a tremendous decline in students furthering the studies in extension from nineteen candidates in the 2008 academic year to eleven candidates in 2012 (CITS, 2014). Being the foundation for study and training in extension education within the Caribbean, this study entails an assessment of the competence of the programme by past students who pursued the minor in Communication and extension at the University of the West-Indies and the motivation to continue in the field.

Purpose and objectives of the abstract

This research was carried out to provide a preliminary understanding of the present extension education competency among students at the University of the West-Indies, St Augustine Campus and potential reasons for the decline in the enrolment statistics of the extension programme. The objectives were: (a) to identify reasons why students at the University of the West Indies do not pursue extension studies after completing the minor in Communication and Extension; (b) to gain an insight into the reasons why students select the minor (c) develop sustainable recommendations to encourage students to further in the field of extension education.

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

Student registration information was gathered from the university’s campus information services. Trend analysis demonstrated the enrolment status over a ten year period for the minor in Communication and Extension at the University of the West Indies. Being qualitative in nature, this study made use of purposive sampling. One focus group
was carried out coupled with a semi-structured questionnaire. The questionnaire focused on the strengths and pitfalls of the extension programme as perceived by the sampling unit. Participants were carefully selected from the enrolment of students within the agricultural field that had completed the minor in Communication and Extension. The data was categorized and coded into the Statistical Package for Social Sciences (SPSS). With the use of participant quotations and graphical illustrations, the viewpoints of the sample were reported.

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

Responses from participants showed an even distribution related to the reasons individuals selected this particular field. With limited or no prior knowledge of the field, participants had engaged in extension studies; (1) to attain credits to complete their major, (2) viewed the programme as less challenging or (3) to qualify to gain entry into the graduate programme. Of the sampling population, fifty seven percent furthered some form of extension work or study, citing their developed passion for the field as the reason. The remaining forty three percent opted out of the field resulting from the inability to gain employment. Outcomes revealed of the nineteen candidates graduating from the minor in Communication and Extension, in the 2008/2009 academic year, only two students sought to continue to the Masters in Philosophy of Agricultural Extension. Similarly, of the eleven students reading for the minor in the 2011/2012 academic year, two students continued to the graduate level. Lessons learnt comprised how to develop extension programmes and varying methods of communication.

Results revealed that students viewed the programme as engaging and practical with innovative teaching strategies. However, limited linkages with the local extension sector and lack of specialization in the field were seen as shortcomings.

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

Emerging from the study, creating awareness of the programme was suggested as a viable option for increasing enrolment at the tertiary level. The incorporation of field work and the implementation of specializations such as sociology, crop science and rural development within the programme would increase the marketability of the individual. The formation of a major at the undergraduate level would enhance interest in the field whilst; a Master of Science in Agricultural Extension would encourage more individuals to engage in the programme.

**References**


Describing the Dimensions of International Educational Experiences Offered in Colleges of Agriculture in the United States

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Keywords: International, Experiences, Study abroad, Global education

Introduction
In response to industry demands for globalized employees, land grant institutions around the nation are placing a priority on the internationalization of the curriculum (National Research Council, 2009). Many colleges of agriculture are seeking ways to better integrate an international component into their current offering (Irani, Place, & Friedel, 2005). While many value the general idea of generating a globally minded student, many fail to see how integrating international experiences will fit within their curriculum (Navarro & Edwards, 2008). Insight is needed from engaged scholars to help advance this cause.

Purpose
Using Roberts’ (2006) model of experiential learning contexts, this study explores current practices in international education. Such an exploration can provide guidance for educators wishing to internationalize their educational efforts. The objective of this study was to describe the scope and context of international educational experiences based on their duration, setting, intended outcome and level of cognitive engagement.

Methods
This was a basic qualitative study (Ary, Jacobs, & Sorenson, 2010). The population for this study was faculty in colleges of agriculture in the U.S. Snowball sampling was used to select 24 participants. The initial ten participants were selected based on their publications in the Journal of Agricultural Education and Journal of International Agricultural and Extension Education. Interviews were conducted until data saturation was met. All interviews were audio recorded and transcribed verbatim to increase dependability. Supporting documents, such as course syllabi, were analyzed for triangulation to improve credibility (Dooley, 2007). Analysis was conducted using the constant comparative method (Ary et al., 2010).

Results and Conclusions
Participants included seven females and seventeen males. Four held the rank of assistant professor, eight were associate professor, eleven were full professors, and one was
a staff person who coordinated international programs. Additionally, four participants were assistant/associate deans. Disciplines of participants included: agricultural education, communication and extension; entomology; rural sociology; wildlife and fisheries; plant sciences; agricultural economics; and international agriculture. Representative institutions were geographically dispersed across the United States. Faculty indicated five major types of experiences: (a) curricular experiences, (b) seminars, (c) interactions with international students, (d) co-curricular and extracurricular activities, and (e) international travel. A list of specific international experiences is provided in Table 1 based on Roberts’ (2006) model.

### Table 1.
**Scope and Contextual Dimensions of International Educational Experiences**

<table>
<thead>
<tr>
<th>Experience</th>
<th>Level</th>
<th>Duration</th>
<th>Intended Outcome</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using pictures and videos in class</td>
<td>Abstract</td>
<td>Minutes to Hours</td>
<td>Exposure</td>
<td>Formal</td>
</tr>
<tr>
<td>Using case studies in class</td>
<td>Abstract</td>
<td>Minutes to Hours</td>
<td>Exposure</td>
<td>Formal</td>
</tr>
<tr>
<td>Using scenarios in class</td>
<td>Abstract</td>
<td>Minutes to Hours</td>
<td>Exposure</td>
<td>Formal</td>
</tr>
<tr>
<td>Using guest speaker(s) in class</td>
<td>Abstract</td>
<td>Minutes to Hours</td>
<td>Exposure</td>
<td>Formal</td>
</tr>
<tr>
<td>Using reusable learning object (video or pictures) in class</td>
<td>Abstract</td>
<td>Minutes to Hours</td>
<td>Exposure</td>
<td>Formal</td>
</tr>
<tr>
<td>Using current world events in class</td>
<td>Abstract</td>
<td>Minutes to Hours</td>
<td>Exposure</td>
<td>Formal</td>
</tr>
<tr>
<td>Relevant examples from a more “internationalized” instructor’s perspective</td>
<td>Abstract</td>
<td>Minutes to Hours</td>
<td>Exposure</td>
<td>Formal</td>
</tr>
<tr>
<td>Seminars</td>
<td>Abstract</td>
<td>Minutes to Hours</td>
<td>Exposure</td>
<td>Non-formal</td>
</tr>
<tr>
<td>Individual international course</td>
<td>Abstract</td>
<td>Months</td>
<td>Exposure</td>
<td>Formal</td>
</tr>
<tr>
<td>Completing a certificate in international agriculture</td>
<td>Abstract</td>
<td>Years</td>
<td>Exposure</td>
<td>Formal</td>
</tr>
<tr>
<td>Completing a minor in international agriculture</td>
<td>Abstract</td>
<td>Years</td>
<td>Participation</td>
<td>Formal</td>
</tr>
<tr>
<td>Completing a major in international agriculture</td>
<td>Abstract- Concrete</td>
<td>Years</td>
<td>Internalization</td>
<td>Formal</td>
</tr>
<tr>
<td>Completing a dual title degree program with international agriculture</td>
<td>Abstract- Concrete</td>
<td>Years</td>
<td>Dissemination</td>
<td>Informal</td>
</tr>
<tr>
<td>Interacting with international students</td>
<td>Concrete</td>
<td>Minutes to Hours</td>
<td>Participation</td>
<td>Informal</td>
</tr>
<tr>
<td>Clubs</td>
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### Recommendations

#### Recommendation for practice

1. Instructors seeking a relatively easy way to begin offering an international perspective may find some of the lower level suggested experiences a good place to start, such as inviting a guest speaker or introducing an article from an international journal. Seasoned practitioners may seek more advanced programming to offer students such as offering a short term research or internship abroad.

2. Seek out opportunities for professional development with an international focus.

#### Recommendation for future research

1. Identify reasons why students participate in short and medium term international travel.
2. Determine if less intense experiences are predictive of longer-term intense experiences.
3. Use a measure of global mindedness to examine outcomes of the identified experiences.

### References


Determinants of the Entrepreneurial Success of Young Nigerian Agricultural Entrepreneurs: Implications for Agricultural and Extension Education

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Introduction
Nigeria faces a dire demographic challenge. Of its current 170 million population, over 40% falls with the age range of 0-14 years (CIA, 2011). By 2050 Nigeria’s population is projected to balloon by 176% to 402 million making it the fourth largest in the globe (UN, 2011). Nigeria also has a debilitating high youth unemployment rate estimated as high as 60% (Adawo, Essien & Ekpo, 2011). Consequently, youth agro-entrepreneurship development has become a cornerstone of the country’s aggressive agricultural and economic transformation agenda (Adesina, 2014). One of the major issues in youth entrepreneurship development across the globe is the high failure rates estimated as high as 80% (Alonge and Tejeda, 2012 and Wallace, 2014). Consequently, understanding the determinants of the success or failure of Nigerian youth agro-enterprises is both an economic and existential imperative.

Three broad domains have emerged in the entrepreneurship success literature. The entrepreneur trait model postulates that entrepreneur success or failure is predictable based on intrinsic personality traits of the entrepreneurs including risk tolerance and need for achievement (Louw et al. (2003). The management and organization structure domain looks at the management and organizational structures of enterprise while the third domain focuses on the exogenous macro-entrepreneurship ecosystem related to government policies and business infrastructure as determinate of business success or failure (Porter et al., 2002). Agricultural and extension education lags behind in agro-entrepreneurship research and development (Glenn et al, 2009).

Statement of purpose
The purpose of the study was to determine contributory factors and constraints to the success or failure of selected young Nigerian agro-entrepreneurs from across the country who received agricultural start-up grants under the Nigerian government Youth Enterprise with Innovation in Nigeria (YOUWIN). The YOUWIN program is a multiagency youth entrepreneurship development program funded by the Nigerian government in which 1200 youths are selected to receive up to ten million Naira ($1=N160) based on a business plan competition (Federal Ministry of Finance, 2012). Specifically, the study developed a multivariate model consisting of the three prominent domains in entrepreneurship research of entrepreneurs’ psychological and demographic, firm level characteristics and exogenous entrepreneurship ecosystems factors (Bensing,
Chu, and Kara, 2009), to assess the most significant determinants of the failure and success of youth agricultural enterprises in Nigeria.

**Methodology**

The study adopted a descriptive research framework. The study population consisted of participants in the US State Department Nigerian Young Entrepreneurs exchange program (2009-2011) and the Federal Government of Nigeria YOUWIN program. A random sample of 250 participants was selected from program databases. Data collection included an online questionnaire survey and other secondary data sources including, anecdotal observations, project documents and self-reports. A response rate of 75% and an acceptable data reliability coefficient of over .80 (Nunnaly, 1978) were reported. SPSS descriptive and inferential statistical tools were used in data analysis.

**Findings & Conclusions**

1. Respondents were predominant male (75%), college educated (98%), prior entrepreneurship education (10%), with a mean age of 28 years and less than five years business experience.
2. The distribution of respondents by agricultural enterprise sectors were as follows: livestock and aquaculture operation (45%), crop production (25%) agro-processing 15%, agricultural services and supplies (5%). Poultry operation was the dominant agro-enterprise.
3. The study population evidenced a high proportion of necessity entrepreneurs, meaning entrepreneurship was not the first choice, but a necessity due to factors such as limited opportunity for employment in the formal sector.
4. Most significant predictors of entrepreneurs’ success or failure included: entrepreneur commitment, education, enterprise management skills, access to business mentors, perceptions of and attitude towards entrepreneurship ecosystems constraints.
5. Respondents identified poor of access to extension services, lack of entrepreneurship education, poor physical and market infrastructure, unconducive government policies and difficulty obtaining loans as major factors in enterprise failure.

**Recommendations & Implications**

Government efforts to promote youth agro-entrepreneurship development must be constructed with an integrated development approach built on a preference for committed and innovative over necessity entrepreneurs, investment in human capital through integration of agro-entrepreneurship education programs in the formal education sector, continuing mentorship for new start-ups, and the creation of a supportive macro-economic ecosystem for entrepreneurship development.

If agricultural and extension education is to remain a major player in agricultural development in the developing world, the profession must integrate an entrepreneurial orientation in its program planning and service delivery. Pre-service and continuing education curricula for extension educators must include relevant courses in entrepreneurship education.

**References**


Does Farmer-to-Farmer Extension Increase Women’s Participation and Access to Advisory Services? Lessons from Kenya, Cameroon and Malawi

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Keywords: Gender, Africa, Agricultural Extension, Innovation, Participation

Introduction

Gender balance in agricultural extension is a key problem noted by many observers (World Bank, FAO & IFAD, 2009; World Bank, 2012). The two related issues usually mentioned in this regard are that women make up only a small proportion of extension staff and women farmers have less access to extension than men farmers. Farmer-to-farmer extension, “the provision of training by farmers to farmers, often through the creation of a structure of farmer trainers” (Scarborough, Killough, Johnson & Farrington, 1997) is a common extension approach throughout the tropics (Masangano and Mthinda 2012; Wellard, Rafanomezana, Nyirenda, Okotel &Subbey, 2013). Numerous studies of farmer-to-farmer extension have documented the approach’s advantages, such as its cost-effectiveness, its sustainability, its promotion of farmer innovation, and that farmers often learn more effectively from their peers than from extension agents (Hellin & Dixon, 2008; Amudavi, Khan, Wanyama, Midega, Pittchar & Nyangau, 2009; Lukuyu, Place, Franzel & Kiptot, 2012. Others have noted the approach’s limitations, for example, that it is less appropriate in low population density areas, and for complex, risky practices (Kiptot,
Franzel & Kirui, 2012). However, no study was identified that assessed the approach’s effect on gender balance.

**Purpose and Objectives**

This paper assesses whether the farmer-to-farmer extension approaches help organizations to increase the proportion of women (staff and farmer trainers) providing extension services. It also examines whether female farmer trainers train more women than do male farmer trainers.

**Methods**

Representatives of 80 organizations using F2F extension were interviewed (30 in Kenya and 25 in Cameroon and 25 in Malawi) in 2013 using the snowball sampling method. Extension managers using farmer-to-farmer extension were interviewed and respondents directed interviewers to other potential respondents (Goodman 1961). Organizations included government, non-governmental organizations, farmer organizations and private companies. Interviews were also conducted in 2013 with 160 randomly selected farmer trainers in Cameroon and 203 in Malawi.

**Results**

If the proportion of women among farmer trainers is higher than the proportion among field staff then farmer trainers can be said to help increase the proportion of women providing extension services. Results on this are mixed. In Kenya, the proportion of lead farmers who were women was 43% while the proportion of field staff who were women in the same organizations was only 33%. Thus the proportion of women extension providers among lead farmers was 30% higher than the proportion among field staff. In Cameroon, farmer trainers had less of an effect on gender balance, as the proportion of women among lead farmers was 30% while the proportion of women among professional staff was 28%. In Malawi, farmer trainers had no overall effect as the proportion of women among farmer trainers, 37%, was the same as the proportion of women among the field staff of the organizations interviewed.

In certain organizations, volunteer farmer trainers had a dramatic effect raising the proportion of women providing extension services, as they found it easier to recruit female farmer trainers than to hire female field staff. For example, in the East African Dairy Development (EADD) Project. Kenya less than 10% of the professional trainers were women whereas 25% of the 852 farmer trainers were women. In the Ministry of Agriculture, Malawi, 40% of the 12,000 of the volunteer farmer trainers are women while 21% of the field staff are women.

Concerning the numbers trained, farmer trainers in Cameroon trained on average 58 farmers (median, 17) and those in Malawi 61 farmers (median, 25) over the past year and there was no significant difference in numbers trained between men and women in either country. But women trained far more women than men did. In Cameroon, women made up 74% of farmers trained by women while they made up only 41% of those trained by men (p<.01). In Malawi, women made up 62% of those trained by women and 55% of those trained by men (p<.012).

**Implications**
In addition to being cost effective in many circumstances, an important but neglected advantage of farmer to farmer extension programs is that they can often help organizations to increase the proportion of women providing and accessing extension services. Policy makers interested in increasing the proportion of women providing and accessing extension services should consider adopting farmer to farmer extension approaches as it is often easier to recruit female volunteer farmer trainers than to recruit female extension workers.

References


Does Gender and Other Social Factors Matter in Farmer Knowledge Acquisition? Evidence from IPM for Coffee Pest Management Learning Groups

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Keywords: Gender, IPM knowledge, Coffee stem borer

Introduction:
Integrated Pest Management (IPM) is a knowledge intensive technique for cost-effective environmentally friendly management of agricultural pests (Morse and Butler, 1997; Yang et al., 2008). IPM adoption depends on a number of factors that determine both the extent and intensity of use of the practices. IPM practices have been promoted for the management of a new Coffee Stem Borer (CSB) in Eastern Uganda (Kyamanywa et al., 2011). Although empirical evidence shows that socio-economic factors are important determinants of farmers’ adoption decisions (Bonnabana-Wabbi, 2002), few studies especially in Uganda and for CSB IPM technologies have explored the factors that affect IPM knowledge despite it being a pre-requisite to any adoption decision. For example, elsewhere, gender has been found to influence group participation and IPM technology use in various countries (Subedi, 2008; Malena, 1994). However, the extent to which gender affects knowledge acquisition during group training and application has not been fully explored (Price, 2001). In addition, the effect of various socio-economic factors on IPM learning deserves further elucidation, given the diverse contexts, dynamism and site specific nature of gender and IPM (Roling and Jiggins, 1998).

Purpose and objectives of the abstract:
The purpose of this paper is to examine socio-economic factors influencing farmers’ learning. Specifically, the paper describes the level of men and women farmers’ knowledge of Coffee Stem Borer IPM practices and the socio-economic factors that influence farmers’ knowledge acquisition in Bugisu, Eastern Uganda.

**Methods and data sources:**
A post training cross sectional survey of a purposively selected sample of 71 men and 55 women members of coffee IPM groups who had participated in a training on coffee stem borer (CSB) IPM under a USAID funded IPM Innovation Labs project was conducted. The level of IPM knowledge was measured using a knowledge index computed by summation of farmers’ scores on a 9 item test. An independent t-test was used to compare the difference in knowledge levels of men and women farmers. An ordered Probit model was used to analyse the factors influencing men and women farmers’ IPM knowledge after the intervention.

**Results and conclusions:**
It was found that men had a significantly higher mean scores on the IPM knowledge index compared to women. In addition, there was a significant correlation between knowledge of CSB IPM and gender, educational level, marital status, household labor, coffee acreage, years in the coffee group, access to transport, women’s mobility, and level of participation in group activities. The factors that significantly influenced farmer knowledge of CSB IPM included gender, age, number of extension farm visits, membership in other farmer groups. Older men who had more network connections with community groups and access to the IPM CRSP extension agents attained more knowledge about CSB IPM practices. Knowledge was enhanced when group trainings were complemented with more personal extension methods such as on farm visits by the IPM CRSP agent. Social groups such as women, youth, and those with fewer community network connections lagged behind in CSB IPM knowledge levels.

**Recommendations, educational importance and implications:**
The fact that knowledge was enhanced when group trainings were complemented with more personal extension methods suggests that coupling a number of gender sensitive strategies is important in achieving the desired equity outcomes. In addition, the fact that social groups with limited access to the IPM CRSP extension agent lagged behind other groups suggest that special targeting of these groups is necessary so as to address their unique needs. There is need for ways of enhancing women’s ability to gain more CSB IPM knowledge. For women, knowledge acquisition on a male controlled cash crop like coffee would be enhanced through complementarily gender transformative efforts aimed at eliminating gender based barriers to their participation in learning groups arising from their subordinate position to men. This requires innovative educational strategies targeting men’s attitude towards coffee control issues and the need allow women to have control so as to optimize women’s participation in CSB management.

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Employing an Outcome-Based Extension Education Model to Communicate and Reduce the Risks Associated with Highly Hazardous Pesticide Use in West Africa

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Introduction

Smallholder farmers in West Africa have access to numerous highly hazardous pesticides through informal and formal markets. The risks associated with use of these pesticides are among the highest that have ever been documented. Across five countries, significant threats to human health, aquatic life and terrestrial wildlife have been measured (Jepson et al., 2014). Although a regional regulatory system is in place throughout West Africa it is not enforced, and farmers lack access to the education that would be required for effective risk management. We have adapted an outcome-based education (OBE) model for pesticide risk reduction in West Africa that was first developed and tested in the Western United States (Halbleib & Jepson, 2014). This education model incorporates participatory program design and engagement, but adds a process that adapts and refines sophisticated, science-based tools to provide the information that farmers need to make rational risk management decisions. We report use of this system with farmers in Western Senegal.

Purpose and objectives

The purpose of this program is to reduce or eliminate risks posed by highly hazardous pesticides to human health and the environment. Our objectives are: 1) to adapt and test an OBE model to fit within the West African smallholder farmer context, 2) to carry out locally-relevant risk assessments that identify the key risk reduction behaviors that can protect farming families, water resources and domesticated animals, and 3) to establish a West African regional task force that can scale-up risk communication to meet needs across the Senegal and Niger River Basins.

Methods, data sources and philosophical themes

Our initial pesticide risk dataset comes from a Global Environment Facility funded program, coordinated by the UN FAO in the Senegal and Niger River Basins in West Africa (Jepson et al., 2014). The analyses derive from surveys conducted in 2007
and 2010 by program coordinators in five countries. These coordinators were also responsible for a program of farmer field schools (Settle et al., 2014) and they are skilled educators. The discovery of very high levels of pesticide risk created the challenge of designing a risk communication and reduction education program that could reduce pesticide impacts.

A West African regional pesticide risk reduction task force has been established, and initial steps in OBE design were undertaken in 2013 with West African coordinators. In early 2014 we developed a program outcome guide (POG) with community members in Diender, Senegal, and regional experts. This provided the logical framework for an educational intervention in April 2014. We formulated a program that combines state-of-the-science risk assessment modeling with information from focus groups and consultations with farmers. These consultations determined chemical use patterns and rates, and the risks associated with these were calculated and fed back to the education program. These data were incorporated into social learning activities that allowed farmers with low literacy to consider viable options to reduce risk. This program is in compliance with the Oregon State University Institutional Review Board.

Results, products and conclusions

Farmers in Diender have been using organophosphate and carbamate insecticides with no risk management education or support, and we have calculated detailed risk profiles for the use patterns that they have reported to us. The POG (Halbleib & Jepson, 2014) development process incorporated the priorities of the community, and also reflected the nature of risks that we were able to calculate. The intervention used a novel methodology, based upon the constructivist paradigm that supported farmers to develop a realistic timeline of seasonal crop management based upon their own farms. This enabled them to visualize the interaction between themselves and family members, conducting farm tasks, and pesticides that they had applied, which could persist on crop foliage at toxic levels for up to three weeks. A new system of pictograms was developed to portray risks to farmers who could not read, and they developed risk reduction recommendations for themselves, guided by local facilitators. Follow-up surveys in the months following the intervention have shown that farmers communicated risks and risk reduction strategies to other community members, but they also preferred risk elimination, selecting lower toxicity pesticides altogether.

Recommendations, educational importance, implications and applications

Short-term, locally adapted interventions, built using a participatory education program-planning model can successfully limit pesticide risks in a smallholder farm setting in West Africa. The key attributes of this model are its portability and adaptability, and the degree to which sophisticated risk assessment models can be incorporated within the process to isolate real risks, and avoid blanket statements of risks that are overgeneralized and impossible to apply.

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Empowering Women’s Groups to Access Agricultural Extension and Training Through Peer-To-Peer Training and Social Capital Building in Jordan

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Keywords: Women’s group, Social capital, Targeted skill-set training, Extension services, Jordan

Introduction
Jordan is a small Middle Eastern country with 7.9 million people. Agriculture contributes 3.1% to country’s GDP while it employs 62.2% of women out of total 6.3% of the economically active population in agriculture (CIA, 2014; FAO, 2011). At a household level, Jordanian women contribute to commercial farm labor as well as grow their own crops in home gardens for family consumption. Despite their critically important roles in agriculture, women often lack access to extension services and training that could increase their agricultural productivity and enhance rural livelihoods. There are a multitude of reasons for this, varying from low literacy levels among rural women, the lack of female extension agents and appropriate extension materials, to the lack of appreciation for women’s roles in agriculture. Women are additionally constrained by the traditional and cultural “space-based patriarchy,” which precludes their free movement in the public sphere to access information and participate in decision-making (Sidiqi & Ennaji, 2010). This is especially acute in rural areas where women often lack a culturally acceptable ‘safe’ space to participate in dialogue and must rely on male relatives for agricultural information and production-related decisions.

A number of approaches have been identified to increase women's access to, and participation in, extension services and training. One promising approach is based on working through women’s groups such as cooperatives or community-based organizations. These groups can help mitigate the taboo associated with women engaging in the public sphere beyond what has been traditionally accepted. Participation in a women’s cooperative, the activities of which are often related to women’s activities, can generate support within the community through collective action and the pooling of resources. For this approach to succeed however, two things are necessary: strong cooperatives and capable, confident women.
Purpose and Objectives

The purpose of this study was to identify how building social capital and enhancing women’s agency can empower individual women to strengthen their groups. Previous research with farmer groups in Bolivia, India, and Uganda demonstrated that groups with multiple skill sets possess strong agency, which empowers the rural poor to enter markets (Ashby, et al., 2011). The main objectives of our study included identifying 1) strategies that develop social capital bonding within the group or facilitate group construction where a cohesive climate is lacking, 2) participatory training methods that build women’s confidence and social capital, while strengthening their internal and external network connections, and 3) ways to strengthen cooperative agency to empower women to be change agents.

Methodology

Our research was conducted alongside a training program implemented by Jordan’s National Center for Agricultural Research and Extension in three women’s cooperatives. Data was collected using focus groups, direct observations, and social network analysis from training and non-training participants representing three cooperatives. Women also completed a baseline survey developed to determine their knowledge in the five skill sets (group management, marketing, savings and fund-raising, technology and innovation, and natural resource management) as well as the level of their participation in the cooperative and community affairs.

Results

The training program combined with peer-to-peer mentoring provided an opportune environment for women’s social capital development and network-building given both the frequency of workshops and richness of training material. We observed that women’s membership in the cooperatives appears to help them overcome cultural barriers to participation while increasing their access to extension services. Women regarded their participation in the cooperative important for personal development and confidence building, specifically noting a greater sense of purpose from building valuable relationships within the cooperative and being a part of the community. The participatory methods, such as small group discussions, sharing personal opinions and peer-to-peer support helped women build their confidence and leadership skills, which are critical to the advancement of women in the public sphere. Women praised the learning-by-doing approach and specifically noted how helpful it was to engage with each other and practice speaking in public and sharing their opinions openly with others.

Recommendations

Utilizing participatory targeted skill-set training and peer-to-peer mentoring for social capital building among women’s groups is an effective way for extension planners to increase the groups’ strength and social cohesion, which are necessary to successfully implement extension programs in Jordan. Increased training of extension agents in gender-specific methods, working directly with women’s groups and scheduling trainings or meetings at times when women can participate are simple and effective in delivering extension training and information. Further research is needed to understand how women’s groups, as models of social enterprise, can utilize social capital to advance their collective action.
References:


Engaging Youth and Strengthening Rural Communities in Costa Rica

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Keywords: Rural youth development, Rural community development, International

Introduction

The future of rural communities rests squarely upon the shoulders of today’s youth who will serve as the community leaders of tomorrow. In spite of the need to engage youth in preparing their communities to thrive, youth in Latin America are routinely overlooked or, worse, frequently seen as problematic, difficult, and creators of conflict rather than creators of solutions (UNICEF, 2008). Many rural youth abandon their communities of origin, opting to try their luck in busy urban centers in their respective countries. Instead of finding a future, these youth find worse problems in the cities, including violence, abuse, disease, drugs, and death (UNICEF, 2008).

Engaging youth in their home communities in ways that provide them with positive developmental experiences could serve as a measure to stem the tide of urban migration (Renteria, 2013), as well as highlight the value of youth to the community. One method of rural youth engagement in Latin America is the use of 4-S Clubs (similar to 4-H Clubs in other countries).

Purpose of the Research

The purpose of this mixed-methods research was to examine the connection between youth engagement in 4-S clubs and the positive development of youth and their contributions to the development of community capital in rural Costa Rica.

Methods

This study used a sequential exploratory mixed-methods approach to understand how youth perceived their experiences in 4-S in terms of positive youth development and to measure the effect of youth engagement on the community through assessing youth’s contributions to the development of community capital.

Phase 1 of the study included semi-structured interviews with the country and regional directors of Costa Rica 4-S to understand the 4-S methodology and how it was used to engage rural youth in developing community capital. Data was analyzed and coded for themes relating to youth development and the development of community capital as defined by Emery and Flora (2006). The results were used to guide the development of focus group discussions in phase 2.
Phase 2 of the study consisted of observing the 28 participating 4-S clubs in action and informally interacting with participants in order to gain information on their views of youth in the community. These casual encounters, with data from phase 1, contributed to the development of material for focus group discussions on youth development and engagement at each of the 28 clubs. Rural youth identified characteristics and capacities they possess which benefit their communities based on a protocol for the analysis of community capital (Bautista, et al, 2012). They then demonstrated where each of these characteristics and capacities falls in the development of community capital. Data was analyzed and coded for themes relating to youth development and community capital development. The results were used to create a survey on positive youth development.

The third phase of the study was the collection of survey data from both 4-S and non-4-S rural youth in the 28 participating communities. The 26-item survey instrument included items from the Positive Youth Development Scale (Lerner, et al, 2005) that were appropriate for the rural Costa Rican context. The survey was administered to 544 randomly selected youth (311 = 4-S; 233 = non-4-S) across the 28 rural communities. The youth development items were collapsed into 2 indexes – positive youth development and resilience. ANOVA tests were conducted to compare differences in means between 4-S and non-4-S groups.

Results

The results of the qualitative research conducted in phases 1 and 2 indicated that the primary focus of Costa Rica’s 4-S clubs was on youth engagement for rural community development. The national and regional directors all underscored this belief in their interviews. Youth in the 28 participating clubs also believed that their engagement was of critical importance to their communities. They expressed that 4-S provided them with opportunities to take on leadership roles and make a difference in their communities through collaborative projects. They identified their contributions to all of the community capitals and saw themselves as an integral part of their communities’ ability to thrive.

The results of the quantitative research conducted in phase 3 indicated that 4-S youth were more connected to their communities, demonstrated more positive development, and more resilience than non-4-S youth, thus strengthening the results of the qualitative data.

Conclusions and Recommendations

Engaging rural, Costa Rican youth in 4-S clubs has a positive impact on their development and the development of capital within their communities. Continued evaluation of 4-S will serve as the basis for a model of rural youth engagement for the Latin American context.

References


Enhancing Competencies in Future Extension Practitioners: The Influence of Critical Thinking, Engagement, and Self-Directed Learning on Future Change Agents

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Keywords: Critical thinking, Engagement, Self-directed learning, Change agents, Followership

Introduction
Understanding the factors that influence students’ learning in the classroom is imperative when creating curriculum to train competent agents of change, both domestically and internationally (Shinn, Wingenbach, Lindner, Briers, & Baker 2009). Change agents should be able to actively engage in their environment and with their followers, think critically, and be self-directed in solving problems (Rogers, 2003). By focusing on the student (follower), this study will give insight on critical thinking, engagement, and self-directedness to educators (leaders) who are training agents of change and add to the empirical knowledge of followership styles from a domestic (US) university and a Caribbean university and how it connects to students’ learning.

This study used Grow’s (1991) theoretical framework of self-directed learning and Kelly’s (2008) followership model to assess student-learning attributes. Grow (1991) postulated there are four stages of self-directed learning moving from dependent to self-directed and Kelly (1992) suggested two dimensions of followership: critical thinking and engagement. Having an understanding of how followership types affect levels of self-directed learning will increase the ability of educators to increase levels of self-directedness and produce students who are more likely to be effective and competent change agents.

Purpose of Study
The purpose of this study was to assess undergraduate agricultural students’ levels of critical thinking, engagement, level of followership, and level of self-directed learning at [universityA] and [universityB]. The study sought to:

1. Describe students’ levels of followership, critical thinking, engagement, and self-directedness;
2. Examine the effects of critical thinking and engagement on students’ level of self-directedness.
Methods

The population of this study was undergraduate students \((N = 400)\) enrolled in agricultural courses at [universityA] \((n = 200)\) in the Caribbean and [universityB] \((n = 200)\) in the United States. A combined 28-item instrument including Kelly’s (1992) Followership Style Questionnaire, and questions related to students’ personal characteristics was used to collect data. The Followership Styles Questionnaire utilized a seven-point summated scale with anchors: 7 = Almost Always, 5 = Occasionally, and 1 = Rarely (Kelly, 1992). Constructs of the Followership Styles Questionnaire were calculated ex post facto. Critical thinking earned a reliability coefficient of .94 and engagement .91.

The Tailored Design Method for developing and distributing an electronic questionnaire was employed for this study (Dillman, Smyth, & Christian, 2009). One hundred fourteen \((n = 114)\) participants from [UniversityA] and one hundred nineteen \((n = 119)\) from [University B] responded, yielding a response rate of 58%. Nine responses were deleted due to incomplete information, and the resulting 224 responses were utilized in statistical data analysis.

Results and Conclusions

The majority of participants from both institutions were Yes-Person followers \((n = 128, 57\%)\) indicating students did not challenge traditional guidelines of the faculty and the university. The second largest group of participants were Sheep Followers \((n = 43, 19\%)\).

Overall scores for students’ critical thinking at [universityA] were \(M = 4.33, SD = .72\), and [universityB] were \(M = 4.39, SD = .79\). The data suggested students had minimal critical thinking competence. Overall scores for students’ engagement at [universityA] were \(M = 5.41, SD = .83\) and [universityB] were \(M = 5.46, SD = 88\). The results indicated students’ were occasionally engaged in course content. Participants at [universityA] had self-directed learning levels of 2.6 and participants at [universityB] had self-directed learning levels of 2.5. The results indicated students’ were occasionally engaged in course content. It can be concluded agricultural students from both institutions are very similar in their critical thinking and engagement.

There was a significant difference for critical thinking, \(t(68) = 4.17, p < .05\) and engagement, \(t(68) = 5.03, p < .05\), and students’ self-directed learning levels. The effect size was medium \((d = .59)\). It can be concluded students’ engagement and critical thinking level influences self-directed learning.

Recommendations/Implications/Educational Importance/Impact on the Profession

Many researchers in international agricultural and extension education have established the need for programs to train students who have both technical and professional competencies and who can proactively problem solve to aid in the change process (Shinn et al., 2009; Strong & Harder, 2011). Increasing critical thinking, engagement, and self-directness is key in creating students who are able to be effective change agents (Grow, 1991; Kelly, 2008; Rogers, 2003). The profession can learn from this holistic picture of students and begin to research impacts in changes of teaching style, methods of evaluating learning, and classroom activities to increase students’ abilities to be competent and excellent as change agents in extension education.

References


Essential Questions to Guide Global Learning Experiences

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Keywords: global education, school-based agricultural education, Korea, essential questions

Introduction
School-based agricultural education (SBAE) has a role in “globalizing” future agriculture professionals. For decades, the profession has conducted research on internationalizing secondary school agricultural education programs (Ibezim & McCracken, 1994; Harbstreit & Welton, 1992; Davis, 1989; Peuse & Swanson, 1981). The National Council (2011) identified preparing globally-minded teachers as one of seven “pillars” needed in globalizing SBAE. Increasing the global competency of teachers and teacher candidates brings topics related to global agriculture into the classroom, increases opportunities for global engagement, and develops empathy for students from varied backgrounds (Foster, Rice, Foster & Barrick, 2014).

Purpose and Objectives
The purpose of this qualitative study was to investigate the use of essential questions in guiding agriculture education teachers and teacher candidates in developing global knowledge as part of a study abroad program. The objective for this part of a larger study was to identify the extent participants could provide responses to essential questions related to the agriculture, agricultural education, and culture of host country.

Methods
“School-based agricultural education across the globe: An agricultural education study abroad experience in Korea” was co-taught at [universities] in 2014. The travel portion was funded in part by Fulbright-Hays Global Projects Abroad. Essential questions guided the program, serving as cues for students to record thoughts. Wiggins and McTighe (2006) indicate that essential questions: cause genuine inquiry; provoke new understandings; require students to justify their ideas; spark meaningful connections with prior learning; and create opportunity for transferring knowledge.
Results and Conclusions

The 16 participants (eight teachers, eight teacher candidates) provided responses to 19 essential questions that guided the in-country experience. Following are examples for selected essential questions.

1. How do U.S. and Korean Agricultural Education Programs compare?
   Both programs realize the importance of hands-on education and have qualified teachers who are passionate about agriculture. There is more lecture-based learning in Korea.

2. How are teacher candidates the same/different in Korea and the U.S.?
   Teacher candidates are the same in a few ways: they don’t always know what they want to do with their degree, and they describe similar reasons for their motivation to become teachers. They also differ: Korean interns don’t student teach as long as U.S. interns; Korean interns participate in hands-on skill development instruction along with an emphasis on leadership development; and Korean students prepare for one national certification exam that determines whether they are employed.

3. How does language affect how we view other people and cultures?
   This trip made us greatly appreciate communication and other cultures.

7. How do secondary school students in Korea compare to students in the U.S.?
   Korean students see the importance of education and live up to the expectations that their parents, schools, and society places on them.

9. What similarities/differences exist between U.S. and Korean agricultural history and development?
   Agriculture has played a major role in the development of both countries. One major difference is the use of biotechnology for food production. In Korea, consumers have voiced that they do not want genetically modified foods. They value organic production.

13. How does the fair trade agreement affect Korean agriculture?
   Koreans have greater access to more worldly products at a better price.

17. How do Korean and U.S. “SAE” programs differ?
   Korean students do not have an awards system like FFA proficiency awards. Korean students do their SAE’s as a student-based project at school; many U.S. students do their SAE projects at home or at a job.

18. What are key initiatives/concerns in the Korean education system?
   Key initiatives in the Korean system are shifting students toward “employability first, university later,” incorporating liberal arts, practical arts, and sciences into curricula, creating safe schools, and creating globally competent students.

19. What should be the key messages we share after we return to the U.S.?
   We need to think more globally. It is extremely beneficial to see other cultures, try their language and food, learn about their traditions, and meet new people.

Implications and Recommendations

Global agricultural education study programs can be enjoyable and educational. To ensure course objectives are met, students should be provided with essential questions that guided course development. Participants were able to digest four weeks of information into appropriate responses, providing evidence that the program was more than a “study tour” highlighting only tourist attractions. Participants, as current or future teachers, are expected to
utilize in their classes what was learned. Future global learning programs in agricultural education should utilize essential questions in guiding learning experiences.

References
Every Practitioner a “Knowledge Worker”: Promoting Evaluative Thinking to Enhance Extension Evaluation Capacity

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Keywords: program evaluation, evaluation capacity building, organizational learning, critical thinking

Introduction

In the past decade, program evaluation has steadily gained importance in contexts of international agricultural and extension education. Funding agencies increasingly call for impact evaluations and evidence-based programs, part of a heightened focus on accountability (Savedoff, Levine, & Birdsall, 2006). Concomitantly, beneficiaries of development programs have articulated a need for accountability on the other side of the equation—ensuring that development initiatives meaningfully respond to their realities (e.g., Anderson, Brown, & Jean, 2012). More generally, extension program administrators and implementers realize more and more the need to systematically gather better evaluative information to improve their programs and use limited resources wisely.

Yet many agricultural and extension education practitioners lack the necessary evaluation capacities—the attitudes, knowledge, and skills—required to do good program evaluation (Harder, Ganpat, Moore, Strong, & Lindner, 2013). What’s more, leading scholars from both international development and program evaluation have argued that we do not need more technical “how-to” kits on evaluation, but rather more “evaluation thinking” toolkits (e.g., Schwandt, 2008). Simple, technical, evaluation toolkits will not suffice because international agricultural and extension education—like all international development—is fundamentally complex and dynamic; it requires more adaptive approaches to programming and evaluation that encourage and manage the ongoing emergence of co-created solutions through shorter learning and response cycles (e.g., Ramalingam, 2013). This is why the United States Agency for International Development (USAID), through their “learning lab” initiative, has recently begun calling for more “complexity-aware monitoring” (USAID, 2013). “Evaluative thinking” (ET) is an emergent notion which, in brief, can be defined as critical thinking applied to contexts of organizational learning, monitoring, and evaluation. Intentional efforts to promote ET can
increase the evaluation capacity of agricultural and extension education practitioners, with potentially significant positive ramifications.

**Purpose and Objectives**

The purpose of this paper is to present ET as a promising way to improve evaluation capacity—and ultimately evaluation quality—among front-line educators and administrators involved in agricultural and extension education globally. The specific objectives are to: (1) define and explicate ET as an emergent construct within the field of evaluation; (2) demonstrate the saliency of ET vis-à-vis the current climate of international development evaluation; (3) present guiding principles and specific practices for promoting ET among agricultural and extension educators; and (4) discuss the findings and implications of a mixed methods exploratory study on a capacity building approach designed to promote ET among agricultural and extension educators in Ethiopia and Zambia.

**Methods**

This paper engages in methods in two distinct ways: First, it reviews of the pedagogical underpinnings and practical capacity building methods that guide this approach to promoting ET—drawing from domains such as reflective practice (Argyris & Schön, 1978), critical thinking (Brookfield, 1987, 2012; Facione, 1990, 2000), and cognitive research (Kuhn, 2005); Second, it presents the methodological approach to mixed methods that was used to collect early stage data on ET-promoting workshops with fifty agricultural and extension education practitioners in Ethiopia and Zambia. A concurrent mixed methods design (Creswell, 2009) guided primarily by the pragmatist paradigm of mixed methods (Datta, 1997) was used. Quantitative data collection consisted of a Likert-style response option survey with sub-scales from a validated measure of evaluation capacity (Taylor-Ritzler, Suarez-Balcazar, Garcia-Iriarte, Henry, & Balcazar, 2013) plus a set of theory-based items focused on indicators associated with ET. Qualitative data collection consisted of participants’ reflective journaling (about their intention to use ET in their work, etc.), participant observation, and purposively sampled interviews. Mixing of data occurred at the level of analysis, at which point the multiple data sources help illuminate a more multi-faceted view on the phenomenon (the processes and outcomes of the ET workshops).

**Results**

Although further analysis is still ongoing, initial results suggest that: (1) participants perceive value in the ET workshop, (2) participants make substantive positive changes in their level of knowledge about ET during the workshop, (3) participants demonstrate increasingly complex ET skills and behaviors, and (4) participants articulate intention to instill ET into their daily practice as educators. Additionally, potential limitations and barriers to this approach are also noted, which can be used to improve future efforts to promote ET.

**Implications**

Intentional promotion of ET can help agricultural and extension educators move away from being technical content providers and towards being “knowledge workers” situated in their communities, ready to think critically and evaluatively about programs, organizations and community needs in more complexity-aware ways.
References


Examining Knowledge Change and Behavioral Intention of Rural Farmers in Ghana following an Agricultural Education Workshop

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Keywords: Ghana, Agriculture, Education, International, Knowledge

Introduction
Over half of the developing world’s population live in rural areas, with about 2.5 billion people making their living in agriculture (Fan, Brzeska, Keyzer, & Halsema, 2013; UN FAO, 2012). The majority of the farming population live in poverty and constitute half the world’s undernourished population (Fan et al., 2013; International Food Policy Research Institute, 2005). Specifically, in Ghana, “over 60% of the population depends on Agriculture for their livelihood [and]…more than 30%...live below the poverty line” (Quaye, 2007, p.74). Rural farmers in developing countries lack knowledge, access to educational resources, and capacity to stay informed of and implement farming practices (Buadi, Anaman, & Kwarteng, 2013; Lambrecht, Vanlauwe, Merckx, & Maertens, 2014; Unilever, 2014). Hunger and poverty can be suppressed in developing countries through educational investments in both people and agricultural productivity as well as promoting economic growth by encouraging the utilization of innovations strongly embedded in agriculture (UN FAO, 2012).

Purpose and Objectives
The purpose of this study was to determine the effect of an educational program on knowledge and utilization of farming practices among rural farmers in Ghana. Ultimately, the study aimed to determine the change in knowledge among participating farmers, as well as their current and planned farming practices. Specific research objectives were: 1) assess rural farmers’ knowledge of farming practices before and after an agricultural education workshop and 2) determine farmers’ current behavior and intent to implement selected farming practices.
Methods

This quantitative case study used a census of workshop participants. The same workshop was delivered in two locations, Gomoa Enyene (workshop one) and Agona Nyakrom (workshop two). Pre- and post-tests, were developed by the researchers, and content validity of each instrument was established by a panel with expertise in instrument development, agricultural extension education, agricultural practices in rural Ghana, as well as the cultural context of rural Ghana. The instruments contained 55 true knowledge questions regarding practices utilizing native plant species. The instruments utilized five point, Likert-type scales (1 = Never, 5 = Always) to determine participants’ current and planned behaviors in regards to 10 selected farming practices.

Results and Conclusions

Objective one assessed farmers’ knowledge before and after an agricultural education workshop. Respondents from workshop two correctly answered a greater number of questions \( (M = 17.39, SD = 5.62) \) than workshop one respondents \( (M = 12.31, SD = 7.42) \). Analysis revealed that the difference in pre-workshop knowledge levels between the two locations was statistically significant \( (t(173.16) = -5.28, p < .05, r = .37) \). Thus, workshop two participants possessed greater beginning knowledge of the farming practices to be taught. Post-workshop knowledge levels were not significantly different between workshop one \( (M = 26.66, SD = 13.30) \) and workshop two \( (M = 29.15, SD = 11.66) \), indicating that the workshops participants possessed similar knowledge at the completion of the workshops.

For each workshop, a significant difference was found between total number of correct answers before and after the workshops. Workshop one saw an increase of 26.1% in total number of correct answers, \( (t(84.44) = -7.69, p < .05, r = 0.64) \). Workshop two saw an increase of 21.5% in total number of correct answers, \( (t(37.46) = -5.57, p < .05, r = 0.67) \). This indicates that workshop participants’ knowledge of selected farming practices increased.

Objective two sought to describe participants’ current and planned behavior. Participants from workshop one reported never or rarely using the 10 selected farming practices. Respondents indicated they planned to apply all 10 practices sometimes or often. Workshop two participants reported never using eight of the selected practices and rarely using two. Respondents indicated they planned to apply all 10 practices sometimes or often in their farming.

For both workshops, a significant difference was found between participants’ current and planned behavior for all 10 selected practices. Negative mean differences indicate they planned to implement the practices more often. Workshop one’s smallest mean difference was reported for incorporating wood ash, \( (M = -1.45, t(32) = -4.77, p < .05) \). The greatest mean difference was for utilizing granite dust, \( (M = -2.60, t(32) = -9.85, p < .05) \). Workshop two’s smallest mean difference was for integrating neem, \( (M = -1.60, t(31) = -5.33, p < .05) \), while the greatest mean difference was for alley cropping, \( (M = -2.75, t(23) = -6.95, p < .05) \).

Recommendations

Future research should include interviews with farmers to gain a deeper understanding of barriers they face in implementing various farming practices and to determine their current and preferred means of acquiring farming education and resources. Continued observation to determine implementation of selected practices is also recommended. Future outreach should incorporate experiential learning in implementing selected farming practices.
References


Examining the Effect of Familiarity with Water Policies on Engagement in Water Conservation Behaviors

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Keywords: Water quality, Conservation behavior, Policy, Experience, Education

Introduction

Water is the foundation of human lives, however, human reliance on water has led to global water issues, including water pollution and contamination, water scarcity, degradation of water quality, waterlogging, and increased water salinity levels (Young, Dooge, & Rodda, 1994). In order to sustain water resources, water conservation technologies and practices have been developed, such as installing weather-based irrigation controllers and only running full washing machines (United States Environmental Protection Agency, 2012). Additionally, national agencies in various countries have developed regulations for water conservation (The World Bank, 2014). Since engagement in water conservation can be affected by knowledge of water issues, experience of water issues, normative beliefs surrounding water conservation behaviors, awareness of water conservation campaigns, and participation in educational programs (Corral-Verdugo, & Frías-Armenta, 2006; Eden, 1996; Huang & Lamm, 2014; Singletery & Daniels, 2004; Syme, Nancarrow, & Seligman, 2000), effort can be made by international extension educators (IEEs) to educate the public about water policies in order to enhance engagement in water conservation behaviors.

Purpose and Objectives

The purpose of this study was to identify how experience with water issues and familiarity with water policies impacted engagement in water conservation behaviors. The objectives were to:

1. Describe respondents’ experiences with water issues, familiarity with water policies, and level of engagement in water conservation behaviors.
2. Determine if experiences with water issues and familiarity with water policies predict level of engagement in water conservation behaviors.

Methods and Data Sources

This study used an online survey to address the research objectives. Florida residents were chosen as the target population because of water issues the state faces that could be extrapolated to a global audience. The instrument was based on the 2012 RBC Canadian Water Attitudes Study (Patterson, 2012), was reviewed by an expert panel and pilot tested.

Respondents were asked to indicate their experience with five water issues, their level of familiarity with various water policies on a five-point Likert-type scale, ranging from 1 = Not At All
**Familiar to 5 = Extremely Familiar** and their likelihood of engaging in water conservation behaviors using a five-point Likert–type scale, ranging from 1 = Very Unlikely to 5 = Very Likely. Responses were averaged to generate index scores for level of familiarity with water policies, civic behaviors, landscaping behaviors, and willingness to take water conservation action, which were found to be reliable (α = .93; α = .80; α = .80; α = .83).

The survey was sent to 537 Florida residents resulting in a response rate of 96% (N = 516). Post-stratification weighting methods were used to compensate for potential exclusion, selection, and non-participation biases (Baker, et al., 2013; Kalton & Flores-Cervantes, 2003). Descriptive statistics and regression were used in data analysis.

**Results**

The majority of respondents had not experienced water issues, but 20% had experienced poor quality drinking water at home. Within the eight listed water policies, more than half of the respondents were not at all familiar or only slightly familiar with them, except the Clean Water Act (54%). Respondents were likely to engage in civic behaviors ($M = 3.54$, $SD = .77$) use alternative landscaping practices ($M = 4.16$, $SD = .63$) and are willing to conserve water ($M = 3.54$ ($SD = .73$). Regression analysis was used to determine if engagement could be predicted by experience with water issues and familiarity with water policies (Table 1). The results indicated they were both significant predictors of civic water conservation behaviors and familiarity with water policies was a significant predictor of all three.

**Table 1**

| Water Conservation Behaviors Predicted by Experience with Water Issues and Familiarity with Water Policies |
|---------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|
| Water Conservation Behaviors                                 | Civic Behavior $(R^2 = .22)$                                  | Alternative Lands Practice $(R^2 = .07)$                       | Willingness to Conserve Water $(R^2 = .05)$                   |
| $B$                                                           | $p$                                                           | $\beta$                                                       |
| Experiences water issues                                     | 0.20                                                          | 0.00                                                          | 0.10                                                          |
| Familiarity with policies                                    | 0.39                                                          | 0.00                                                          | 0.23                                                          |

**Conclusions and Recommendations**

The respondents reported limited experience with water issues and low familiarity with water policies, but were likely to engage in water conservation behaviors. In addition, experience with water issues and familiarity with water policies were predictors of engagement. Therefore, when IEEs develop programs about water conservation behaviors, they should cover material related to water policies because participants will be more inclined to engage if they are familiar with policies. Furthermore, IEEs should enhance people’s familiarity with water policies by developing marketing materials focused on water conservation issues.
References


Examining the Introduction and Use of Mobile Technology in India’s Extension Program

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Keywords: Hand-held technology, Extension, Agricultural application

Introduction

Agricultural extension efforts in India are carried out by public, private and non-governmental entities. Public sector extension is delivered through state agriculture departments, State Agricultural Universities (SAUs), and the Indian Council of Agricultural Research (ICAR) through centers known as Krishi Vigyan Kendras (KVK). KVKs are multidisciplinary extension units with financial support from ICAR, under administrative control of SAUs. ICAR has 638 KVKs in eight zones across India. Each KVK has a program coordinator with six subject matter specialists to carry out extension activities among the farm families within their respective region.

India’s small and marginal farmers need access to a diverse set of services such as information on markets, weather, processing, animal health, and entrepreneurship (Glendenning, Babu & Asenso-Okyere, 2010). This could be achieved through an extension specialist equipped with modern information and communication technology tools that facilitate knowledge dissemination and advisory services.

Under the Agricultural Innovation Partnership (AIP), an innovation utilizing mobile solutions (mAIP on Android tablets) was introduced in 2013-14 to provide farmers with information and advice related to crop cultivation, weather conditions, market information, etc. Android tablets have been distributed to 47 KVK extension agents among five SAUs to create farmer databases and provide real-time solutions to field problems (see Table 1).
Table 1  
*Distribution of mAIP Tablets Across India*  

<table>
<thead>
<tr>
<th>University</th>
<th>KVKs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assam Agricultural University (AAU)</td>
<td>20</td>
</tr>
<tr>
<td>Banaras Hindu University (BHU)</td>
<td>2</td>
</tr>
<tr>
<td>Rajendra Agricultural University (RAU)</td>
<td>12</td>
</tr>
<tr>
<td>Sardar Vallabhbhai Patel University of Agriculture and Technology (SVPUAT)</td>
<td>2</td>
</tr>
<tr>
<td>Tamil Nadu Agricultural University (TNAU)</td>
<td>11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>47</strong></td>
</tr>
</tbody>
</table>

The mAIP has five different modules capturing farmer profiles to access complete information via a single database, field plot survey using GPS to assist in information dissemination, compressed short training videos to demonstrate best agricultural practices, remote crop management to provide timely technical advisory services and data survey to document complaints over time.

**Purpose and Objectives**

The purpose of this research project is to examine the introduction of the mAIP for effectiveness in the field. Specific objectives are to:

1) Determine the extent that KVK extension specialists are creating databases by enrolling farmers in the mAIP program.
2) Quantify the number of solutions provided to farmers, the response time taken, and the specific areas being addressed.

**Methods**

Under AIP, Sathguru Management Consultants, a private sector partner has developed the first-of-its-kind mAIP to enhance the performance of extension workers. The mAIP was tested over three months in the states of Tamil Nadu, Assam and Uttar Pradesh. The locations were selected to provide geographic diversity, difference in Internet connectivity, climatic conditions and work culture.

**Results and Conclusions**

The first objective sought to determine the extent KVK extension agents enrolled farmers in the mAIP database. The farmers’ database forms the basis for the rest of the modules in the solution. Table 2 illustrates the total number of farmer profiles captured.

Table 2  
*Total Number of Farmer Profiles And Corresponding State Agricultural University*

<table>
<thead>
<tr>
<th>University</th>
<th>Profiles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assam Agricultural University (AAU)</td>
<td>22,935</td>
</tr>
<tr>
<td>Banaras Hindu University (BHU)</td>
<td>105</td>
</tr>
<tr>
<td>Rajendra Agricultural University (RAU)</td>
<td>60</td>
</tr>
<tr>
<td>Sardar Vallabhbhai Patel University of Agriculture and Technology (SVPUAT)</td>
<td>190</td>
</tr>
</tbody>
</table>
The second objective sought to identify the number of solutions provided to farmers, response time taken, and specific areas addressed. Table 3 highlights the numbers of problems registered and solutions provided in the mAIP system.

Table 3
Problems Registered With mAIP And Number of Solutions Provided.

<table>
<thead>
<tr>
<th>University</th>
<th>Registered Issues/Problems in mAIP</th>
<th>Solutions provided</th>
<th>Pending solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAU</td>
<td>1,351</td>
<td>1,056</td>
<td>295</td>
</tr>
<tr>
<td>BHU</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>RAU</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SVPUAT</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TNAU</td>
<td>103</td>
<td>51</td>
<td>52</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,454</strong></td>
<td><strong>1,107</strong></td>
<td><strong>347</strong></td>
</tr>
</tbody>
</table>

Of the farmers registered in Assam, 1,351 raised questions about crop problems with 1,056 receiving advisory services from the application (Assam Agricultural University-Jorhat, 2014). Depending on the problem, the time taken for advisory responses ranged from twenty minutes to two days. The queries were related to animal husbandry, vegetable production, floriculture, pest attacks, and animal health.

**Educational Importance, Implications, and Application**

The mAIP provides a necessary education tool to the extension specialists at the KVKs. The mAIP gradually builds the database of the farmers’ profile, their land details (GPS), farming issues and solutions. Through its remote crop management module, the linkage with the university is strengthened. This module provides real farm issues to the research faculty so they can develop solutions. The university administering KVKs acquires rich data to help in targeted policy initiatives in their region.

Sathguru Management Consultants, long-term associates of Cornell University activities in South Asia, manages the AIP project in India.

**References**


Extension Officers’ within CARICOM Self-Perceived Assessment of the Importance, Knowledge, and Application of Selected Competencies

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Keywords: Competencies, CARICOM, Extension Officers

Introduction
Extension in the Caribbean is offered primarily as a public good either through the Ministry of Agriculture or similar agency. Public extension in some countries in the region fails to adequately meet clientele needs due to lacking resources or untrained staff (Umaharan, 2008). McClelland (1973) posited workplace success is best measured by the use of a competency approach. Cooper and Graham (2001) indicated the success of the U.S. Cooperative Extension Service depends on retaining highly qualified, competent personnel, capable of addressing changes in society as they occur. Extension professionals must be proficient in several competencies in order to be successful in the performance of job duties (Gibson & Brown, 2003). Thus, the adoption of competencies in the Caribbean Community (CARICOM) could lead to individual and organizational success.

Purpose and Objective
The purpose of the study was to examine the competencies and professional development needs of extension officers in CARICOM. The objective reported here was to describe extension officers’ perceived level of importance, knowledge, and application for identified competency areas.

Methods
This was an ex post facto quantitative study that used descriptive statistics. The questionnaire was modeled mainly after the instrument used by Awang (1992). The instrument contained two sections: (a) eight competency areas and (b) demographic characteristics. The reliability coefficient for the internal constructs ranged from .89 to .96. The Borich (1980) model of needs assessment was used to measure participants’ perception of the eight competency areas identified. Data were collected in late 2013 using a self-administered questionnaire following the Dillman, Smyth, and Christian (2009) Tailored Design Method. A census was attempted of all
officers in the population (N = 400); thus, sampling procedures were not utilized (Cantwell, 2008). Anguilla, Antigua and Barbuda, Barbados, Belize, Cayman Islands, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent, Trinidad, and Tobago participated in the study. SPSS was used for data analysis. Data were weighted by relative non-response rate to correct for survey nonresponse to improve the accuracy of estimating the characteristics of the population (Bethlehem, 2008). The mean and standard deviation were calculated for each competency area by importance, knowledge, and application.

**Results and Conclusions**

A response rate of 55% was achieved. Respondents perceived Extension Organization and Administration to be of extremely high importance (M = 4.53, SD = .49). The remaining competencies were perceived to be of above average importance. Respondents perceived their knowledge to be above average in all eight competency areas. Extension Organization and Administration (M = 4.29, SD = .57) received the highest rating while External Linkages (M = 3.68, SD = .70) received the lowest rating. Respondents perceived their competence in the application of seven competency areas to be above average with Extension Organization and Administration (M = 4.20, SD = .56) being the area of highest competence. External Linkages (M = 3.46, SD = .75) was perceived to be the competency area where the level of application was average.

The means of each competency area indicated extension officers have a good understanding of the organizational structure, mission, and policies of the department; the duties of his/her position; and required reporting associated with the job. A significant portion of their performance evaluation hinges on several of the competency items within this competency area. Thus, officers probably invest a significant amount of time ensuring they become versed in this area in order to receive favorable performance ratings.

The External Linkages competency area received the lowest mean scores for importance, knowledge, and application. It is crucial for extension officers to learn how to network with other stakeholders to source untapped expertise to boost the quality and relevancy of programs delivered. Campbell (1999) stressed the importance of collaboration as “[e]xtension organizations cannot exist by themselves, but in association with others” (p. 59).

**Recommendations**

Extension systems within CARICOM and local public service commissions should adopt the eight competency areas. The competencies and associated descriptors must be clearly communicated to all employees. The competency areas and associated competency items can be used as a guide to determine training for potential extension officers at tertiary institutions within CARICOM, recruitment of new hires, and standards to be attained by extension officers upon which performance appraisals can be based.

**References**


Factors Affecting Effective Use of ICT in Information Dissemination by Extension Agents in Benue State, Nigeria

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Keywords: Factors, Effective, Use, ICT, Dissemination, Extension agents, Abstract.

Introduction
Nigeria before the advent of oil was solely an agrarian nation. The discovery of oil however, shifted the focus from agriculture result in perennial food crises. In order to address the problem of food insecurity, several agricultural development programmes (ADPs) were developed Jibowo (2005). The ADPs among other responsibilities are responsible for agricultural innovative information dissemination (BNARDA, 1999). One of the chief approaches to achieving this objective was the training and visit (T&V) system (Ejembi, Omorogbee and Ejembi, 2006). Nevertheless, with the increase in population of Nigerian farmers, it seemingly became impossible to reach farmers with innovation effectively due to poor infrastructure and other logistics hence the need for ICT (Munyna, 2000). In order to effectively use ICT, a level of competence and or proficiency on the part of both the extension agent and clientele is required (Technical Centers of Agricultural Cooperation; CTA, 2000).

Purpose and objective of the study
Nigeria has steadily increased in population, thereby increasing the ratio of extension agent to farm families (Benue Agricultural and Rural Development Authority BNARDA, 1999). In order to bridge this gap, ICT become the pertinent option. The Federal Ministry of Agriculture recently introduced cell phone technology through which information can be given to farmers directly for effective adoption. This is yet to yield the desired results consequently; this study was designed to assess the factors responsible for the effective use of information and communication technologies. To achieve this, the following specific objectives were necessary:
(i) examined the profiles of extension agents’ contact farmers, identified the predominant ICT used in the area and (iii) determined the factors affecting effective use of this ICT.

**Methodology**

The study was carried out in Benue State, Nigeria using contact farmers of the Benue State Agricultural and Rural Development Authority (BNARDA), the agency charged with agricultural extension responsibility as respondents. A total 100 respondents were randomly selected for the study. Data for the study were analysed using percentages and logit regression model to determine the effects of selected socio-economic factors on ICT competency in information dissemination.

**Results and Conclusion**

Results of the study show that 56% of the respondents were males and many (41%) were aged 21-30 years. About 40% had primary and secondary education with about 40% having estimated annual income of between N25,000-N50,000 (about 120-350 USD) indicating high poverty level. The results further reveal that majority (76%) of the respondents make use of mainly cell phones. This may be because of the respondents’ low income status which may not afford them the luxury of acquiring bigger ICT equipment (Ejembi, Abah and Attah, 2014). These results indicate that male gender predominate the agricultural sectors with its attendant implication on extension training programmes for effective ICT usage due to cultural barriers which may preclude women from the benefits of extension services (Ejembi, Omoregbee and Ejembi, 2006). The results also show that the educational level is low. This may hamper the dexterity with which ICT complexities could be handled thereby making training in ICT an uphill task (Ofuoku, Emah and Itedjere, 2000). The annual income of less than N100,000.00 (less than 800USD) per annum reveals high poverty status. This further suggests that acquisition of ICT and their maintenance would be a serious concern (CTA, 2000).

Selected socio-economic factors of the respondents were subjected to logit regression analysis and the results show that age of respondents (0.037), educational level (0.000) and income (0.61) significantly affect effective use of ICT at 10% level of probability. This implies that to achieve good results in ICT usage, attention must be given to stage of development of an individual, educational level and income generating activities. This will greatly enhance individual performance as they will be highly motivated (Igbago, 2008).

**Recommendation**

Based on the findings of this study, it is recommended that since income level is too low to support formal educational attainment, extra mural and or adult education services should be encouraged in the study area for extension agents and farmers to improve their understanding of ICT. It is also recommended that cell phones being most used ICT facility be highly subsidized to enable the low income farmers and extension agents obtain them.

**References**


Farmer Participation in the Development and Dissemination of Tomato IPM Strategies in Uganda: Lessons Learned

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Introduction
Farmer participation in agricultural research and extension efforts and integrated pest management (IPM) are important strategies for improving agricultural development in sub-Saharan Africa. The goal of IPM is to manage destructive pest populations while simultaneously eliminating or reducing the use of chemical pesticides by integrating a variety of practices into a pest management system. Over several decades, attempts to develop and disseminate IPM throughout sub-Saharan Africa have met with limited success (World Bank, 2008; Orr, 2003; Morse & Buhler, 1997). A variety of policy, research and market related factors have constrained IPM adoption, with others suggesting that the central problem is one of transferring IPM knowledge and systems to farmers (Rajotte et al, 2005; World Bank, 2007). Increasing farmer participation in the development and implementation of IPM programs emerged as a strategy for increasing the relevance and use of IPM, particularly among smallholder farmers (Erbaugh, et al., 2001; Yudelman et al., 1998).

The IPM Collaborative Research Support Program (IPM CRSP) has been using a farmer participatory IPM (PIPM) approach with smallholder tomato growers in East Africa since 2007. In addition to being participatory, the approach emphasized multi-stakeholder collaboration among farmers, extension providers and research scientists in each step of the technology research and development process.

Purpose
The primary purpose is to summarize the contributions and lessons learned from using a participatory approach to develop IPM strategies for smallholder tomato growers in East Africa.

Philosophical theme
Active farmer participation in development activities has emerged as an important development approach. The IPM CRSP philosophy is to use a PIPM approach with small farmers to improve development and adoption of IPM strategies.
Results

Applying the PIPM process groups of farmers were engaged in problem identification and on-farm trials, that led to the development of a tomato IPM package that consisted of:

(1) pest scouting; (2) introduction of a bacterial wilt resistant variety, (3) staking, and (4) mulching. Of the 120 growers engaged in the process in Uganda, 85% used two or more of the component technologies. Over 80% used the improved variety, 83% used grass mulches, and nearly 50% scouted their fields prior to pesticide application. The package reduced pesticide applications from 12-24 per growing season to three spray applications, lowering costs of production by about 50% (about $500/hectare). It also increased quantity produced and quality. Vendors in a Kampala market now pay a price premium to these IPM growers. It is 2.5 times higher than that paid for tomatoes produced using traditional practices.

Recommendations and Educational Importance

Using the PIPM approach resulted in an effective tomato IPM package being developed and adopted by growers.

- Selecting an important cash crop, such as the tomato, whose production was associated with excessive pesticide use, was an important entry strategy for the program.
- Farmer participants were very interested in alternative pest management strategies to protect their crops while reducing pesticide use.
- Working with farmer groups and associations facilitated participation and dissemination of practices.
- Socioeconomic and biological baseline surveys helped validate farmer pest management practices and priority pests. They established that most farmers were spraying their tomatoes 12-24 times per season and were unfamiliar with alternative pest management practices, disease epidemiology, the concept of disease vectors, and less visible insect pests such as thrips.
- Farmer participation in the biological monitoring of diseases and insect pests helped introduce the IPM strategy field scouting and improved pest recognition.
- Farmer engagement in farm trial testing of package components, resulted in their improving their farm management capacity.
- Engaging extension agents in the PIPM process was essential to the success of the program. Their knowledge of local farmers, farming systems and markets helped ensure that research priorities were carefully crafted to reflect the needs of farmers.

Several issues with this approach were (1) the high cost of implementing a participatory approach in terms of scientific personnel; and (2) the diffusion effects to other non-participating farmers were low, indicating the need to use alternative methods, such as farmer field schools, to scale-out technologies to larger number of farmers.

Another research issue was the difficulty of maintaining scientific rigor with on-farm trials. The desire by donors to achieve rapid results can impact negatively on scientific rigor and thus on obtaining replicable and publishable results.

The PIPM process was dynamic and resulted from the systematic interplay of formal and farmer knowledge systems. It led to creation of new knowledge and a synthesis of tactical and ecological IPM approaches. It also helped ensure that the process was farmer demand driven and addressed key farmer problems.

References


Farmers’ Adoption of Health and Safety Practices in Trinidad

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Introduction  
Agriculture ranks as a top hazardous industry, workers are subjected to higher risks of fatal and non-fatal injuries as well as occupational diseases (CDC 2013). There are approximately 20,000 farmers in Trinidad and most are above 50 years old (ECLAC 2013). These farmers will continue to be the backbone of the industry as younger persons are slow to enter the sector. For sustainable food production and national food security, actions must be engaged to maintain health and safety of farmers on farm. No study has been done in the farming sector to understand the status of Trinidad farmers’ health and safety adoption.

Purpose  
This study seeks to (i) determine the adoption of health and safety practices on farm and (ii) identify the factors that impact adoption.

Methodology  
One hundred farmers were surveyed in ten most populated agricultural pockets in Trinidad using a structured questionnaire. Some 14 statements were used to determine farmers’ practice adoptions towards reducing/preventing occupational accidents, injuries and diseases. The scale (14 items) had good internal consistency (α = 0.82). Descriptive and ANOVA results are presented.

Results  
Characteristics of Farmers: The majority of respondents were males (82%), older (45-70 years) had attained secondary level education (58%), were farm owners (65%), were experienced in farming (63% had >10 years). The majority of farmers (72%) did not reside on the farm premises, and worked >6 hours per day on the farm (83%). Some 67% reported that they were visited by extension officers, of which the majority (95%) reported monthly visits or less. Some 53% of the farmers stated that they were not familiar with the health and safety issues in agriculture.
Farmers’ Practice Adoptions to Reduce/Prevent Occupational Accidents, Injuries and Diseases: Mean frequencies showed that 38% of farmers always took precautions to reduce/prevent occupational health and safety hazards; 33% of farmers sometimes took precautions and 22% of farmers never took precautions. This suggested that farmers’ practice adoptions were fairly good.

Farmers best practices were in certain areas, “I immediately contact the relevant authorities if an accident/emergency occurs” (83% of farmers always took precautions) and to reduce/prevent ergonomic hazards, “I try my best to work in comfortable positions” (60% of farmers sometimes took precautions). Farmers had poor practice adoptions to reduce/prevent physical (sun) hazards, as evident by the statement, “I wear protective clothing when working in the sun” (54% of farmers never took precautions).

Relationships with Farmers’ Practice Adoption Scores

Farmers’ adoption scores were impacted by age of farmer, role on the farm and if visits were received by Extension. In summary, Tukey’s b post hoc test indicated that older farmers >31 years undertook significantly more precautions to reduce/prevent occupational accidents, injuries, and diseases than farmers between the ages of 18-30. For job role on-farm, Tukey’s b post hoc test confirmed that farm owners undertook significantly more precautions to prevent/reduce occupational accidents, injuries, and diseases than family workers and hired labourers. Also, Tukey’s b post hoc test confirmed that farmers who were visited by extension officers undertook significantly more precautions to prevent/reduce occupational accidents, injuries, and diseases than farmers who were never visited by extension officers. Mean practice adoption scores did not significantly differ with gender, frequency of visits by extension officers and farmers’ familiarity with health and safety issues in agriculture.

Conclusion

The overall level of adoption of health and safety practices on farm, although fairly good, is not acceptable given the aged farm population. Younger farmers do not engage in sufficient safety practices and hired help practised least safety practices on farm.

Recommendations

The adoption of health and safety practices on farm needs to be improved. Extension agents need to be trained to in health and safety issues to be able to educate farmers. They should visit farms more frequently and have a formal set of guidelines that lists best practices for farmers to follow. Extension should target younger farmers and persuade them to improve farm safety habits to ensure good health into the future. Farm owners need to know that they have responsibility for their hired help and ensure that they are also educated and outfitted to practise health and safety.

References


From School Garden to Home Garden: Transfer of Agricultural Knowledge and Practices through School Gardening in Primary Schools in Eastern Uganda

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Introduction

Education is the society’s main instrument for reproducing itself and can be a key ingredient for social change including poverty eradication (Birdsall, Levine & Ibrahim, 2005). Uganda’s launch of the Universal Primary Education (UPE) in 1997 towards achieving Millennium Development Goal (MDG) No. 2 could also be a springboard for disseminating agricultural knowledge and technologies to transform agriculture – an opportunity not been harnessed to-date. More than 70% of pupils who enrol in UPE drop out (Kibwika, Okiror & Kyazze, 2010; Murphy, 2003) and turn to farming for a livelihood, but current education system does not prepare them for this occupation (Okiror, Matsiko, Oonyu & Kibwika, 2010; Kibwika & Tibezinda, 1998).

School gardening is one way to better prepare the next generation of farmers. The concept of school gardening is not new (Sealy, 2001) and its potential is well known (FAO, 2004; Desmond, Grieshop & Subramaniam, 2003) but the challenge is how to do it in a manner that motivates and rewards pupils to apply the knowledge in real-life. This study used agricultural clubs to empower pupils to decide what they wanted to grow/rear and put them in full control of the outcomes of their efforts.

Purpose and Objectives

The purpose of the study is to illustrate the potential of school gardening as a laboratory for effective teaching and learning of agriculture and a knowledge and technology dissemination channel to farmers.
Methods

The study was conducted in two public primary schools in Eastern Uganda, Nalango Primary School in Kamuli district and Tubur Primary School in Soroti district through action oriented research. In each school, 100 pupils were voluntarily recruited in two enterprise based agricultural clubs making a total of 200 pupils involved. Each club of 50 members in a school comprised of pupils from Primary three to Primary six. A test-retest method was used to assess the knowledge gain among the club members. Three tests were administered to each class over a period of ten months (two growing seasons) and paired t-tests were performed to compare knowledge gain across classes.

Start-up packs (seed and fertilizers) were made available to club members to try out the same practices at their homes. These were followed up to establish the transferability of knowledge and skills. In addition, a field-day was organized at each school every season for members the neighboring community including parents to visit and learn from the school gardens. During these events, the club members took responsibility to explain the practices to their parents. They also disseminated related agricultural information through music and poetry.

Results and Conclusions

Empowerment of the pupils through agricultural clubs to make their own decisions and to own and control the outcomes of the school gardening created the motivation for voluntary participation in agricultural activities. Through their participation in the school gardening, the club members in all classes progressively gained knowledge with a range between the lowest and highest test scores of 24% for P.3, 26% for P.4, 5% for P.5 and 15% for P.6. However comparison of mean scores across classes using the paired t-test indicates significant difference only for Primary six class. This is possibly explained by their ability to read and interpret questions in English language and to relate knowledge and practice.

The field days were a platform for exposure of parents and neighboring community to new technologies especially crop varieties. Most parents came to the field day because their children informed them about new practices of farming. The community neighboring Nalango Primary School accessed new cassava varieties from the school gardens. Nearly 70% of the 55 students students who received start-up seed packs for maize and beans planted them at home following similar practices as in the school garden, 27% planted but using the traditional practices, while 3% did not plant.

Implications

Extension needs to target school gardening through agricultural clubs to create platforms for learning and innovation related to agricultural practices. Through this way, extension will be skilling the next generation of farmers for modern farming while also influencing the current farmers to improve their agricultural practices. The primary schools then become learning centers for the wider community and not only for secular education for the children. The impact of school gardening radiates faster in the community as the pupils spread the awareness and knowledge to their respective homes and also schools are usually more freely accessible by the community than other technology demonstration sites.

References


Gender Training Needs of Extension Staff in Ondo State, Nigeria

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Keywords: Gender, Capacity building, Extension personnel, Sustainability, Nigeria

Introduction
There is growing recognition of the fact that gender equality is important for economic growth and poverty reduction. In agricultural development, men, women and youth are recognized as equally important players, but women and young farmers generally face more socio-cultural and socio-economic constraints than men despite their contribution to agriculture. Women represent approximately 50 percent of the total population and account for 70 percent of the household food production in Nigeria (Afolabi, 2008; Ogunlela and Aisha, 2009). They also formed part of the labour force and are also responsible for the bulk of livestock production. Women are the principal labour force on small holder farms and perform the largest share in land preparation, weeding, transporting, processing and marketing of agricultural products. Building the capacity of extension staff in gender is necessary so as to bridge the gap existing between women and other gender groups in extension services and agricultural development in general. It will also ensure high level of professional competence in the discharge of official functions of the extension agents and improve the quality of service delivery and ensure that extension service are responsive to the needs and expressed demands of poor farmers, including women farmers.

Purpose and objective of the study
The main purpose of the study was to identify the gender training needs of extension staff in Ondo State Agricultural Development Programme, Ondo, Nigeria. The specific objectives were; to describe the personal and socio economic characteristics of extension staff in the study area, determine extension staff interest in gender issues and applicability of gender in their current work, identify areas of training needs require by extension staff in gender and find out obstacles hindering incorporation of gender in project planning, implementation and evaluation.

Methods and Data source
The study was adopted purposive sampling technique to select extension staff in the state. Data were collected from forty-two extension staff using a structured questionnaire. The data collected were analyzed using descriptive statistical tools such as frequency distribution, percentages.

Results and Conclusion
Half of the extension staff were well over 50 years of age. 12.5% were in the age range of 31-40 years while none of the extension staff were under thirty years of age. Male dominance was evident among the extension staff with female constituting only 15%. Sixty-seven percent of the staff were holders of Higher National Diploma certificate. 12.5% were holders of Bachelor of Science degree in agricultural related fields while 7.5% had Masters of Science. Five percent of the extension staff had OND. Only 2.5% had Doctorate degree. Number of years of work experience varies from 1 to more than 30 years with majority (57.5%) having between 21 and 30 years of experience. Thirty-five percent of the staff had agronomy as their area of specialization; 35% were agricultural extension and rural development experts while 7.5% were experts in agricultural economics. Other disciplines include General agriculture (7.5%); Fisheries (5%); Animal science (7.5%); and communication (2.5%).

Majority (72.5%) of the staff had their interest in gender issues but less than half (42.9%) indicated that they have incorporated gender adequately in their work. Specific activities/practices where gender have been incorporated include adding value to agriculture products especially cassava, utilization of agricultural produce, composition of executives in a group. Gender issues were operationalized in the various works of 45.2% of the staff. Gender mainstreaming and analysis were not so much operationalize in the staff work. The reason was due to lack of training on the process of actualizing/ operationalizing such activities. Most impending obstacles that hinders the incorporation of gender analysis in projects as highlighted by staff include lack of financial resources for gender programming, lack of gender analysis tools, lack of staff training on gender, and lack of organizational priority for gender issues. Areas of training need required include gender issues in projects and programme (77.5%), gender analysis (75%), gender and value chain (72.5%) gender awareness and sensitization (70%) and gender mainstreaming (55%). The study concluded on the need for government and development agencies to give adequate consideration to gender training needs of extension staff in the study area.

**Recommendations and Implication**

There is need to incorporate all aspects of gender in the programmes of the Agricultural Development Programme. There is also the need to build the capacity of staff in gender mainstreaming, analysis and gender and value chain, with respect to crop, livestock and fisheries.

**References**


Genetically Modified Organisms in Belgium: A Case Study of Consumer Perceptions and Awareness Based on the Potato Crisis Event

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Keywords and Phrases: genetically modified organism, perceptions, awareness, knowledge, Belgium

Introduction

Despite worldwide biotechnology advancements, European Union (EU) policymakers continue to argue over regulation of genetically modified organisms (GMOs) into the market. This uncertainty among policymakers is directly reflected in uncertainty among the European public (Drott, Jochum, Lange, Sklerka, Vach, & van Asselt, 2013; Jacob & Schiffino, 2011). Public perception of trustworthiness of national governments and large-scaled EU government—rather than fear of health and environmental risks—could be the main factor of resistance to GMOs. Belgium has been particularly sensitive to GMOs, and consumers’ internal uneasiness portrays a negative attitude toward possible regulations (Jacob & Schiffino, 2011). Durant and Legge (2010) posited that individuals rely upon emotion rather than fact when faced with decisions about GMOs, and these emotions may be guiding Belgian citizens’ GMO decision making. Mass media gives information to the public regarding events in society (McQuail, 2005), and journalists have been found to have a low level of GMO knowledge (Vestal & Briers, 2000).

In 2011, Belgian scientists, at a large research institution, planted a field trial of GM potatoes engineered for increased resistance to late blight potato disease. In May 2011, an activist group destroyed the potatoes. The event resulted in scientific damage and a court trial for defacing government property, and it did not go unnoticed by the media. A public debate began concerning “the risks and benefits of the GM crop field trial, and on the rights and responsibilities of scientists, politicians, and the broader public in assessing and managing these” (de Krom, Dessein & Erbout, 2013, p. 2).

Purpose and Objectives

The purpose of this study was to examine the potato crisis event in Belgium and determine perceptions, knowledge, and awareness of GMOs among a small sample of the Belgian public. Two objectives guided the study: (1) assess participants’ perceptions and knowledge of GMOs and associated risks and (2) determine participants’ perceptions of the potato event.
Methods

A qualitative study measured perceptions and awareness of GMOs based on the potato event. Belgian scientists (n = 5), farmers (n = 4), general consumers (n = 10) and an activist (n = 1) participated in individual interviews (N = 20) to gather qualitative data. Interviews were conducted in Belgium from May through July of 2012. A structured interview guide was developed with 20 questions and reviewed for face and content validity by a panel of experts (N = 4) with experience in agricultural communications (n = 3) or who served on the honors program committee (n = 1). Interviews were recorded and transcribed and coding the content in its original context lead to identification of emergent themes (Creswell, 1998; Strauss & Corbin, 1998). Purposive sampling, interview notes, transcription coding, use of thick description, and the NVIVO 9 audit trail provided study trustworthiness, dependability, and confirmability. The use of participants’ reflections of the potato event and GMOs in Belgium supported credibility of the findings in this study.

Results and Conclusions

Emergent themes were derived from key words, phrases, and opinions stated by respondents in the interviews. Nine emergent themes occurred: 1) variation in GMO definitions; 2) economic concerns; 3) environmental and health concerns; 4) media influence; 5) government involvement; 6) opinion of public perceptions; 7) potato crisis event impact; 8) medical biotechnology perceptions; and 9) awareness of GM food. All respondents recognized a GMO was genetically engineered for a specific purpose such as higher yield, lower costs, and less negative environmental impact. Many respondents expressed fear and uncertainty about monopolistic corporations, instead of the farmers, receiving all GMO profits. Respondents were more concerned with economic effects of GMOs than environmental or health risks. Respondents called the media biased, and expressed the need for more scientific communication, rather than relying fully on media to communicate GMO issues effectively. The idea that uncertainty among the public is a reflection of uncertainty among the different levels of EU government (Drott et al., 2013; Jacob & Schiffino, 2011) was supported by this study’s findings.

Recommendations

Although all respondents had an accurate definition of a GMO, there was confusion about GMO effects. These findings present recommendations directly from respondents about making information easier to access and understand, while maintaining scientific objectivity. Respondents found media biased and able to influence the public’s GMO perceptions, supporting the need for educating journalists on GM technology (Vestal & Briers, 2000). These findings support the idea that the indecisive viewpoint of GM regulation on different governmental levels is hindering Belgian, and perhaps European, agricultural advancements (de Krom et al., 2013; Jacob & Schiffino, 2011). Accurate GMO information through educational campaigns to Belgium consumers is critical.

References


Global Agricultural Education: Lessons Learned in Preparing for and Conducting an Intensive International Experience

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Introduction

School-based agricultural education can play a key role in “globalizing” the next generation of agriculture professionals. For decades the agricultural education profession has conducted research on globalizing the secondary school agricultural education programs (Ibezim & McCracken, 1994; Harbstreit & Welton, 1992; Davis, 1989; Peuse & Swanson, 1981). The National Research Agenda (Doerfert, 2011) for agricultural education emphasizes the need for a scientific and professional workforce in agriculture that can respond to global food, fiber and energy needs.

For current and pre-service teachers, experiences within an international setting provide opportunities to develop and enhance skills address global challenges in school-based agricultural education. If agricultural education desires to globalize the curricula and prepare students for a global workplace, teachers and pre-service students need support and assistance in planning and teaching global agriculture competencies. Lessons learned during intensive international study programs can lead to more globally cognizant local agriculture education programs.

Purpose

The purpose of the intensive global agricultural education program was to prepare globally minded agricultural education teachers through a study experience in a nation that has school-based agricultural education and university agricultural teacher preparation programs. A ten-week course was followed by a four-week in-country experience. The program was intended to assist participants in acquiring the characteristics of a global-minded agricultural education teacher (The National Council for Agricultural Education, 2011).
Methodology

The program was funded in part by a grant from the Fulbright-Hays Group Projects Abroad program. Among other requirements, the program had to be four weeks in length, include an intensive language course, and involve current and future agricultural education teachers. Eight teachers and eight pre-service students from three states participated in the program led by four faculty from two universities. The instructors recorded and discussed important lessons learned as guidance for future intensive global agricultural education programs.

Findings, Conclusions, Recommendations, Implications

The following findings and conclusions are “lessons learned” from the program, with implications and recommendations for conducting similar intensive global education programs.

1. Preparation before travel is essential. A 20-hour course included topics such as [country] culture, agriculture, and agricultural education. Allow for participants to explore their own interests.

2. Daily itinerary and expectations allow for unplanned change. A well-planned itinerary prior to departure is a must, but flexibility is essential. Determine the overall objectives and essential questions to guide the learning process.

3. Language instruction is critical. Basic [country] language instruction helps participants feel more comfortable, increases connections with [country] counterparts, and creates empathy and cultural understanding.

4. Provide platforms for documentation of individual growth and discovery. Blog, Flickr, Twitter, YouTube, and Community of Practice are easy to use and share with others. Provide instruction/training, and dedicate one person to capture each experience.

5. A minimum of two weeks for travel is essential. Experiencing the culture takes time. A short “visit” provides little time to immerse in the local atmosphere and “make sense” of what is being observed.

6. Context is essential. Base the experience in one discipline, such as school-based agricultural education. Recruit participants with a vested interest in the context, and encourage First Time in College, males, and younger students to participate.

7. Create opportunities for engagement with in-country partners. Planning and conducting microteaching lessons provides opportunities for engagement. Assign a US teacher (a good role model), US student, and in-country student to form a triad that accomplishes the teaching objective and encourages interaction.

8. Allow the group to establish group norms. The Four P’s approach (positive, prepared, pensive, pliable) keeps the group focused through stressful experiences.

9. Conduct daily reflection time led by participants and keep journals. Allocate time for reflection daily journaling. Instruction on effective practices needs to be provided for participants to lead reflection and for journaling.

10. Think nationally while thinking globally. Participants can connect with US history, geo-political issues in the region, and educational policy as a part of learning about [the country].

11. Strategically placed unstructured time is a must. Participants develop independent travel skills, identify research options, confront language barriers, explore the culture, and develop friendships during “down time.”
12. Engage stakeholders in multiple ways. Extensive and intensive global education programs require support from a variety of interested parties. Keep them informed via digital media and postcards.

13. Begin planning for the future. Offer a similar program every two years to avoid exhausting the supply of students and the hosts. Take good notes about ideas to revise future experiences. Plan for an exchange of teachers, students and faculty during the “off” year to help sustain the relationships.

References
Haitian Educators’ Channels of Communication and Key Players

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Keywords: Channels of communication; Haiti; Educators, Diffusion of innovations

Introduction
Communication channels are instrumental in extension and agricultural education efforts. Rogers (2003) theorized communication channels are important at different stages of the communication process; mass media channels are more important for increasing knowledge about an innovation while interpersonal channels carry more persuasive weight. Examining communication channels can provide change agents with valuable information for promoting an innovation.

In 2012, Projects for Haiti (P4H) introduced a new innovation, the Educator Professional Development conference. This was promoted on a limited basis and 65 educators attended that year; 130 attended in 2013; and 400 attended in 2014. Participation in professional development was unusual because 75% of educators are unqualified and 25% never attended secondary school (World Bank, 2007). Given the limited marketing strategies and resources of P4H, how were educators being persuaded to adopt this innovation?

Purpose and Objectives
The purpose of this study was to understand information flow among Haitian educators. Specifically, the objective was to examine the channels of communications that accelerated the growth of the P4H conference.

Methods
A mixed methods approach was used to guide the research and all data were collected face-to-face in Haitian Creole. A written survey was given on the last day of the conference. This study focused on where participants learned of the conference. A total of 280 participants completed the survey.

The researchers then conducted semi-structured interviews (Bernard, 2006) to understand why and how key educators were able to recruit individuals to attend. Two researchers conducted the interviews with responses recorded in field notes. Key educators were asked about their recruitment efforts and their motivation to recruit. Snowball sampling (Biernacki & Waldorf, 1981) was used to identify 11 educators.
Researchers used frequencies to describe the survey data (Powell, 1996), which helped triangulate the themes found from conducting a constant-comparative analysis of the qualitative data (Fram, 2013). The credibility, transferability, dependability, and confirmability of this methodology enabled the yielded results to be robust and trustworthy (Lincoln & Guba, 1985).

Results and Conclusions

Participants reported they learned about the conference from friends (n=280, 32.86%), school directors (n=280, 30.36%), one specific educator (n=280, 24.64%), past attendance (n=280, 13.21%), and other contacts such as siblings and pastors (n=280, 4.78%). These results suggested the existence of a critical opinion leader in the recruitment phase. Granovetter (1973) argued there is value in the superficial or weak relationships an individual may have because they often lead to opportunities that a strong tie does not provide. Furthermore, these results supported Rogers’ (2003) claim that interpersonal connections play a critical role in the persuasion of an individual to adopt an innovation, and not mass media. Because of the limited resources, interpersonal connections played a critical role in the knowledge and persuasion of attendance at this conference.

The qualitative analysis yielded several themes. Word-of-mouth was the strongest medium for disseminating information, noted by all of the key players. Key players also used their high levels of nationalism to fuel their active recruitment of participants. One informant stated, “I invited many people I know because it is good for our country. We must create a minimum of knowledge among the educators in the country.” Another informant stated, “it is your duty to share.” The participants’ motivation to rebuild their country led them to recruit educators from around the country. Amidst the absence of mass media, interpersonal communication channels were effective because of the strong sense of shared cultural obligation.

Another theme was that of distrust towards nonprofit organizations. Haiti is often called the “Republic of NGO’s” (Peace Brief, 2010), because there are a plethora of nonprofit organizations stationed in the country. Participants’ experiences with other NGOs influenced their thoughts about P4H. One informant stated, “Others did not trust P4H. Some organizations come and promise trainings but don’t follow through.”

Recommendations & Implications

Although this research focuses on a specific country, the implications may exceed Haiti. Many innovations fail because of poorly run communication campaigns (Harvard Business Review, 2011) yet financial resources are a common limiting factor in international development. This case study provides evidence that interpersonal networks can be used effectively for increasing knowledge and providing persuasion in some cultural contexts. Further, this study affirms the importance of identifying community opinion leaders to accelerate diffusion (Valente & Davis, 1999). Conducting an in-depth social network analysis is recommended as future research to identify actual linkages between individuals and groups, which can then be used strategically to further enhance word-of-mouth communications.

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How Can Extension Catch Your Attention? Evaluating International Traveler’s Perceptions of an Educational Website

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Keywords: Website, Extension, Heat map, International Travelers, Perceptions

Introduction

The usage of mobile devices and tablets has dramatically increased for accessing educational resources globally (Carter & Hightower, 2009; International Telecommunication Union, 2010). However, international extension educators (IEEs) have not readily adopted new technologies to reach broad audiences (Ovwigho, Ifie, Ajobo, & Akor, 2009).

A website designed to educate international travelers regarding the risks of carrying undeclared agricultural items (www.dontpackapest.com) was recently enhanced to adapt to the needs of today’s international travelers. Uses and gratifications theory provided an understanding of why people seek out media to satisfy their needs (Katz, Gurevitch, & Haas, 1973). Through understanding travelers’ uses and perceptions of the website, IEEs can provide better services to their audiences by improving their online educational experiences.

Purpose and Objectives

This study aimed to determine international travelers’ perception of an educational website designed to protect the agricultural industry from invasive species entering the country. The research was guided by the following objectives:

1. Determine where respondents click to identify points of interest.
2. Discover how long respondents take to determine where they find more information.
3. Determine how respondents perceive an international website focused on protecting agriculture.
Methods

An online survey was conducted with Florida residents, age 18 or older, who planned to travel to the Caribbean in the next three years, or had traveled to the Caribbean in the past three years. The survey was developed, reviewed by an expert panel, and pilot tested. A non-probability sample was used; therefore, quota sampling set a priori were used to compensate for potential selection, exclusion and non-participation biases (Baker et al., 2013). The sample size was 509. Respondents were asked to click the area where their eye first went when looking at the homepage on either a mobile, tablet or desktop version of the website. The length of time it took a respondent to make their first click, second click, and to submit the page was recorded. Lastly, respondents indicated their level of agreement on a scale from 1 = Strongly Disagree to 5 = Strongly Agree with statements about their general perceptions of the website, perceived navigation experience, and perceived quality and quantity of information. Data were analyzed using descriptive statistics.

Results

Seventy-seven percent of respondents used a desktop, 12.2% used a tablet, and 10.8% used a mobile device. Table 1 revealed the locations where respondents first clicked. Heat map images where respondents clicked when using a desktop, tablet, and mobile device are shown in Figures 1, 2, and 3. Overall, respondents clicked on the Don’t Pack a Pest logo and the Can I Bring It logo on each of the platforms; however, the Don’t Pack a Pest logo was clicked more often by mobile users.

Table 1  
Homepage Screen Shots: Clicks per Location

<table>
<thead>
<tr>
<th>Region</th>
<th>Desktop</th>
<th>Mobile</th>
<th>Tablet</th>
</tr>
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<tbody>
<tr>
<td>Don’t Pack a Pest Logo (Header)</td>
<td>42</td>
<td>26</td>
<td>20</td>
</tr>
<tr>
<td>Can I Bring It</td>
<td>45</td>
<td>65</td>
<td>59</td>
</tr>
<tr>
<td>Why You Should Be Concerned</td>
<td>n/a</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Other</td>
<td>13</td>
<td>n/a</td>
<td>8</td>
</tr>
</tbody>
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Figure 1. Mobile Homepage Screenshot Heat Map  
Figure 2. Tablet Homepage Screenshot Heat Map  
Figure 3. Desktop Homepage Screenshot Heat Map

Respondents using mobile phones spent the shortest time clicking on a page, while those using a desktop took the most (Table 2). Eighty percent liked the colors, 81.6% liked the format, 79.8% liked the images and graphics and 46% did not believe there were distracting elements on the website. The majority felt the website was useful when traveling (89.8%), easy to understand (83.7%), interesting (76.4%), and of high quality (74.4%).

Table 2  
Timing of Clicks in Seconds

<table>
<thead>
<tr>
<th></th>
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<tr>
<td>Mobile</td>
<td></td>
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</tr>
<tr>
<td>First Click</td>
<td>13.49</td>
<td>19.20</td>
</tr>
<tr>
<td>Second Click</td>
<td>18.69</td>
<td>20.63</td>
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## Implication and Recommendation

Respondents focused on effects such as buttons, bigger fonts, and highlighted objects. Since the *Can I Bring It* area is where IEEs want users to click to get more information, this area should be highlighted. Results showed timing of clicks varied between mobile phone, tablet, and desktop users. Desktop respondents spent a wider range of time than others. IEEs should incorporate more elements on educational websites for desktop screens, while using less but more highlighted elements to communicate with mobile and tablet users. Respondents were generally attracted to the website and found it userable. IEEs should use online tools to engage their audiences by providing information that is user-friendly on desktop screens, tablets and mobile phones.

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<tr>
<td>First</td>
<td>14.59</td>
<td>17.62</td>
<td>17.84</td>
<td>87.68</td>
</tr>
<tr>
<td>Second</td>
<td>20.41</td>
<td>20.63</td>
<td>21.44</td>
<td>87.95</td>
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**Table**

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I don’t know what my husband is going to say about that – What Extension can do for Women Farmers in Turkey

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Keywords: Women farmers, Extension education, Turkey, International agriculture, Developing countries

Introduction

Women farmers fulfill many roles, and have responsibilities and knowledge that differ from those acquired by men. As farmers, they plant, weed, harvest crops, and tend to livestock. As care givers, they look after children and relatives, process and prepare food and manage the home (FAO, 2011). Unfortunately, extension services do not regularly provide agricultural education related to women’s work in the farms. Sachs (1983) attributed this to the fact that women are not considered as a farmer in many developing countries, and their work in farming is rather invisible. Because of this, one may question if these women are getting enough consideration from extension services.

All over the world, women farmers are overlooked by extension services; roughly only 5% of the extension education is directed to women farmers (FAO, 2003). In Turkey, Budak, Darcan, and Kantar, (2005) indicated few extension programs were presented to women and only 3% of women participated in their study. Boyaci, (2010) stated that 7.6% of women farmers are targeted by extension services. Furthermore, even when extension services are directed to teach women farmers, either these programs are not useful for women’s works or women cannot attend because of their workloads committing them to the household and farm (Kizilaslan, 2007; Rad, Ates, Deliöğlan, Polatöz, & Özçömlekçi, 2012). Yet, extension services may introduce technology and techniques to reduce women’s workload both in the farm and household.

Feminist standpoint theory provides a framework for this study, which proposes that an individual’s own perspectives are shaped by her or his experiences in social locations and social groups (Aptheker, 1989; Harding, 1993; Hartsock, 1983; Hill Collins, 1986; Smith, 1987). Harding (1993, p. x) called upon researchers to ‘study up,’ starting from the everyday lives of
people in marginalized groups. The experiences and activities of those at the bottom of social hierarchies provide meaningful starting points for identifying noteworthy questions and problems to be explained, as well as offering a standpoint for viewing the reality of humans’ relations with each other and the natural world (p. 240). Thus, feminist standpoint theory allowed for this study to explore aspects regarding women gender inequalities in acquiring knowledge for improving farming practices from women farmers’ viewpoint.

**Purpose**

The overarching guiding question for this phenomenological study was “What gender inequalities may exist in acquiring knowledge for improving farming practices on a small Turkish farm? In order to explore this question, the study was aimed to answer the two following research questions:

1. How do women on small family farms acquire information to improve their farming practices?
2. What are women farmer’s experiences with extension services?

**Methods**

Using phenomenological inquiry (cite), we selected Beysehir district of Konya province in Turkey, because the district of Beysehir typifies small family farming in Turkey and district economy depends mainly on agriculture production mainly. In-depth, semi-structured interviews were conducted with 23 women farmers regarding their small-sized farming procedures. Interviews were conducted face-to-face, audio recorded and transcribed in Turkish, analyzed for coding, then coding was translated to English. Data were analyzed through the lens of feminist standpoint theory (Aptheker, 1989; Harding, 1993; Smith, 1987) using open codes through an iterative process to identify major themes in the data.

**Results and Conclusions**

Six themes emerged from this study. These include: women are major laborers; no experiences with extension; low formal educational level; too busy to attend extension education; husbands’ permission needed for attending; and extension education is not a priority. By studying their everyday lives (Aptheker, 1989; Harding, 1993), we learned that these rural peasant women farmers in Turkey provide labor on farm and take care of their household and extended families. More importantly, we learned these women live in a certain family order; husbands are major decision makers; and women are not to be isolated from their culture, husband, and family. Several patriarchy relationships in the village social structure existed (Kandiyoti, 1987), in which women are born into and only view life through this structure.

**Recommendations**

For agricultural education to produce meaningful changes, the viewpoints and positions of women—including their differential needs, preferences, and constraints—must be integrated into agricultural extension education agendas in countries like Turkey. Extension workers, thus, should organize extension activities in such a way that women can attend these activities regularly and activities related to their work in farm. Said differentlyIn other words, extension workers should possess “cultural competency” to better serve them. More research is needed to explore the best approaches and times to provide women farmers with extension programs and materials to better serve these women’s educational needs.
References


Identifying Competencies Needed to Apply Social Marketing to Extension Programming: 
Implications for Local, Regional, and Global Professional Development

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Keywords: Professional Competencies, Social Marketing, Behavior Change, International Extension, Extension Strategies

Introduction

Extension organizations around the world are considered primary change agencies (Rogers, 2003) and they have explored various approaches to changing behavior. Social marketing is a promising yet underutilized approach to creating behavior change (McKenzie-Mohr, 2000; Rogers, 2003). A need to increase social marketing skills and other behavior change competencies has been documented. In fact, initial professional development activities have increased extension professionals’ ability to implement behavior change programs (Reilly & Andrews, 2009).

Professional development is critical to extension professionals’ career advancement (Garrett et al., 2014). These development activities should rely on established goals that include individuals’ mastery of specific competencies, or the skills and characteristics needed to perform satisfactorily (Boyd, 2003; Schoenfeld-Tacher & Sims, 2013). Competency-based professional development promotes job satisfaction and development of core skills necessary for successful extension work (Brodeur, Higgins, Galindo-Gonzalez, Craig, & Haile, 2011).

While social marketing occupational standards have been identified in the United Kingdom (Thorpe & Truss, 2010), competencies for applying social marketing to extension programming have not previously been explored.

Purpose and Objectives

The purpose of this Delphi study was to establish a baseline for professional development activities that enhance programming capabilities for extension professionals working as change agents around the globe. The specific objective was to identify the competencies needed by extension professionals to apply social marketing to extension programming.

Methods

Selection of Participants
We used a combination of expert and snowball sampling methods (Dooley, 2007) to secure a sample of 22 experts based on the following criteria: extension professionals or applied researchers; knowledgeable about social marketing; and familiar with extension programming. Reliability within a 0.90 coefficient is ensured with at least 13 expert panelists (Dalkey, 2002). We sought to represent various viewpoints and therefore included extension educators, university faculty, independent consultants, and governmental/nonprofit professionals who collaborate with extension.

**Study Design and Data Analysis**

Our three-stage study was initiated through an email detailing the anticipated process. The first round consisted of one open-ended question: “Please identify the competencies you believe extension professionals need in order to apply social marketing principles to extension programming.” We analyzed round one data using the constant-comparative method (Dooley, 2007). We combined multiple responses into one competency if they had like meanings and separated divisible responses into single competencies.

In round two, group members were presented with the resulting competencies alongside a seven-point Likert scale and asked to rate agreement/disagreement from 1 (strongly disagree) to 7 (strongly agree) and to provide additional competencies they felt were missing. Items that achieved two-thirds consensus of agree or strongly agree advanced to round three and were subject to an iteration of the same process and criteria (Boyd, 2003; Conner, Roberts, & Harder, 2013; Shinn, Wingenbach, Briers, Lindner, & Baker, 2009). We employed a modified tailored design survey method and distributed replacement questionnaires to nonrespondents (Dillman, Smyth, & Christian, 2007). Data collection lasted 63 days.

**Findings and Conclusions**

At least 17 panelists responded to each round. Round one resulted in 208 initial responses, which were condensed into 57 competencies. A total of 41 items achieved two-thirds consensus and were presented to the panel along with six new competencies for round three. The final study findings included 37 competencies organized into eight categories: **Personal Attributes; Knowledge and Understanding; Research and Analysis; Leadership; Professionalism and Ethics; Communication; Program Planning, Implementation, and Evaluation; and System Thinking.**

The five highest-ranked competencies included: willing to use social marketing tools; identify problems or issues most appropriate for applying a social marketing approach; prioritize the thinking of the target audience rather than the researcher; understand the tools and techniques employed in social marketing; and communicate results of social marketing campaigns to colleagues, stakeholders, communities, and others. The complete list of 37 competencies will be shared during the final presentation.

**Recommendations and Implications**

Prior to conducting this study, competencies needed to apply social marketing to extension programming had not been explored. The competencies identified by this study will be useful in guiding personal self-assessment by individuals who plan to use this approach to behavior change. Additionally, they may be applied to professional development programming within local, regional, and international extension organizations that seek to increase their extension professionals’ social marketing and behavior change abilities. We recommend that
these competencies be used for needs assessments that guide the prioritization of professional development activities. Areas of common need among many countries or organizations may indicate potential areas of collaboration and concentration for international professional development initiatives while areas of need specific to a localized area may be a good candidate for individual organizations’ internal focus.

References


Impacts of International Professional Development on U.S. Educators

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Keywords: Experiential learning; Caribbean; Haiti; Educators; International experience

Introduction

The growing demands for cultural competency in educators has led to increased research on international experiences and their impact on educators (Alfaro & Quezada, 2010; Kambutu, & Nganga, 2008; McAllister, Whiteford, Hill, Thomas, & Fitzgerald, 2006). Learning is grounded in experience (Kolb, 1984). International experiences allow for increased educator competency (Hamza, 2010) and are tools for technical growth in educators (Willard-Holt, 2001).

The Conceptual Framework for Studying Globally Integrated Activities (Roberts, Stedman, Harder, Gouldthorpe, & Coers, 2012) allowed for the researcher to view learning through participant experience. Roberts et al. (2012) stated outcomes from globally integrated activities “can occur on two dimensions, intercultural competence and technical competence, both of which contribute to critical thinking” (p. 2) This research was conducted to explore how this experience impacted critical thinking, intercultural competence, and technical competence (Gouldthorpe, Harder, Stedman, & Roberts, 2012).

Purpose

This research explored the impacts on U.S. educators who delivered professional development workshops in an international context. This research sought to answer two specific questions:

1. How will reflection exercises impact educator experiences?
2. How will participating in an international professional development workshop impact U.S. educator beliefs and attitudes?

Methodology

A purposive sample was selected from U.S. participants in P4H’s Educator Professional Development Conference in Cap-Haitian, Haiti. Six elementary, three secondary, and three post-secondary educators (N = 12) formed the sample. U.S. educators participating in Projects for Haiti, Inc.’s (P4H) weeklong Educator Professional Development Conference in Cap-Haitian, Haiti participated in this study. Haiti offers a unique experience with drastic differences in climate, culture, and poverty that create an active environment for increasing cultural knowledge.
Using procedures adapted from Jones and Bjelland (2004), educators reflected on their experience using three sets of structured questionnaires. The first set of questions was given at the start of the trip prior to interacting with Haitian educators. Educators were asked to identify expected learning outcomes from the trip and how they expected to measure these outcomes. The next set of questions, a daily reflection, was given after the first and third day of professional development workshops. The final set of questions was administered at the conclusion of the experience. Participants were asked to list their beliefs and attitudes about Haiti and Haitian culture, identify external and internal barriers that would prevent future participation in long-term international activities, and identify changes in their beliefs and attitudes (Wingenbach, Chmielewski, Smith, Piña, & Hamilton, 2006).

Using thematic analysis (Boyatzis, 1998), data was transcribed and coded to identify instances of critical thinking, intercultural competence, and technical competence.

**Results**

The following themes were identified within the educators’ reflections. Coding was used when including direct quotes from the reflections.

**Critical Thinking**

Participant reflections displayed high levels of critical thinking throughout the course of their weeklong experience. Responses such as, “I am still not sure I completely understand all of it-however the one thing I do understand is that change must come from within.” (P1)

**Intercultural Competence**

Participants learned to appreciate Haitian culture, a precursor to becoming competent in that context (Deardorff, 2006). When reflecting on what they had learned participants stated, “there is nothing like immersing oneself into another culture to truly learn from and appreciate it.” (P10)

**Technical Competence**

The week’s reflection exercises highlighted increases in technical competence. When asked how immediate observations from the day would affect their future, participants commented on usefulness of these experience for “when [they] do teacher trainings” (P9) and how it will allow them “to teach workshops to adults” (P6).

**Recommendations and Implications**

Results indicated reflection exercises given before, during, and after the international experiences allowed participants to further explore their beliefs and attitudes towards the Haitian culture. This aligned with the framework established by Gouldthope et al. (2012), which stated the benefits of reflection during international experiences. The results also show a relationship between intercultural competence building and future professional intentions of the educators in this study. Many educators cited growth in their knowledge of Haiti and the Haitian culture and also indicated how their new knowledge and understanding would impact future actions in the classroom in the areas of collaboration, lesson planning, and presentation. These results highlight the innovative use of participation in international professional development as a means to increase intercultural competence, critical thinking, and technical competence for educators. These results may be used to identify benefits of international experiential learning for other educators. The results can also be used as a tool to help planners of such events recruit U.S. educators.
References


Implementing an Innovative Teacher Education and Mentoring Center for In-Service Teachers in the Midwestern United States and Saudi Arabia

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Keywords: Education, Teacher Education, Mentoring, Workforce Development, Instructional delivery methods, Training

**Introduction**

For sustainable technical education and workforce development programs, teacher education and mentoring is an important and necessary aspect to retain these instructors and trainers (Su, Dainty, Sandford, Townsend & Belcher, 2011). Development of teachers is vital to instructor retention, especially in a technical program where the instructor has a broad knowledge base of technical skills, but needs to gain the necessary classroom and training skills required to be successful as an instructor. A structured broad-based approach to professional teacher development will help to nourish a sense of professional commonality and a shared purpose in teaching in the technical skill and workforce development laboratories and classrooms (Rojewski, 2002, & 2004). Historically, there has been a global shortage of professionals who possess both the technical skills and professional teacher education instruction needed for training the students required for the growing high skilled workforce. In conjunction to the workforce demands, the demand for technical teacher education across the country and internationally, has also grown (Gray & Paryono, 2004, Rojewski, 2004). To meet this need, a ground-breaking educational model has emerged.

**Purpose and Objectives**

An innovative model for teacher education has been developed in a regional University in the United States, by providing a modified method of preparing instructors within career and technical education (CTE) and workforce development (The Center). The Center provides progressive teacher education programs and courses, technical skill workshops and mentoring opportunities for teachers and instructors nationally, as well as supporting the needs of students in the King Abdula Scholarship Program in Saudi Arabia.

The objectives for The Center are:

1. To provide teacher education courses and instruction on an annual rotation basis.
2. To provide teachers with opportunities to attend state-of-the-art instructional workshops throughout the region.
3. To provide In-service mentoring for teachers/instructors in any technical or agricultural secondary and post-secondary program by University Faculty.
4. To provide an on-line data base for instructor resource materials and for sharing best practices. The data base will also collect information about users, as well as a collection site for data regarding participants in The Center activities and courses.

**Theoretical/Conceptual Framework**

The theoretical framework for The Center is based upon the framework for professional practice developed by Danielson (1996). The Center would implement a modified method of preparing in-service teachers within CTE and Workforce Development programs. This model includes five components: Competent Instructor; Mentoring; Professional Skills and Knowledge; Technical Competence and Instructor Resources. The model will be presented in a graphical format which will show detailed information for each component, and which provides the framework for collection of valuable data for future improvement and needs assessment. Continued study of this model could provide further resources and innovation to current practice (McCaslin & Parks, 2002).

**Educational Importance and Implications**

The Center delivers instruction at a regional University as well at a satellite campus. Courses are also delivered in hybrid and weekend formats, which provides flexibility in meeting the needs of the students enrolled in both undergraduate and graduate level programs. The Center focuses on outreach not only in the United States, but also to Saudi Arabia. This partnership with the King Abdul scholarship program helps provide Saudi students with technical training in skilled areas, as well as the teacher education training and skill building needed for these students to go back to their country and to be the teacher educators for growing manufacturing and industry in Saudi Arabia and surrounding countries. The educational importance of this model extends far beyond the role of the instructor, it impacts the quality of the students and future workers not only in the Midwestern United States, but also in Saudi Arabia.

The implications for this model of teacher education would be a workforce that would be confident and skilled in the art of teaching and instruction which then would result in retention in their school, college or training center, and help to prevent turnover. Another implication for The Center model, is that by providing different points of access and flexibility in delivery methods, more students could be enrolled in a program, and once completed with teacher certification, could then be employed in a high need technical skill area as an instructor or trainer.

The mentoring model presented in The Center framework could also be implemented in other teacher education and training institutions having implications for change on a global scale. Duplication of this model worldwide has broad implications for the future of technical training and workforce development.

**References**


In search of an Alternative Agricultural Extension Strategy: Action Research on Off-season Vegetable Production in Nepal

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Keywords: Off-season vegetable production, Action research, Nepal

Introduction

The publicly funded, top-down approach that dominated extension services for a long time has been ineffective to revive agricultural growth. Qamar (2005) advised reversal of the traditional extension approach to make it pluralistic, participatory, and demand-driven. Farmers know their contexts better than others; thus, their participation in applied research and extension is important. Participatory action research (PAR) engages researchers and farmers in joint planning, implementation, systematic observation, reflection, and co-learning (McTaggart, 1991; Stringer, 1996). It also offers necessary information to effectively address societal problems.

Nepal is a food-insecure country where 80% of the population resides in rural areas. Farmers practice subsistence agriculture. Nepal has suitable agroclimatic conditions for off-season vegetable production. If developed well, vegetable production can help farmers improve income generation and family nutrition. However, coordinated efforts to develop vegetable production in Nepal are lacking. Employing the PAR approach, a local non-governmental organization (NGO), local farmers, and Michigan State University (MSU) have jointly initiated a vegetable production program in western Nepal. The benefits of action research on small-scale vegetable production have not been fully studied. This study explored the current farming practices followed by smallholder farmers and assessed farmers’ needs and constraints on off-season vegetable production. It is hoped that the findings will be useful for designing future studies on increasing agricultural productivity of small farmers through off-season vegetable production.

Purpose and Objectives of the Study

The goal of the study is to document lessons learned from the participatory action research on off-season vegetable production and develop recommendations for extension. This study aimed to identify the sociodemographic characteristics of participating farmers, determine their current level of agricultural production, identify barriers for adoption of new agricultural technologies, examine farmers’ willingness to participate in the program, and recommend an approach to disseminate new agricultural information and technology to small farmers.
Methodology

Ninety-two farmers were identified to participate in the off-season vegetable production project in Hamsapur Village Development Committee of Kaski district in western Nepal. A baseline survey was conducted in June 2013 using a structured interview schedule. Interviews were conducted by trained enumerators in the Nepali language, and answers were simultaneously recorded in English. Descriptive statistics were calculated to analyze and interpret quantitative data. A few women and leader farmers were interviewed to get better insight into the programs.

Results and Findings

Participants were on average 44 years old. Their average family size, education, and farm size were 5, 8 years, and 1.15 ha, respectively. Half of the respondents (51%) belonged to high castes. Males and younger farmers tended to be more educated than females and older farmers. The majority (74%) indicated males as their household heads, but nearly half (47%) of the respondents said farming-related decisions were made either by females or by both males and females.

Farmers of Hamspur practiced mixed farming--grew cereal crops, fruits and vegetables, and raised livestock for their livelihoods. Among the 20 vegetables they grew, tomato stood out as the main cash vegetable. Twenty-eight out of the 40 growers sold tomatoes and received an average annual income of Rs. 21,981. Tomato was followed by cucumber and cauliflower, which seven (of 26) and four (of 37) farmers sold. Rice, maize, and millet were the major cereals that farmers grew, but these were mostly native varieties and were used for the families’ own consumption. Buffalo dominated the livestock, followed by goats, poultry, cattle, and pigs. Livestock were also predominantly native. Banana, orange, and guava were the major fruits that farmers grew, but few farmers sold them.

The majority of farmers (77%) indicated that they faced barriers to adopting improved technologies. The major barriers were lack of irrigation, markets for farm produce, and information about market prices of agricultural commodities; and difficulty in getting advisory services. Farmers expressed willingness to participate in the action research. Women farmers expressed stronger interest in off-season vegetable production than men. Farmers indicated that the off-season vegetables would create income and employment opportunities locally and discourage youths from leaving their villages for off-farm jobs.

Conclusions and Recommendations

Farmers practiced small-scale and subsistence agricultural production, but off-season tomato production showed promising scope for commercialization, thereby improving farmers’ income. Participants can provide timely information and demonstration to neighboring farmers. Women farmers were more receptive to innovations and the participatory learning approach than men. Provision of agricultural extension services and information on marketing of farm products were the unmet needs of farmers. New extension approaches should focus on training leader farmers, initiating marketing through farmer-managed cooperatives, and increasing collaboration with local research stations.

References

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Incorporation of Diversity Training in Extension Programs: Needs Associated with Colorblindness

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Keywords: Color-blindness, Race, Personal Relationship, Extension, Diversity Training

Introduction
Although less than 5% of legal immigrants to the United States lived in non-urban areas, large amounts of undocumented immigrants continue to work in agriculture (Portes & Rumbaut, 2006). Tighter immigration has been considered in the United States to protect national security, but it can impact the agricultural industry adversely (Lamm, 2013). With more than 231.5 million migrants residing outside of their home country globally, no country is untouched by the issues of immigration (Papademetriou, 2005, United Nations, 2013).

Many current strategies enhancing inter-group relations involve contact with members of different groups to advocate for a color-blind approach (Richeson & Mussbaum, 2004). Color-blind racial attitudes refer to the belief that race should not and does not matter. However, many scholars believe the concept neglects the value and contribution race brings to society (Neville, Lilly, Duran, Lee, & Browne, 2000). Through exploring the relationship between personal experiences with immigrants and levels of color-blindness, international extension educators and communicators can create targeted trainings that emphasize the value of diversity and create a space for more opportunities in the agricultural industry globally.

Purpose and objectives
This study sought to identify how personal experiences with undocumented immigrants and demographics would relate to levels of color blindness. The objectives were to:
4. 1. Describe respondents’ demographic characteristics and their personal experiences with undocumented immigrants.
5. 2. Describe respondents’ level of color blindness.
6. 3. Identify the relationships between respondents’ level of color blindness, demographics and personal experiences with undocumented immigrants.

Methods
The Color-Blind Racial Attitudes Scale (CoBRAS; Neville et al., 2000) was used to measure the level of color-blindness. CoBRAS included 20 statements where respondents rated each on a six-point Likert-type scale (1 = Strongly Disagree, 6 = Strongly Agree). Responses
were averaged to create an overall colorblindness index score. Previous studies show CoBRAS is reliable with Cronbach’s alpha coefficients ranging from .70 to .86. Respondents’ personal experiences with undocumented immigrants were measured by asking if the respondents and their parents were born in the U.S.; if they were a citizen of the U.S.; and if they knew someone who had immigrated to the U.S. and what their relationship was with that person. A panel of experts reviewed the survey for racial bias, legal wording, and survey design to ensure validity.

An online survey was distributed to Florida residents age 18 years or older, using non-probability opt-in sampling (Baker et al., 2013) generating a response rate of 95.4%. Post-stratification methods were used to weigh the data to compensate for potential selection, exclusion, and non-participation biases (Baker et al., 2013). Descriptive statistics, t-tests and ANOVA were used in the data analysis process.

Results

Among 503 respondents, 87.7% self-identified as White, while 6.6% Black, and 7.8% Hispanic/Latino. About half (57.1%) of the respondents knew some immigrants, including friends (19.7%), romantic partners (3.6%), and neighbors (3.2%). Respondents’ level of agreement with the 20 CoBRAS statements on a six point Likert-scale (1 = Strongly Disagree, 6 = Strongly Agree) has a mean score of 3.78 (SD = .72), meaning, overall, they agree with the color-blindness statements.

Respondents considering themselves Hispanic/Latino had a significantly higher level of colorblindness than Non-Hispanics ($t = -2.17$, $p = .03$). Similarly, respondents considering themselves Black had significantly higher levels of colorblindness than White. Respondents who identified knowing immigrant neighbors the most had a significantly higher level of colorblindness than those who identified knowing an immigrant romantic partner the most ($p = .02$).

Conclusions, Implications and Recommendations

Results showed Hispanics/Latino were more colorblind than non-Hispanics; Black respondents were more colorblind than whites. These findings suggested that the Hispanic/Latino and Black populations want themselves to be considered as equal to the majority; but, at the same time underestimated the value of their cultural contributions to society.

Respondents who knew immigrant neighbors the most were more colorblind than those who knew immigrant romantic partners the most, and valued equality between immigrants and natives, but were prone to overlook the importance of the diversity immigrants bring to society. Results also revealed respondents who had a romantic relationship with an immigrant tended to recognize and appreciate the unique characteristics of cultural diversity.

International extension agents need to recognize that race and personal relationship with immigrants play a significant role in perceptions of colorblindness. Diversity training should be incorporated into international extension educational programs to enhance personal relationships between immigrants and extension clientele to help value the contributions of immigrant populations to the agriculture and natural resources industry.

References


Increasing Female Enrollment for Agricultural Programs of Study in Sub-Saharan Africa: What Motivates Women to Pursue Careers in Agriculture?

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Keywords: Agricultural careers; Clubs; Females; Uganda

Introduction

Females in Sub-Saharan Africa (SSA) make up 60% to 80% of the traditional agricultural labor force (Beintema & Di Marcantonio, 2009), and contribute nearly 80% of the overall food production (Ajambo & Synnevåg 2011; Ben-Ari, 2014). Researchers (Beintema, 2006; Kruijssen, 2009), however, have reported low enrollment of females studying agriculture at the post-secondary level. Low enrollment coupled with a high attrition rate (Beintema, 2006) has resulted in a shortage of professional women agriculturists in SSA (Kanté, Edwards, & Blackwell, 2013).

According to Kathleen Lay, “‘[i]nvesting in women’s economic empowerment is a high-yield investment, with multiplier effects on productivity, efficiency and inclusive growth for the [African] continent’” (as cited in Ben-Ari, 2014, para. 17). Empowering females to pursue professional agricultural careers in SSA could increase the likelihood of improving food security and family livelihoods because women are more likely to expend resources on their families than men (Food and Agriculture Organization, 2014). Therefore, the need exists to increase female enrollment in programs preparing them for agricultural careers.

Purpose

This study’s purpose was to explore and derive meaning from the shared experiences of females who were members of Young Farmers Clubs (YFCs) at secondary schools in Uganda, and learn how they were influenced to pursue career preparation in agriculture at the post-secondary level. Two main questions guided this study: (a) What were the participants’ experiences as female members of YFCs? (b) How did the participants’ experiences as members of YFCs influence their decisions to pursue career preparation in agriculture?

Theoretical Lens
This study was framed initially by two theoretical lenses: the theory of planned behavior (Ajzen, 1991) and human capital theory (Hartog & Van den Brick, 2007; Hornbeck & Salamon, 1991; McFadyen, 2006). A third theory, feminist epistemology (Anderson, 1995, 2012; Baber, 1994; Ring, 1987), emerged during the course of the study. Integration of the three theories provided a basis for interpreting the study’s results.

Methods/Data Sources

The phenomenological research method (Groenewald, 2004; Moustakas, 1994) was used in this study. Thereby researchers look for “common meaning of [people’s] lived experiences” (Creswell, 2013, p. 76) to comprehend deeply “the nature or meaning of our everyday experiences” (Van Manen, 1990, p. 9), and finally to distill the phenomenon’s essence (Creswell, 2013; Moustakas, 1994). Seven study participants were purposively selected using snowball sampling (Creswell, 2013; Patton, 1990). The participants were former members of YFCs, and studied or were studying agriculture in post-secondary schools. Tracy’s (2010) eight procedural guidelines were followed to ensure quality in qualitative research. Interviews were conducted via Skype (Bertrand & Bourdeau, 2010; Deakin & Wakefield, 2014) and video recorded using Evaer software. Transcription of interviews was verbatim (Yin, 2011). ATLIS/ti software program was used to develop codes and themes from the data (Creswell, 2013).

Results

Four of nine themes follow that emerged from coding and horizontalization of the data:

**Theme 1: Project-based learning and career awareness**

All participants indicated they applied theories learned in class to real-world settings through supervised entrepreneurial agricultural projects (SEAPs), which reinforced their understanding of agricultural concepts and related careers (Vandenbosch, 2006).

**Theme 2: Acquisition of leadership and other life skills**

Most participants had leadership roles in YFCs which helped them develop leadership, teamwork, financial management, and entrepreneurship skills they still used (Kruijssen, 2009).

**Theme 3: Challenges experienced by females at college and in the agriculture workplace**

Most of the participants indicated they experienced gender discrimination from their male peers at school and on the job.

**Theme 4: Recommendations by the participants on how to increase female participation in agricultural careers**

Participants recommended using project-based learning and field trips for females to learn more about agricultural careers (Kruijssen, 2009).

The phenomenon’s essence was the power of real-world experiences to create agricultural career awareness and the drive to overcome obstacles in pursuit of those careers.

Educational Importance/Conclusions/Recommendations

Students participating in SEAPs and field trips played a critical role in creating positive attitudes toward agriculture. They became more aware of career opportunities, which inspired them to pursue career preparation in agriculture. This supports the work of Mukembo, Edwards, Ramsey, and Henneberry (in press) that encouraged the expansion of these and similar learning experiences through YFCs. Clubs should continue to provide these experiences. Gender
stereotypes associated with females pursuing agricultural careers, traditionally dominated by males, are still prevalent and discourage females from becoming professional agriculturists.

Further research should be conducted to explore the role of socio-cultural norms in this regard.

References


Introduction

Higher education institutions place emphasis on internationalization for students and faculty through global program development for increased academic and professional opportunities (Andreasen, 2003; Dewey & Duff, 2009; Salisbury, Umbach, Paulsen, & Pascarella, 2009). Internationalization efforts include study abroad, faculty research and teaching, and curriculum development (Dewey & Duff, 2009). The University of Arkansas (UA) aims for 25% of graduates to complete an international experience through study abroad programs, internships, research, or faculty-led programs by 2020 (University of Arkansas, 2013). In the college of agriculture at the UA, the current rate of graduates completing an international experience is 3 to 5 percent. Benefits of international experiences for faculty and students include personal and professional development, broadened networks and perspectives, creative thinking, and life-changing experiences (Dooley, Dooley & Carranza, 2008; Lee, Therriault, & Linderholm, 2012; Hand, Ricketts &Bruening, 2007).

Faculty are often responsible for establishing international opportunities for students. Conference participation, visiting researcher or instructor appointments, faculty-led programs for students, and personal experience are ways faculty become involved in international efforts (Dewey & Duff, 2009). However, barriers to faculty engagement include program cost and time commitments (Andreason, 2003; Dewey & Duff, 2009). Additionally, international efforts are not recognized for tenure and promotion decisions at many universities (Dooley et al., 2008), including the UA.

Purpose and Objectives

In August 2013, the UA Dale Bumpers College of Agricultural, Food and Life Sciences (Bumpers College) established an office to support international programs for faculty and students. It was important for the new International Programs Office (IPO) to understand faculty participation in international programs, as well as faculty perceptions and needs for engagement. This study assessed faculty to determine perceptions of benefits to involvement in international efforts, barriers to involvement, and preferences for future global experience locations.
Descriptive survey methodology guided this study. Eleven questions assessed faculty perceptions and experiences in international programs, benefits and barriers to involvement, and recommendations for the IPO. Survey questions were multiple choice with the option to select any that apply. Additionally, faculty were asked to list their preferred locations for international engagement as well as provide recommendations on how the IPO could better meet faculty needs. The Qualtrics disseminated survey was administered to all 173 Bumpers College teaching faculty. Usable data was collected from 85 respondents. All data was analyzed using descriptive statistics. Face and content validity were assessed for by Bumpers College faculty, with representation from each department.

Results and Conclusions
When asked about international engagement (N = 75) in the past 10 years, 76% (N = 57) reported yes, while 24% (N = 18) answered no. Faculty visited European countries most (39%) followed by Asia (22%). When asked where they would like to engage internationally, Europe led faculty responses (49%), followed by Central and South America (21%), and Asia (14%). Faculty said they would like to engage in international research collaboration (83%) and educational purposes (79%). Faculty found international involvement to give value to their departments (89%), students (84%), overall career (84%), college (82%), and research (78%), supporting previous research that faculty support students’ participation, and these programs influence their teaching, research, and career appointments (Dooley et al., 2008; Hand et al., 2007). The strongest barriers for faculty participation in international programs were money (84%) and time (81%), followed by administrative support (30%), which was also found in previous studies (Andreason, 2003; Dewey & Duff, 2009). These barriers are likely a result of the UA not recognizing faculty participation in international programs when making tenure and promotion decisions as supported by Dooley and colleagues (2008) findings. Additionally, limited or inadequate funding may also be impacting program development or expansion.

Recommendations
Because of limited funding, it is recommended the UA and Bumpers College focus funding and program establishment in geographical areas with the strongest connections and interest among faculty. Previous research supports faculty perceived benefits of international efforts (Dooley et al., 2008; Hand et al., 2007); however, international engagement is not recognized in tenure and promotion decisions at the UA. The UA and Bumpers College should include faculty engagement in these decisions to support the declared value for international experiences. In order to meet the established goal of 25% student participation in international experiences by 2020, the UA must seek financial opportunities for faculty engagement abroad to assist in organizing programs for students. Further research could provide insight on how the university could consider faculty international experiences for tenure and promotion decisions and acquire increased funding for faculty global efforts. These are similar issues many universities are facing globally.

References


Mainstreaming Value Chain Orientation in a B.Sc. Curriculum for Frontline Agricultural Extension Professionals in Ethiopia

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Keywords: Value chain, Mid-career extension professionals, In-service training.

Introduction
There is a growing realization that small-scale farmers in Ethiopia can increase their incomes substantially by processing and adding value to their produce (Mandefro, 2009). Part of the reason why the farmers do not engage in value addition is that, historically, the extension services in the country have been focused on improving production (Gebremedhin et al., 2006). Extension services are structured for this production focus. University training also has a strong production orientation. As Sutz (2005) points out, universities are socially embedded, and their guiding visions are influenced by traditions. This situation is therefore self-reinforcing – the extension service’s production focus influences training at universities, and training at universities determines what extension can do. The result is that extension services are not trained to provide advice beyond production (Alemayehu, 2009). To break this cycle, employers usually need help to communicate their needs to universities. This is particularly true with public agricultural extension systems, most of which believe ‘things are generally OK as they are’, and they take what they are given by universities.

Purpose and objectives
In a move towards value chain-oriented agricultural extension, a training needs survey was conducted to determine (a) the current level of farmer participation in post-production activities; (b) the training needed for frontline extension workers to provide advice beyond production; and, (c) the profile of the expected graduate.

Methodology
The survey was done within the context of an ongoing in-service B.Sc. degree program for mid-career extension professionals run at six universities in partnership with the Ministry of Agriculture and Saskawa Africa Fund for Extension Education. Data were collected from a stakeholder workshop attended by 37 participants and through individual interviews of 69 employer representatives, 229 frontline extension workers and 300 small-scale farmers. Descriptive statistics was used to analyze the data. A draft curriculum was proposed and reviewed by an expert reviewer. The survey report, the proposal and the reviewer’s report were presented to a national validation workshop attended by 75 stakeholder representatives. The workshop reviewed the proposal with respect to: relevance of the program; relevance of the courses; and, feasibility of the mode of delivery. Recommendations from the workshop were then given to an inter-university panel of experts to finalize the curriculum.
**Results of the survey, discussions and conclusions**

The survey revealed that farmer post-production activities were largely limited to storage and marketing, with very little processing and value addition of commodities like coffee, hides and spices. The survey found that opportunities, constraints and challenges along value chain were commodity-specific and identified two thematic areas that needed to be added to the production courses of the B.Sc. program. These were: (a) animal products processing (small-scale processing, storage, transportation, grading, packaging, safety, quality assurance); and, (b) crop products processing (small-scale processing, threshing, storage, transportation, grading, packaging, safety, quality assurance). These were to be supported by generic courses like value chain in agriculture; and, quality assurance and standardization of agricultural products. The demand from both farmers and employers was for a generalist extension worker capable of providing extension services along commodity value chains. They argued that smallholder farmers were generalists and needed extensionists who are able to provide advice as they need it. The survey resulted in a revised value chain-orientated curriculum and the production of a wide range of training modules now being used in six universities. However, it was observed that the curriculum was weak on pastoral issues and that it would be difficult to cover all farming systems in one program. A separate needs survey has since been done for pastoral areas and two universities are currently preparing to launch a pastoral-oriented version of the B.Sc. program for mid-career extension professionals.

**Recommendations**

Contrary to the ‘ivory tower’ phenomenon that used to characterize institutions of higher learning, universities in Ethiopia demonstrated that they can respond to well-articulated needs. As Mutimba et al. (2010) point out, the role of universities is to ensure that the wheels of agricultural production are well oiled with necessary knowledge and skills throughout the entire value chain. They should therefore always stay abreast of the needs in the industry to ensure that their curricula remain relevant. Curricula should be dynamic and flexible to respond to changing and emerging needs. The results of the survey also point to the need for extension organisations and training institutes to come up with life-long learning programs that allow internal re-tooling of extension practitioners and faculty staff to develop their capacity to cope with emerging demands.

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Managing Pluralistic Extension Systems in the Dynamic Environments of Sub-Sahara Africa

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Keywords: Extension, Management, Toolkit, Pluralistic, Africa

Introduction

Many Sub-Sahara African countries have experienced major reforms in their extension systems, in part, due to failure brought about by lack of dedicated resources, poor management and lack of well-trained extension staff (Global Forum for Rural Advisory Services, 2014). Without new approaches to managing pluralistic extension systems, these reforms will not lead to significant improvements in food production and security. A pluralistic extension management system should include the development of local extension management capacity (Hemmskerk & Davis, 2012). Extension agents must not only be adept at technical agricultural skills but be able to collaborate with multiple providers and manage varying information sources.

Purpose and Objectives

The purpose is to better equip extension agents to be innovators of change within a dynamic pluralistic system and provide decision makers with the resources and tools they need to make quality decisions regarding extension policies and programs. A conceptual framework that addresses the managerial challenges in transforming from the previous system to new extension settings characterized by multiple providers will be presented. The conceptual components are supported by various case studies in Ghana, Uganda and other Sub-Saharan countries and include lessons learned and tools suitable for educators and leaders within innovative management systems.

Theoretical/Philosophical Themes

The framework focuses on two of the managerial levels affected by a pluralistic system. One is the service providers who are not only providing technical expertise to farmers, but are also establishing relationships and platforms in which multiple providers can partner. Gender related issues will be addressed, since investing in policies that affect women farmers specifically could lead to a positive impact on African crop and livestock production (O’Sullivan, Rao, Banerjee, Gulati & Vinez, 2014).
The second targeted group is policy makers including managers of public extension systems, councils and non-public extension service providers (NGOs and private sector) and other decision-making leaders. Although over 90% of Sub-Saharan Africa’s poor are involved in agriculture, a lack of investment and support from policy-makers has affected Africa’s ability to reach its agricultural potential. (O’Sullivan, et al., 2014). Therefore, covering information needs of policy makers and providing advocacy for change management and increased investment required for effective and efficient management of pluralistic advisory systems and its services is an important component of the conceptual framework and managerial tools presented. dThe managerial recommendations made are adaptable to other countries with similar pluralistic extension systems and will later be expanded to more countries and regions.

**Product**

Based on the aforementioned needs, general guidelines and recommendations will be presented. The final product that is now in process is to design and produce a comprehensive management toolkit and subsequent online modules. The recommendations and tools to be presented and ultimately the toolkit are organized according to the conceptual framework provided, including result-based management for planning, organizing, leading and monitoring and are based on the evaluation criteria of relevance, efficiency, effectiveness, impact and sustainability. The planning function includes program development, strategic planning, and various aspects of human resource management. Tools for organizational development and time management are provided in the organizing function. Summarized in the leading function are guidelines for vision building, decision making, conflict management, innovation, communication and thriving in changing environments. Recommendations categorized in the monitoring function included establishing performance measures, assessments and learning cycles. The basic management functions will be developed for an innovative system that requires flexibility, responsiveness to various stakeholders and the adaptation of new technologies.

**Education Importance and Application**

Linear models that were used in previous extension education systems must be replaced by more complex and dynamic systems characterized by relationships and innovation systems (Christoplos, 2010). The conceptual framework and managerial toolkit with components for both service providers and policy makers will provide needed tools to facilitate change and equip service providers for their redefined role.

**References**


Motivations for Participation in an International Experience: Perspectives of Students Enrolled in a College of Agriculture

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**Keywords**: International Experience, Study Abroad, Motivation, Perspective, Students

**Introduction**

International experiences are an important part of higher education and impact students personally, professionally, and academically. Recognizing the importance of global understanding and the desire to increase international exposure for students enrolled in agriculture is not new. Multiple studies (Connors, 2004; Harder, Lamm, Roberts, Navarro, & Ricketts, 2012; Hunter, 2004; Wingenbach et al., 2003; Zhai & Scheer, 2004) show the need for students to gain international experience.

However, according to the 2013 Open Doors Report, participants from colleges of agriculture have declined and still comprise a very small percentage of United States students choosing to participate in an international experience. The development of effective international experiences requires an understanding of students’ preferences and the identification of factors that motivate them to participate. The framework for this study was based upon the theory of planned behavior (Ajzen, 2006) which articulates that behavioral decisions are based upon beliefs that can be behavioral, normative, or control. It is critical to understand student beliefs to successfully encourage participation in an international experience.

**Purpose and Methodology**

The purpose of this study was to document perspectives of international experiences for students enrolled in a college of agriculture. The instrument was based upon the work of Briers, Shinn, and Nguyen (2010). Respondents were asked about participation in international experiences, preference for various program characteristics, motivation to participate, the importance placed on various program aspects, foreign language ability, and time lived outside of the state and country. The instrument utilized a combination of multiple-choice, ranking, and Likert-type questions. Survey methodology was implemented and a total of 194 students, in select courses at Texas A&M University, completed the instrument. This presentation will synthesize the influence of program type, length and location and identify the motivations and perceived barriers to international experiences for students enrolled.

**Results and Conclusions**
The surveyed students included 123 females (63%) and 71 males (37%). The majority of respondents (87%) spoke English as their only language and only 7% had lived outside the United States. Additionally, the group was comprised of 31 agricultural science students (16%), 57 agricultural leadership students (30%), 55 agricultural communication students (28%), and 38 general agricultural studies students (20%). Two-thirds (69%) of the students were in their junior or senior year of college.

Findings revealed that 119 of the 194 students (61%) had participated in an international experience. Of the 75 students without an international experience, only 19 had no interest in pursuing an opportunity. The students preferred study abroad programs facilitated by their home university and international internship opportunities. They favored service learning and non-academic field trips hosted by their home institution over study abroad programs hosted by other universities. Additionally, students indicated that they preferred programs lasting three to six weeks followed by programs of one to two weeks. Australia and Italy were cited by more than 70 students as highly desired countries to visit. Additional preferred countries were all located within Western Europe: Spain, France and the United Kingdom. It was concluded that the majority of students saw value in gaining an international experience but preferred travel to a developed country that was coordinated by their home institution. This supports findings from Danjean, Bunch, and Bruchhaus (2014) that indicated student preference for travel to a developed country.

Strongest motivators for students to pursue international opportunities included an enhanced life experience which supports previous research by Bunch, Lamm, Israel, and Edwards (2013). An additional motivator was increased employability. Cost was the most dominant factor related to program selection. However, country to be visited, subject matter, and cultural attractions in the area were also indicated as very important by the students. It was concluded that careful attention must be paid to program cost and destination.

**Recommendations, Educational Importance, and Implications**

As educators strive to provide international opportunities for students, it is important to be aware of students’ perspectives and the factors that influence their participation in international experiences. The results of this study indicate the need for colleges of agriculture to provide their own study abroad and internship programs for students. In addition, the desire to visit developed countries reveal that while students have an interest in gaining an international experience, they are not necessarily open to all possibilities. Given that behavioral decisions are often based upon beliefs (Ajzen, 2006), it is critical to recognize student beliefs regarding international experiences and shape programming in a way to address these beliefs.

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Nigerian Agricultural Education and Training Faculty Perceptions of Cooperative Learning

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Keywords: Cooperative learning, Agricultural education and training, Nigeria, Instruction

Introduction

Educator quality and functional education systems are pivotal to the growth and development of any nation. Globally effective Agricultural Education and Training (AET) instructors are needed for the implementation of authentic learning opportunities which assist students in mastering the foundations they will need as productive persons in an agricultural system (Ayonmike, Okwelle, Okeke, 2013). Implementing high quality professional development for postsecondary Agricultural Education and Training instructors is a critical step in facilitating inclusive economic development in Nigeria (Okoedo-Okojie & Edobor, 2013). Most technical agricultural programs in however Nigeria do not include training in instructional methods, creating lesson plans, or assessment techniques and lecturers are usually forced into learning the craft of teaching through trial and error. Unfortunately, poor teaching and a lack of innovative strategies do little to break the status quo view that agriculture is a distasteful option for youths.

Cooperative learning has been and continues to be one of the most successful methods of instruction and it is well supported by hundreds of validating research studies (Johnson & Johnson, 2009). Cooperative learning is widely used across the globe at all levels of education and in a wide variety of subject areas (Johnson, Johnson, & Smith, 2014; Schunk, 2008). Further, cooperative learning has been found to promote: a) higher levels of achievement; b) more frequent use of higher level reasoning strategies; and c) serve as an effective means for building interpersonal bonds and team identity. Synthesizing research surrounding social interdependence that took place over a thirty year period, Johnson & Johnson (2009), were able to modify and extend social interdependence theory in two distinct ways: 1) they were able to identify and validate variables that mediate the effectiveness of cooperation; and 2) by investigating numerous independent variables they were able to expand the scope of the theory. Based upon their research investigating the implementation of cooperative learning, Johnson and Johnson
(2009) have posited that five variables or tenets mediate the effectiveness of cooperative learning: 1) positive interdependence; 2) individual accountability; 3) promotive interaction; 4) appropriate use of small group social skills; and 5) group processing. In order to ensure success when implementing a cooperative learning model, all five tenets should be enacted and attention should be given to their sustainment over the duration of the student learning experience. Data suggest that a cooperative learning model is optimized when it is consistently utilized over an extended period of time and it is integrated completely into the majority of student learning experiences.

**Purpose / Methods**

The purpose of this descriptive study was to create information about how AET faculty in Nigeria perceived cooperative learning. The objectives of the study were to assess participants':

a) experiences with the workshops that employed a cooperative learning model of instruction

b) beliefs regarding the efficacy of cooperative learning as a model for instruction

c) self-perceived knowledge of cooperative learning as a model for instruction

d) beliefs regarding their ability to utilize cooperative learning as a model for instruction

The current research project was undertaken as part of a customized three week professional development institute for 40 AET faculty in Nigeria. Researchers utilized a cooperative learning model during the implementation of workshops designed to: a) improve the instructional ability of the AET faculty; and b) build the capacity of the AET faculty to utilize instructional technologies and software applications. In all, nine of the 24 workshops that were taught over the three week institute utilized a cooperative learning model. Research participants completed an online survey instrument consisting of 42 separate items in three categories, which were matched to the research objectives.

**Results / Recommendations**

Overall, the participants found the workshops that employed a cooperative learning model to be more effective than the other workshops. The participants also found that the content for the cooperatively framed workshops was easier to understand and they attributed that improved understanding to the methods of instruction. The participants also perceived that they were able to participate more and engage the content more deeply in the cooperatively framed workshops.

The data also reveal that while the participants believed that cooperative learning was a robust model for instruction, they believed their level of knowledge and ability to implement a cooperative learning model were moderate to low. It is recommended that more efforts be directed at implementing cooperatively learning in AET programs of study in Nigeria and a cooperative learning community of practice be established to foster peer to peer professional development.

**References**


Outcomes of a Study Abroad Program: A Qualitative Approach to Three Domains of Holistic Human Development

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Keywords: Study Abroad, Namibia, High-Impact Experience, Qualitative, Student Development, Cognitive, Intrapersonal, Interpersonal

Introduction
Study abroad programs are increasing in prevalence, and a record number of students studied abroad in 2013 (Institute of International Education, 2013). Study abroad programs have been shown to have positive impacts on students in agricultural disciplines (Zhai & Scheer, 2002; Black, Moore, Wingenbach, & Rutherford, 2013). Additional research documenting the nature of the impact these programs have on student development is necessary (Chieffo & Griffiths, 2004; Hovland, 2009). The Global Perspectives Inventory (GPI) was developed to measure student development (Braskamp, Braskamp, & Engberg, 2013) with a form specifically designed for students who study abroad. The GPI measures student development across three domains: Intrapersonal, Interpersonal, and Cognitive (Braskamp et al., 2013). Implementation of the GPI as a measure for change in students who study abroad has been implemented at [university] since 2010, and students who study abroad have been shown to be statistically different in each of the three domains ([University] Office of Institutional Assessment, 2013). Qualitative approaches often follow quantitative studies to determine how people make meaning and interpret experiences (Merriam, 2009). Authors of the GPI offer recommendations to instructors on how to encourage and interpret the student development in each domain (Braskamp et al., 2013), but less research exists on how students understand and interpret their development. How do students self-perceive their intrapersonal, interpersonal, and cognitive development as a result of a study abroad program? How do students say they changed?

Purpose and objectives
This study sought to explain student perspective on development in three domains as a result of a study abroad program. Objectives were to A) identify specific change outcomes resulting from studying abroad B) explain those outcomes in the context of the domains measured by the GPI.

Methods
A qualitative phenomenology, comprised by semi-structured interviews and the constant comparative method, was implemented to “depict the essence” (Merriam, 2009, p.25) of change as a result of a study abroad. Purposive sampling was utilized to select students who participated in a study abroad program focusing on agriculture and natural resources in Namibia. Semi-structured interviews were conducted. Questions were designed to generate responses about how students changed relative to interpersonal, intrapersonal, and cognitive domains. After pilot interviews were conducted, participants (N=10) were interviewed to the point of data saturation (Merriam, 2009). Data was analyzed using the constant comparative method.

**Results**

Interview responses were categorized according to each of the three domains. Analysis revealed 18 outcomes relative to the intrapersonal domain, including outcomes specific to identifying purpose (“I solidified my career goals”) and understanding skills and strengths (“I am more mature”). Fourteen outcomes relative to the interpersonal domain were identified, including outcomes specific to social interactions (“I am more comfortable interacting with people I don’t know”) and social responsibility (“I am better at conflict resolution now”). Analysis revealed 13 outcomes relative to the cognitive domain, including outcomes specific to thought processes (“I am better able to prioritize activities now”) and knowledge gain (“I learned how to do research and test an idea”).

**Recommendations**

Students who study abroad are different from the general population ([University] Office of Institutional Assessment, 2013) across each of the three domains measured by the GPI. These data provide an explanation on how that difference is manifested, and explain specifically how students change; 45 specific outcomes were generated from the results.

Each outcome describes a deliverable that students attribute to participation in a study abroad program. As such, these data can be used as benchmarks and measures of effectiveness in study abroad facilitation.

Practitioners should incorporate these outcomes in planning activities and assignments for study abroad programs, to further cultivate the impact on positive outcomes, and to more effectively recruit participants.

The 45 outcomes generated from this study should also be incorporated into other research, including factor analysis and model development studies. Additional comparisons are needed with populations in other study abroad programs and other universities, as well as other high-impact experiences.

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Perception towards Supervised Experiential Learning Projects (SELPs) among Mid-Career Agricultural Professionals in Uganda. The Case of the Bachelor of Agricultural and Rural Innovation, Makerere University.

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Keywords: Supervised experiential learning projects, Mid-career agricultural professionals

Introduction
Uganda’s agricultural sector and general welfare of the nation relies heavily on mid-career agricultural professionals who work on a daily basis with various farming communities. Most of these professionals however hold very low academic qualifications which render them ineffective as change agents in modern agricultural farming systems. A more effective educational program therefore that called for a more experiential approach to learning and teaching (Creamer & Winston, 2002; Knowles, 1984), BARI was critical to bring back mid-career professional groups who were at risk of social exclusion develop identities that enable them to engage with learning (Gallacher, Crossan, Field & Merrill, 2002). The Bachelor of Agricultural and Rural Innovation (BARI) was designed to enhance professional innovativeness in agriculture and rural development for mid-career agricultural professionals in Uganda. Through its Supervised Experiential Learning Projects (SELPs), BARI provides an opportunity for the professionals to engage with rural communities and acquire skills’ training in a changing workplace in order to appreciate the complex nature and unilinear approaches to learning (Jarvis, 2004; Crossan, Field, Gallacher, & Merrill, 2003) outside the formal classroom settings (Wlodkowski, 1998). Though this is the case, no studies have been conducted to determine the real benefits of SELPs to the professionals and how the professionals cope with challenges of the changing workplace environment to improve their efficiency and effectiveness as change agents.

Purpose and Objectives
The general purpose of the study was to determine the perceptions of the mid-Career agricultural professionals towards Supervised Enterprise and Learning Projects (SELPs) and its relevance to their job requirements in Uganda.

Methodology
The study was a descriptive survey and targeted mid-career professionals enrolled in BARI for the period 2010-2011 (n=100). The study subjects were identified through the list of students that enrolled into the BARI degree in the Department of Extension and Innovation Studies. A self-administered questionnaire was the basic data collection instrument and included open- and closed-ended responses to determine the relevance of the SELPs in imparting work-
related skills to mid-career professionals with a response rate of 80%. A split-half reliability test was conducted to test the reliability of the questionnaire.

**Results and Conclusions**

The respondents of the study had a diversity of educational and work experience in agriculture and other related disciplines. However, the SELPs experience was a unique experience to all respondents. SELPs was designed to provide agricultural professionals an opportunity to share their newly acquired agricultural knowledge and skill in exchange for an opportunity to work on specific projects in agricultural-related working environments with host organizations. The professionals worked with host organizations that had well-established administrative structures and well-defined chains of command as noted by 80% and 76.6% of the respondents respectively. An elaborated formal administrative structure therefore enabled the host organizations to develop well-organized activities for successfully implementing the SELPs as noted by 61.7% of the respondents.

With increased support from host staff (81.7%), the SELPs experience portrayed a learning environment that promoted teamwork (83.3%), confidence building and networking (71.7%) among the professionals. The SELPs learning experience further provided an opportunity for the professionals to interact and support joint learning with diverse farming communities. Coupled with the support from the worksite supervisors, a bigger proportion of respondents (81.7%) acknowledged a conducive working climate that made it easy for them to readily acquire technical and other people-related skills.

Challenges were inevitable with the SELPs experience. The greatest challenges that the field extension workers faced during the SELPS was the lack of sufficient time (93%) and funds (90%) to work through a problem and implement the solution as was required by the problem solving approach. Further, half of the field extension workers indicated that there was no provision to follow up these projects once the professionals returned to school to write out their SELPs reports.

**Recommendations and Implications**

SELPs served as learning platforms for mid-career professionals that enrolled into the BARI programs. SELPs offered an avenue for the professionals to interact with farming communities and learn other people related skills. SELPs also offered an opportunity for the professionals to indulge in real life learning experiences and test the work environment in which they would work after graduation. The host organizations too had a chance to interact with the university and thus strengthen the collaboration between universities and other development partners. However, SELPs should be given enough time and funding to enable effective implementation of student proposed projects. In the same spirit, there should be mechanisms for continuity of these projects when professionals return to the university.

**References**


Perspectives of Extension and Research Faculty towards Integration of Extension and Research activities at a Land Grant University in India

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Introduction
The concept of integrating Extension and research dates back to the enactments of the Morrill (1862) and Smith-Lever (1914) Acts. The rationale was that new research conducted in labs and other facilities is transferred into practice via Cooperative Extension and in turn problems faced by farmers are conveyed to the researchers to improve it further (Hamilton, Chen, Pillemer & Meador, 2013).

A number of scholars (Bitsch & Thornsbury, 2010; Decker, 2004; Gould & Ham, 2002; and Hamilton et al. 2013) have examined challenges and opportunities associated with Extension-Research (E-R) integration activities. Consensus from these studies suggests varying views for E-R integration.

Indian agricultural universities were established under U.S. land grant model in the sixties, and they also experienced problems with integrating research and Extension (Pal & Byerlee, 2006). Furthermore, literature relative to E-R integration activities in India is scarce.

Purpose and Objectives
The overall purpose of this study was to explore the current status of Extension-research (E-R) integration activities in the University of Agricultural Sciences (UAS), Bangalore, India. Specific objectives of the study were to:

1) Determine perceptions of Extension and research faculty regarding integration activities;
2) Describe the roles of Extension and research faculty in E-R integration activities;
3) Identify barriers to E-R integration activities; and
4) Determine strategies for strengthening E-R integration activities

Methodology
This study used a descriptive, cross sectional survey design. The target population consisted of all faculty (N=80) who had joint appointments in research and Extension in the ten departments at the University of Agricultural Sciences (UAS), Bangalore, India.
A five-section instrument was developed to collect data. The questions were based on earlier studies (Radhakrishna, Tobin, & Foley, 2014) and in consultation with experts from UAS, Bangalore in India. Section one contained 11 statements on current status of E-R integration, Section two contained 10 statements regarding faculty roles. Section three contained seven statements regarding barriers to E-R activities. Section four contained 10 statements regarding strategies to strengthen E-R integration. All 38 statements were measured on a five-point Likert scale. The final section of the instrument elicited demographic information.

Face and content validity of the instrument was established using a panel of faculty with international experience. A post-hoc reliability analysis found that the instrument to be reliable (alphas ranged from a low of .64 to a high of .88). The study was approved by the Institutional Review Board of the [state] university.

Dillman’s total design method was used to collect data (Dillman, 2000) which included a pre-notification e-mail and two follow-ups—personal requests and reminder e-mails. In all, a total of 44 faculty responded (55.0%). Non-response error was addressed by comparing early and late respondents as per procedures suggested by Miller and Smith (1983). Descriptive statistics were used to summarize the data.

Results

Faculty either ‘agreed” or “strongly agreed” that E-R integration is important for: successful agricultural development ($M=4.77$, $SD=0.42$); creating new insights to agricultural research and Extension ($M=4.63$, $SD=0.49$); addressing critical issues facing agricultural community ($M=4.50$, $SD=0.59$).

Regarding faculty roles, faculty agreed that: extension is serving as a link between the university and the public ($M=4.61$, $SD=0.62$); research faculty motivated by discovery/innovation ($M=4.36$, $SD=0.72$). However, faculty “disagreed” that research faculty only looks at the research process, not its application at the local level ($M=2.80$, $SD=1.15$).

Major barriers to E-R integration were: lack of funding for integrated activities ($M=3.20$, $SD=0.95$); lack of communication between Extension administration and research faculty ($M=2.93$, $SD=0.97$) and department heads ($M=2.84$, $SD=1.06$).

Faculty “agreed” that the following strategies will help strengthen E-R integration: establishing a strong working relationship among research and Extension administrators ($M=4.52$, $SD=0.55$); establishing integrated Extension-research centers at the local level ($M=4.43$, $SD=0.70$); and networking among Extension and research faculty ($M=4.36$, $SD=0.65$).

Conclusions

The findings of this study suggest that faculty have varying views toward E-R integration. They view integration as a positive, much needed undertaking at agricultural universities to promote agricultural development and address critical issues facing Indian agriculture.

Need exists for developing a mechanism to integrate Extension and research at the university level to address critical issues facing Indian agriculture. The strategies and barriers identified in this study should be addressed in order to move forward with integration efforts.

Recommendations and Implications
E-R integration will help develop better institutional mechanisms for connecting innovations in research and new knowledge developed to farming communities who are the consumers of that knowledge. A framework for E-R integration is proposed.

It is recommended to establish an Extension-Research Integration Center at university level. The goal of this Center should be to identify, develop, implement and evaluate Extension-research integration efforts.

References


Provision of Private Extension and Advisory Services: Case Study Lessons from Brazil

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Keywords: Private extension, Brazil, Reforms

Introduction
Brazil undertook reforms of public extension in the 1990s to meet technical assistance needs of small-scale farmers. Brazilian extension thus became highly pluralistic with over 400 agencies, including the state, farmer associations, cooperatives, trade unions, companies, and non-governmental organizations. While this approach is impressive, the impact and returns to reform efforts are largely unknown.

This study documents a case of services provided by the private sector (GFRAS, 2012). The public system, centered on state extension agencies (EMATER), is designed to integrate smallholder farmer services with other EMATER rural development programs (Bortolotti, 2014; Sepulcri, 2005). However, the additional tasks for the limited number of agents has led to poor reach of services. To fill this gap, private extension emerged in the pluralistic extension system (Deponti, 2011; Peixoto, 2009; Sette and Ekboir, 2013).

Purpose and Objectives
In developing countries, the relationship between private sector output aggregators and input supply companies and farmers is not well documented, nor are the advantages and disadvantages. This case study examines Rio de Una (RdU), a private vegetable processing company in Parana, to better understand the role of private actors in providing extension to small-scale farmers, and to document the lessons learned from RdU’s technical assistance packages. This will help Brazil and others to better manage pluralistic rural extension and allow the private sector to play a role in linking farmers to market and increasing incomes.

Methods
The framework for analyzing extension, based on Christoplos, Sandison, and Chipeta (2012) and OECD (2010), considers six variables: relevance, efficiency, effectiveness, equity, sustainability, and impact. The authors used participant observation, field visits, key informant interviews, and document review to collect data. The information collected reflects facts and perceptions from providers (public and private organizations), managers of the process (private and public organizations), and those who received services (small-scale farmers).
data collected were transcribed and analyzed using coding categories, such as common themes, setting and context, respondent perspectives, relationships, and social structure.

Results

The relevance of private services comes from the need for high quality produce that meets purchasing company requirements. The system was considered efficient since it focused on farmers whose needs for crop production were well-defined and their goal was clear. In terms of effectiveness, agents were able to assist farmers throughout the season. Private extension was seen to increase the level of equity in the delivery of services, since it addressed the gap in technical assistance left by the public system. The sustainability of the private system was undermined because the needs of farmers not under contract with the company had to be met by the public system. Private extension agents from RdU made an impact by successfully transforming farmers from conventional to organic agriculture to meet market demands.

Conclusions and Recommendations

The experience of Rio de Una shows the gap in Brazil’s extension system that could be filled by the private sector. Farmers under contact with RdU benefited from assured markets and reduced uncertainty in prices. These farmers received intensive technical assistance while adding value to their commodities. RdU was able to effectively capture the demand for select products; however, the company was not able to fully implement this transformation since market demand was not high enough. Thus, the company adapted operations to reach both traditional and organic markets. While this model worked for innovative farmers, it did not reflect the needs of all small-scale farmers. This case study reveals that private services provided by companies offer a viable alternative to public extension systems for small-scale farmers able to undertake a contact with a private sector company.

References


Public Issues Education as a Method for Agricultural Change

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Keywords: Public issues education, Partnerships, change theory, Managing change, Training and development

Introduction
Diffusion of innovations in agriculture has become increasingly difficult. Fortunately, research and ongoing practice show us that extension efforts are still effective change methods. A review of recent research provides evidence that extension is effective in technology transfer (Kock, Hafer, Smith, & Turnbull, 2014; McDermott, Murphrey, & Wingenbach, 2013), encouraging farmer groups (Malima, Blomquist, Olson, & Schmitt, 2014; Okorley, Adjargo, & Bosompem, 2014), general education (Cai, Rodriguez, & Abbot, 2014; George et al., 2014), and many more aspects that support agricultural advancement. A relatively new change effort in agriculture and natural resources (ANR) is public issues education (PIE).

PIE as a program area was first conceptualized at the University of Florida in The Institute of Food and Agricultural Sciences; it is now successfully functioning as the Center for Public Issues Education (UF/IFAS Center for Public Issues Education, n.d.). PIE is an umbrella term used to describe the research of ANR issues based on public opinion research. Further, it includes providing research findings to stakeholders and the general public and providing education and training for those audiences. Faculty members can collaborate with PIE faculty to enhance their extension efforts. Extension agents and PIE faculty can collaborate to create trainings for target audiences. The end goal of PIE faculty is to encourage positive change in the field of agriculture.

Purpose/Objectives of the abstract
The purpose of this abstract is to describe the role of PIE as a method for creating positive change in the field of agriculture. Objectives include: (a) describe research collaboration opportunities, (b) describe programming collaboration opportunities, and (c) describe relationship-building opportunities.

Philosophical themes
“Change is a shift or move to something different” (Komives & Wagner, 2009, p. 101), is positive in nature, and founded on knowledge acquisition (Rogers, 2003). The first stage in creating change is knowledge (Rogers, 2003) and PIE faculty contend with numerous external information sources that can have equal or more influence on learning (Bandura, 1977). This highlights the importance of credible, timely information. Unfortunately, extension services can be a lengthy process. Rogers (2003) describes the agricultural extension model as a trickle-down system that consists of researchers, extension specialists, and extension agents. A goal of PIE is
to be proactive in ANR issues research and create programming before misinformation is perpetuated.

Lindner and Dolly (2012) proposed the need for extension to address important contemporary issues. The nature of PIE aligns with this need and is an ideal collaborator with extension professionals. Public issues education is designed to respond quickly to agricultural issues. A combination of ongoing data collection and timely dissemination of information via websites, training workshops and other informational channels keeps PIE faculty informed of the most current ANR issues. It is critical for PIE faculty to remain grounded in research-based information, unbiased, and ready to respond to agricultural fads (Lindner & Dolly, 2012).

PIE faculty must understand their clientele to facilitate the learning process through participatory learning (Boone, Safrit, & Jones, 2002; Lindner & Dolly, 2012); this process increases clientele capacity and creates trusting relationships. PIE faculty must also create global partnerships (Lindner & Dolly, 2012). These partnerships can lead to funding, research, and resource opportunities. Responsible resource stewardship and transparent reporting create pathways for long-term relationships, additional resources, and general credibility (Lindner & Dolly, 2012).

Conclusions and Recommendations

It can be concluded PIE is a viable method for creating positive change in agriculture. Collaboration between PIE faculty, extension, academic faculty, and agricultural organizations can influence maximum change. Outreach must be grounded in research-based information (Lindner & Dolly, 2012); the proactive, issues-focused research efforts of PIE will allow extension agents access to current research to mitigate ANR issues before they escalate.

It can also be concluded that these collaborations will lead to solution-focused programming. These collaborations provide a multifaceted view of ANR issues and will lead to multifaceted solutions. The key for these collaborations is timely action; we must respond to misinformation before it spreads. Relationships must also be trustworthy (Lindner & Dolly, 2012; Rogers, 2003). The mission of PIE is rooted in public relations and is an opportunity for agricultural groups to create and foster trusting relationships within agriculture and the public.

Application for AIAEE Members

Collaborations with public issues education faculty holds opportunities for creating change at the organizational levels in agriculture and with the public. PIE faculty are an exciting resource for extension and academic faculty in terms of access to current public opinions of ANR issues. Collaborations can lead to active dissemination of accurate ANR information to agricultural organizations and the public. It is important to note that PIE faculty do not necessarily hold teaching or extension appointments; communication is critical for project planning.

References


Self-Identity of Bi-Racial Students: Implications for Educational Programming by Agricultural and Extension Educators

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Introduction

One of the fastest growing student groups today is the biracial student population. This trend is predicted to continue. In fact, it is estimated by 2050, one in five new students will identify him/herself as bi/multiracial (Brown, 2009). How one identifies racially impacts how one is perceived by others and how one perceives him/herself in society. While race is often thought of as static (Gossett, 1997) and is used to delineate group membership, researchers of identity theory suggest biracial individuals may identify along a continuum of racial identities (Root, 1996, Renn, 2008, Rockquemore & Brunsma, 2002, 2008).

Several racial identity theories have been developed and studied. Rockquemore & Brunsma (2002) propose a “mixed race” identity model with four categories: a border identity where individuals define themselves as belonging to a third and separate blended category typically called “biracial;” a singular mono-racial identity where individuals identify with the race of one of their parents; a transcendent identity in which one rejects the notion of “race” and its categories all together; and a protean identity in which individuals change their racial identity as they move from group to group and through the various social contexts of everyday life.

Purpose of the Study

This study was part of a larger descriptive exploratory study on biracial college students and focuses on factors related to students’ parental/family upbringing, specifically the extent to which parents socialized their biracial children in the cultures of both parents while growing up and how these students chose to racially self-identify.

Methods

Biracial students at a large predominantly white research university in the northeastern United States completed an on-line survey developed by the researcher based on a review of literature. The 121 item instrument included Likert-type scale items, forced choice, and open-ended questions. The items were reviewed for face validity by a panel of experts in research methodology, diversity education, and student affairs. A pilot test of the instrument by biracial students who were not included in the study resulted in final adjustments to the instrument. An email invitation to participate in the study was sent approximately 1500 students at the
university who had selected the racial category “two or more races” on their college admissions form.

Those who sent their “acceptance to participate” (N=248 or 17%) and email addresses were sent the link to the online survey. Three reminders were sent to those who had not returned the survey. Of the 248 students who agreed to participate 201 (81%) completed the survey. Descriptive statistics and content analysis were used to analyze the data.

**Results**

The results indicated most students had adopted a “border” identity. The majority of parents had encouraged their children to have an acceptance and pride in their biracial status. However, nearly half of respondents had little or no exposure to books, films, and TV programs related to the racial/ethnic heritage of both parents. More than one-half of respondents had little or no exposure to adult role models related to the racial/ethnic heritage of both parents. Many students indicated they would have appreciated more exposure and knowledge of their heritages, as well as preparation for negotiating their environment as a biracial person. Students offered recommendations for parental practices to strengthen their racial identity.

**Recommendations/educational importance/implications**

As one of the fastest growing student groups in this county, there is a clear need for greater attention and understanding of the biracial population. Their unique heritages must be recognized, acknowledged, and valued. Increased understanding of this population by educators and other service providers can lead to more effective supportive services for this population. Encouraging parents to engage in racial socialization of their children and to expose them to the cultural heritage of both parents is a clear recommendation from this study. The findings of this study can inform parent education programs in a variety of settings, including extension education programs, and in high school and college courses which focus on global education in general and child development and family relations in particular. Agricultural and extension educators involved in global education, both at the secondary and postsecondary levels would benefit from an increased understanding of this population. Revisions to curricula and extension in-service programming should consider concepts such as racial/ethnic heritage, exposure to stories and readings, books, and guest speakers on this topic. Creating awareness about this growing population will go a long way in understanding issues relative to racial/ethnic diversity and heritage.

**References**


Smallholder Farmers’ Perspectives on Extension Service Delivery in Post-Conflict Liberia

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Introduction
Small-scale agriculture drives the national economy and is the main source of food and livelihoods in post-conflict Liberia. Agriculture compos 76.9% of the GDP and is the primary income source of 74% of Liberians, yet food insecurity affects 80% of rural populations (Ministry of Agriculture [MoA], 2007). The Liberian government has therefore prioritized agricultural development and extension services to improve food security, rebuild rural livelihoods, and encourage peace (Arthur, 2011; Wiggins & Leturque, 2010). Improving extension includes promoting pluralism between MoA and NGO providers while also shifting towards participatory extension approaches to serve a client base dominated by smallholder subsistence farmers (MoA, 2007). However, successful transitions require gathering and incorporating the input of end users (farmers) for effective extension service delivery in the field.

Research Objectives
This study explored smallholder Liberian farmers’ perspectives on agricultural extension services. Specific research objectives were to (a) identify service providers’ information dissemination and training approaches, and to (b) describe the strengths and weaknesses of these extension approaches.

Methods
This study used an interpretivist theoretical perspective (Creswell, 2013) and basic qualitative design (Merriam, 1998). Purposive and network sampling (Ary, Jacobs, & Sorensen, 2010) were used to identify smallholder farmers (n=39) associated with MoA and NGO extension programs in three counties. Data collection utilized semi-structured interviews that were digitally recorded, conducted in English, and lasted between five and 30 minutes. Analysis used Straussian coding (Corbin & Strauss, 2007) and the constant comparative method (Merriam, 1998) to identify emergent themes. Credibility and trustworthiness was strengthened through data triangulation, member-checking, and thick description (Lincoln & Guba, 1985).

Results
Respondents indicated two main models of extension training were used in Liberia, (a) the Farmer Field School (FFS), and (b) the training-and-visit workshop. The FFS was the most advocated and utilized model in Liberian extension, but was used primarily by NGOs. This training-of-trainers approach convened a small cohort of leaders of existing farmers’ organizations, often on the farms of participants, and taught farmers using hands-on and demonstration-based methods. Field schools included regular follow-up and provided supplemental training based on farmers’ requests. Participants then disseminated training to peers in their farmers’ groups. Alternatively, the MoA and some NGOs provided occasional one-time workshops, either in communities or at central locations.

Findings showed group-based teaching methods that included demonstrations, hands-on learning, and follow-up were appropriate and effective for Liberian smallholder farmers. Respondents repeatedly stated “farmers learn by seeing and doing”. Programs that included frequent follow-up were also viewed positively, while farmers did not benefit much from one-time interventions.

The Farmer Field School approach was very successful in the majority of Liberia. Cultural factors and existing agricultural cooperatives (called “kuus”) enabled FFS graduates to conduct peer-to-peer training and act as “informal extensionists” in their communities. Most respondents described satisfaction and success teaching neighboring farmers. However, cultural differences in the Liberian southeast reduced information sharing between farmers in this region.

Finally, farmers overwhelming preferred NGO extension services to those provided by the MoA. NGO programming was more participatory and responsive to farmers’ needs while MoA programs remained top-down with centrally-determined objectives. Respondents also cited greater officer capacity, increased informational and material support, and frequent follow-up as strengths of NGOs.

**Recommendations/Implications**

Effective agricultural extension programs must fit the learning styles and meet the needs of participating smallholders (Seevers, Graham, & Conklin, 2007). Implementing evaluation mechanisms that solicit client input is therefore recommended, especially within extension systems seeking to become more participatory. Including farmer input in planning can improve the relevance and desirability of participation in extension programs, which is often challenging in developing and/or post-conflict countries where trust between institutions and the public is low or being rebuilt (Swanson & Rajalahti, 2010). Farmer feedback during implementation can allow modifications that enhance impact, provide validation to methods that work, and minimize resources expended on methods that fail (Rossi, Lipsey, & Freeman, 2004).

Successful participatory extension requires adequate funding to be successful. Evaluation requires resources, and costs of the Farmer Field School approach are higher than training-and-visit interventions (Davis et al., 2010). Most importantly, funding must support the elements most appreciated by farmers. Preparing extension officers with participatory teaching skills, facilitating responsiveness to farmers’ needs, and reducing farmer-to-officer ratios to allow appropriate follow-up all require additional monies. For example, funding was the primary reason why NGO extension programs in Liberia showed greater service quality and were better received (Moore, 2012). Therefore, governments committing to participatory extension must allot and maintain adequate funding to support these elements.

**References**


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Keywords: Social network analysis (SNA), Normative messages, Behavior change, Extension strategies, Innovative methods

Introduction/Need for Innovation
Behavior is strongly affected by social norms, or what people perceive as being acceptable among their peers (Ajzen, 1991). Research has illuminated the strong relationship between social norms and sustainable practices (Clayton, 2007), such as intention to install rain gardens to protect lakes (Shaw, Radler, Chenoweth, Heiberger, & Dearlove, 2011), and preference for environmental landscapes (Nassauer, Wang, & Dayrell, 2009). Sustainable behaviors, such as conserving water, are often invisible, and this may skew a community’s perceived social norm. As such, deeper understanding of normative messages can strategically guide Extension education. While strong relationships exist between sustainable practices and social norms, the origin of normative messages has not been explored in depth.

Purpose/Objectives
The purpose of this abstract was to explore a potential method for understanding social norms, a factor that influences behavior change as applicable to agricultural/Extension education. The specific objectives were:
1. Describe a methodology for mapping primary sources of normative messages that affect Extension clientele's practices; and
2. Encourage international Extension and agricultural educators to consider this approach to behavior change.

Results/How the Innovation Works
Social Network Analysis (SNA) is an innovative approach Extension can use to study social networks. Networks are “a set of nodes and the set of ties representing some relationship, or lack of relationship, between the nodes” (Brass, Galaskiewicz, Greve, & Tsai, 2004, p. 795). Originally a graphical network description, SNA evolved to a methodology with explanatory and statistical powers used to analyze social relations (Butts, 2008; Gould, 2003; Vera & Schupp,
2006). While SNA has been excessively utilized by disciplines such as business, sociology, and public health, agricultural and Extension education have not fully explored its application (Springer & De Steiguer, 2011).

Nodes/actors are SNA’s units of analysis and may represent individuals, groups/communities, organizations, or countries (Zack, 2000). Ties/relationships define the connection or flow of material/non-material resources between the nodes/actors (Wasserman & Faust, 1994) and “resources might include social support, emotional support, companionship, time, information, expertise, money, business transactions, shared activity” (Williams, 2005, p. 22). Ties between two nodes/actors can be informal and based on trust or bound by formal contract (Provan, Fish, & Sydow, 2007).

SNA involves of six steps: 1) Define the network and its actors, often through needs assessment; 2) Develop questionnaire; 3) Collect data to identify actors and ties; 4) Input data to software such as UCINET 6 (Borgatti, Everett, & Freeman, 2002) to produce the matrix of actors and ties between actors; 5) Draw the whole network map of stakeholders (in our case Extension clients) through Netdraw (Borgatti, 2002); and 6) Conduct further analysis through UCINET 6 to identify primary sources of normative messages and define which have the greatest effect on decision-making.

Research has identified the important role community social networks play in understanding stakeholders’ natural resource management behaviors and decision-making (Bodin & Crona, 2009; Lauber, Decker & Knuth, 2008; Rickenbach, 2009), such as collaborative initiatives for watershed protection and natural resource management (Springer & De Steiguer, 2011). Researchers have concluded that SNA has much to offer the Extension profession. Benefits include a deep understanding of stakeholders’ characteristics such as learning, leadership and trust in natural resource management (Bodin, Crona, & Ernstson, 2006), unique visual and statistical elements (Springer & De Steiguer, 2011), identifying new community relationships formed based on common interests, and an efficient way to evaluate the effectiveness of collaborative planning (Mandarano, 2009).

**Conclusions**

SNA is a valuable and underutilized methodology that can identify primary sources of normative messages and information through its unique network maps. To encourage beneficial behavior change, Extension professionals may emphasize the perceived norm and correct false perceptions about community behaviors (Kotler & Lee, 2008) using the source of normative messages identified through SNA. Additionally, SNA has great potential to identify and explain the impact of Extension outreach (Bartholomay, Chazdon, Marczak & Walker, 2011; Kumar Chaudhary, 2014). Overall, it was concluded that exploring community members’ social networks through SNA provides an opportunity to understand the social norms that guide natural resource management behaviors.

**Recommendations/Implications**

SNA has the potential to explain the source of normative messages, and it is recommended that Extension professionals consider using this methodology as a means of understanding and encouraging positive behavior change. SNA findings can be used to guide targeted Extension programming. By understanding who or what makes up key sources of normative messages, practitioners can maximize their influence on sustainable behaviors. A professional development on use of SNA should be organized for practitioners from countries who have no access to technologies like SNA.
References


Testing the Bidirectional Relationship between Interests and Self-Efficacy Among New Zealand Secondary Vocational Education Students

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Keywords: Career Development, Social Cognitive Career Theory, High School Students, Vocational Education, New Zealand

Introduction & Theoretical Framework

Education in New Zealand is a primary mechanism for the development of skills within the population (Ministry of Education, 2004); however, planned programs such as career education have only recently been brought to the forefront in New Zealand (Smith, n.d.). Prideaux and Creed (2002) noted that, “career development has become a burgeoning field of study in New Zealand that has attracted research attention from a wide range of perspectives” (p. 22). However, there is not a great deal of local research around career development in general, let alone at the adolescence stage (Smith, n.d.).

Bandura (1986) developed the concept of self-efficacy as part of his Social Cognitive Theory, which is the foundation of Lent, Brown and Hackett’s (1994) Social Cognitive Career Theory (SCCT). SCCT suggests that cognitive variables interact with people, contexts, learning experiences, and thus lead to academic and career outcomes (Lent, Brown, & Hackett). In the SCCT model, an emphasis is placed on the appraisal function of socio-cognitive variables including self-efficacy, outcome expectations, and interests and further proposes how these variables could interplay with person input factors and contextual affordance to impact various career development outcomes.

Purpose and Hypotheses

The purpose of this study was to extend the scope of Social Cognitive Career Theory in an international context by testing the bidirectional relationship between self-efficacy and interests and testing two mediation effects among a sample of New Zealand high school students. For this study, we hypothesized that:

1. Agricultural outcome expectations would mediate the relationship between self-efficacy and career interest while controlling for race, gender and grade.
2. Agricultural interests would mediate the relationship between agricultural outcome expectations and agricultural self-efficacy, while controlling for race, gender and grade.

Methods and Procedures
Participants were students ($n=164$) taking agriculture courses at four secondary schools in New Zealand. A majority of the students were male (91%). Participants ranged in age from 13 to 17 ($M = 15.0$, $SD = 1.10$). Participants represented four of the five grade levels within the New Zealand secondary school system: Year 9 (35%); Year 10 (35%); Year 11 (20%); and Year 12 (10%). In terms of race/ethnicity, a majority of the students were Pakeha (72%) followed by European (12%), other (10%), Maori (5%), and Asian (1%). Data were collected using the Agriscience Education Self-Efficacy Scale (Authors, 2004). The instrument is composed of four sections measuring variables of the SCCT framework: Agricultural Self-Efficacy, Agricultural Outcome Expectations, Agricultural Intentions/Goals, and Agricultural Interests. Internal consistency reliabilities for the four scales were: .85, .86, .93, and .90, respectively.

This study examined three variables of the SCCT framework: agricultural self-efficacy, agricultural outcome expectations, and agricultural interests. To investigate the reciprocal relationship between self-efficacy and interests, we used the three-step mediation test strategy proposed by Baron and Kenny (1986) to conduct a series of hierarchical regression and test two mediation effects implied from the reciprocal relationship between self-efficacy and interests proposed by Armstrong and Vogel (2010). Although most studies test the SCCT model using Structural Equation Model (SEM), scholars have noted the weakness of SEM, including sensitivity of the chi-square statistic when the sample size is large, as well as difficulties in choosing the best model while the fit indices are similar (Weston & Gore, 2006).

Findings

Our study confirmed Lent et al.’s (1994) SCCT model indicating a direct relationship from self-efficacy to interests, and outcome expectations mediated the relationship between self-efficacy and interests. Our study also indicated a direct contribution of interests to self-efficacy and interests partially mediated the relationship between outcome expectations and self-efficacy. Overall, the findings indicated a reciprocal relationship between self-efficacy and interests.

Conclusions

Our two hypotheses were supported by the findings that agricultural outcome Expectations partially mediated the relationship between agricultural self-efficacy and agricultural Interests. Also, agricultural Interests partially mediated the relationship between agricultural interests and agricultural outcome expectations. This study confirmed the original model of Lent, Brown and Hackett (1994) that there is direct relationship from self-efficacy to interests, and mediation effects of outcome expectations on the relationship from self-efficacy to interests. Moreover, our findings also indicated a partial mediation effect of interests as a mediator between outcome expectations and self-efficacy.

Implications

The findings of this study have practical value for career development practices in New Zealand Secondary schools. Specifically, career education practitioners may want to pay more attention to the role of interests on the career development of students enrolled in New Zealand secondary vocational education programs as they consider postsecondary education and career opportunities within the agricultural sciences.

References


The Importance of Water: A Look at Student Perceptions of the Arkansas Water Resources Center, Water Resources, and Water Issues

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Introduction
Water has been undoubtedly described as our most important resource, yet it has been constantly threatened by human activities (Vörösmarty et al., 2010). Demand for freshwater has only increased with industry needs, agricultural needs, and rapid growth of the human population (Hanjra & Qureshi, 2010; Oladele, 2012; Ridoutt & Pfister, 2010). Thus, to improve the sustainability of water use there is a need for consumers to be educated about water including usage, threats, and strategies to make water consumption sustainable (Hanjra & Qureshi, 2010; Ridoutt & Pfister, 2010). Water resources research institutions such as the Arkansas Water Resources Center (AWRC) were established in the United States when Congress passed the Water Resources Research Act in 1964. There is a network of 54 water institutes throughout the 50 states at land-grant universities, as well as at the District of Columbia, Puerto Rico, Guam, and Virgin Islands. The AWRC and other water institutes work with the U.S. Geological Survey and National Institute for Water Resources to help local, state, and federal agencies learn to manage the nations’ water resources. Part of the AWRC’s mission is to support research to address water issues and enhance the understanding of those issues as well as to disseminate the results of research to industry stakeholders and the public. Organizations like the AWRC should identify and target specific audience segments of a population rather than trying to reach broad audience groups (Guth & Marsh, 2006; Marshall & Johnston, 2010; Rice & Atkin, 2013). Therefore, research that establishes and affirms effective communication practices is valuable to improve industry understanding about how to identify audiences, how to target audiences, how to determine opportunities for learning, and how to identify potential challenges (Guth & Marsh, 2006).

Purpose and Objectives
The purpose of this study was to quantitatively assess current University of Arkansas students’ perceptions of the AWRC in an effort to define communication campaign goals. The following research objectives were developed to guide this study:
Determine current university students’ perceptions of water resources and issues.
Determine current university students’ level of interest in water resources and issues.
Determine current university students’ perceptions of the AWRC.
Determine current university students’ level of interest in receiving AWRC information.
Determine the relationships between university students’ interest, awareness, and concern of water issues.
Determine the relationship between students’ class experiences; interest in learning more about the AWRC; and interest, awareness, and concern of water issues.

Methods
This research was a descriptive-correlational study utilizing survey methodology. The population of the study was \((N = 24,537)\) current students enrolled at the University of Arkansas. A sample size of 378 was determined using a survey calculator with a confidence level of 95% and a margin of error of 5% (SurveySystem, n.d.). A 26 question survey was developed from an existing instrument, reviewed by a panel of experts, pilot tested, and revised. Likert-type questions were based on a five point scale with 1=very low and 5=very high. Descriptive statistics were used to gather means, standard deviations, frequencies, and percentages. Correlation statistics were used to determine relationships and the strength of those relationships.

Results
The researchers found participants were most aware \((M = 3.23, SD = 1.14)\), concerned \((M = 4.07, SD = 0.86)\), and interested \((M = 4.10, SD = 0.87)\) in drinking water quality. Students who participated were least aware of the AWRC \((M = 2.23, SD = 1.10)\) with 67.6% of students reporting a low or very low level of awareness. The data showed that positive correlations between students’ overall interest, awareness, and concern of water. Interest and awareness had a strong positive correlation, \(r = .61, p < .0001\). Also, interest and concern had a strong positive correlation, \(r = .75, p < .0001\). There was a moderate positive correlation between awareness and concern, \(r = .50, p < .0001\). Additionally, there were direct positive correlations between students’ class experiences, their interest in learning more about the AWRC and their overall interest, awareness, and concern of water.

Conclusions and Recommendations
Overall, the means of the awareness questions indicate many students had low levels of awareness or were uncertain about their awareness level. Students, on average, reported their concern and interest in water between uncertain and high. While students may be uncertain about their awareness, they have some level of concern and interest for water. Which is consistent on a global scale because people are becoming more interested in policies regarding natural resources (Cox, 2013; Singletary & Daniels, 2004). Because university students have some level of interest, an educational communication campaign has the opportunity to be successful in increasing awareness.

The researchers recommend the AWRC use the demographics reported to target specific audiences groups with educational messages about drinking water quality, the AWRC’s activities, and water research. The results indicate a need for more water centers and natural resource organizations to identify perceptions among audience groups to determine effective messaging routes.
References


The Influence of Agricultural Content in Primary School Curriculum on a Rural Ugandan Village

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Introduction

Leadership and technical knowledge development in students of agricultural education programs in the United States has long been a desired goal (Brannon, Holley, & Key, 1989). However, the same characteristics learned via school-based agricultural education may be utilized for family survival in third world countries such as Uganda (Kibwika & Semana, 2001). In Uganda, District Agricultural Training and Information Centres (DATICS) have been established to provide training to students aged 15-25 who have dropped out of school. DATICS’s purpose is to offer education regarding improved agricultural education and to move the agricultural sector away from subsistence farming to market orientation (Mugisha and Owens, 2008). However, children who are still in school are not addressed in this initiative. Further, a close examination of the nationally mandated science curriculum revealed that there are substantial amounts of agricultural education embedded in the course work. Also, due to many factors, many rural Ugandan children remain in primary schools even though they are well into their teen years and a large group of those never enter secondary school. This study was designed to investigate the relationship(s), if any, that may exist between primary student education in agricultural practices and implementation in the home farm in a rural Ugandan village.

Purpose

The purpose of this study was to better understand the lived experience of stakeholders who may have been impacted by the science/agriculture curriculum. Specifically, this study sought to investigate how the content being taught in the primary school was or was not diffusing through this small African village.

Research Questions

1.) What were the teachers’ experiences and perceptions concerning the embedded agriculture content?  
2.) What were students’ experiences and perceptions concerning the agricultural curriculum taught in science class?
To what extent did students act as the communication channels from school to their parents?

Methods

This qualitative study utilized phenomenological methodology (Balschweid & Huerta, 2008; Crotty, 2003). This allowed the researcher to make sense of lived experiences in the lives of individuals interviewed. Data were collected via direct observation, semi-structured one-on-one interviews, and focus group interviews. Hatch (2002) stated that semi-structured interviews are useful to gather data from a conversational manner. Glesne (2011) stated that small focus groups of three or four are key for children to answer questions honestly and freely.

For grades five through seven, each class monitor (n = 4) was interviewed. Additionally, parents of each child were interviewed (n = 3). Finally, teachers (n = 4) and community leaders (n = 4) were interviewed. Once data were collected, the researcher utilized thematic analysis to identify emerging themes from respondents’ interviews (Dooley, 2007; Glesne, 2011).

Results

There were four themes that emerged. The first theme was contextualized teaching. Teachers of science and English integrated agricultural content in their lessons. The Head Master Teacher perceived that the agricultural content was not an improvement upon existing agricultural practice in the village, however, the younger teachers believed the content was improved. The second theme was improved agricultural practice. Each teacher, parent, and farmer interviewed grasped the concept of improvement upon their current agricultural practices. While the Head Master Teacher did not perceive the taught agricultural content to be an improvement upon existing practices, the other teachers interviewed did perceive improvement. Parents and farmers were eager for an opportunity to be educated about improved agricultural practices. The third theme was that of barriers to students as communication channels. Barriers such as time management and household chores like fetching water each evening were perceived by parents and teachers to inhibit the diffusion of agricultural content taught at the school. The fourth theme was prompted adoption. Respondents reported that advancements in agricultural practice had occurred in the village as a result of “foreigners” and “white leaders”.

Recommendations

Practitioners may benefit from incorporating a relationship with foreign individuals in order to foster motivation for children to share content learned with their parents regarding agricultural practices. Teachers of agricultural content in the village may consider utilizing a model like that of Supervised Agricultural Experiences, in the United States. Teachers may benefit from professional development that addresses the value of taught agricultural content to improving existing agricultural practices. This may provide a common goal for all teachers to seek to improve agricultural production for the next generation. Further research is needed to determine the feasibility of adult education administered by science teachers employed by the school.

References

Three Case Studies: School-based Agriculture Education in Korea, and Implications for U.S. Agricultural Education

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Introduction

School-based agricultural education in the U. S. provides systematic instruction in agriculture for entry into an agricultural occupation and/or creating an informed citizenry (Phipps, Osborne, Dyer, & Ball, 2008). The definition, scope, and audience for career and technical education (CTE) programs have fluctuated over the years, typically in response to international and national needs and issues (Wang, 2011). The image of CTE and agricultural education ebbs and flows, from being a dumping ground for low ability students to a college/career ready program (Gordon, 2008).

Agriculture education programs in U.S. secondary schools and the Republic of Korea (referred to as Korea) share many similarities but also involve different modes of instructional programs. Information regarding three scenarios of agricultural education in Korea are presented, with implications for the U.S. Findings are based upon tours of three schools, materials shared by headmasters, and school websites.

Purpose and Objectives

The purpose of this qualitative study was to discover how school-based agriculture education (SBAE) in Korea is offered. The objective was to describe three different models of SBAE and offer suggestions for possible adoption in the U.S. system.

Methods

Data collection occurred during a four-week intensive study abroad program in Korea. Participants included 16 agriculture education teachers and teacher candidates and faculty from two agriculture teacher education programs. At each of the schools, presentations about the school curriculum and programs were conducted by headmasters, teachers, and students. Tours of the schools were conducted by teachers and students. Observations of students involved in
hands-on experiences were made at each site. The information from the presentations, school websites, personal communications, and tours was captured in the case studies.

**Results**

Three high schools in Korea were included in the study. The schools represented the three different models used in Korea to offer agricultural education: general high schools, vocational and technical schools, and Meister schools (Na, 2011).

Case 1: Suwon High School for Agriculture Sciences is a comprehensive or general high school that offers agriculture education in six career areas. Students enroll in intensive agriculture education programs but also take general education courses. Although the Korean system indicates that these students are not necessarily college-bound, the students also participate in after-school college readiness programs (tutoring) like students in the academic high schools, which is prevalent in Korea.

Case 2: Yeo-ju Self-Management Agricultural High School is an agriculture high school emphasizing hands-on skill development, co-located with the Yeo-ju Agriculture Technical School. Students are involved in managing the expansive school farm that includes a dairy operation, swine and poultry production, small animal care, and crop production to support the livestock and dairy units. Students are involved for a large portion of the school day in production agriculture enterprises. The school is “self-managed,” meaning the animal and crop units are managed by students and instructors and provide financial support for the operation of the school. Graduates may remain for two additional years in the technical school or enter an agriculture occupation.

Case 3: Meister schools are patterned after the German system of vocational education. At the Horse Husbandry and Horsemanship High School, students study only topics related to horsemanship, including riding. They have a career goal of becoming horse trainers, horse farm managers, and/or professional riders (jockeys). The residential school serves the entire country; tuition of $12,000 per year is fully paid by industry; students pay only for their housing and meals. The Tea Production and Processing High School operates similarly, only in the tea industry. Again the school is heavily supported financially by industry.

**Recommendations and Implications**

Unlike the U.S. system, Korean agricultural education is offered in schools with different overall goals. Some students prepare for college rather than immediate entry into the workforce, while others are immersed in skill production, and still others are in narrowly-focused schools with strong industry involvement. With graduation requirements in the U.S. becoming more stringent and with the continued evolution of high-stakes testing, U.S. students have few choices in terms of CTE program options.

The Korean education system has developed economic partnerships with industries that support specific job training programs. While there is some industry support of SBAE in the U.S., industry does not partner with CTE programs to the same extent.

Agriculture education in the U.S. cannot make programmatic changes unilaterally. However, the concept of greater industry involvement and financial support should be encouraged. Although perhaps controversial, some CTE programs, including SBAE, could be considered only as career preparation programs rather than including both career preparation and college readiness in one program.
References
Training Army Officers to Be Extension Officers: Educational Needs of the Sudanese Peoples Liberation Army’s Agricultural Battalion

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Introduction

The United States Department of State created numerous programs to improve food security in South Sudan for the Sudan People’s Liberation Army (SPLA). One such program was Extended Agricultural Training (EAT). The EAT concept is intended to train members of an agricultural battalion to serve as extension officers for disseminating improved agricultural practices to local farmers and managing the SPLA’s farms to enhance food production in South Sudan. Deficient training of extension personnel in developing countries negatively impacts sustainable food security (Ghimire & Martin, 2011).

The success of extension professionals in developing regions is due to their technical competencies and training (Kanté, Edwards, & Blackwell, 2013). Extension can develop training programs to address core competencies needed by professionals to meet organizational goals (Harder, Ganpat, Moore, Strong, & Lindner, 2013). To improve the lives of target audiences, extension personnel need continuous training to enhance existing competencies (Erbaugh, Kibwika, & Donnermeyer, 2007).

Purpose and Objectives

This study was conducted to develop an understanding of the training needs of the SPLA’s agricultural battalion officers in the EAT program. More specifically, the study sought to:

1. Describe participant reflections on their proficiency of training competencies; and
2. Describe participant reflections on their perceived needs to enhance capacity as a future extension officer.

Methodology

A qualitative research design was conducted for the study. The researchers purposively sampled the sixteen ($N = 16$) participants in the EAT program. The program objectives were to prepare SPLA officers to become extension officers in communities, and educate farmers in growing food to improve food security in the post-conflict South Sudan. The participants were purposively sampled from the population enrolled in the EAT program due to the objectives of the program and the objectives of this study (Lincoln & Guba, 1985).
Semi-structured questions were used to conduct all sixteen \((N = 16)\) participant interviews. Data was collected through audio recordings and researcher notes. Data was translated and transcribed to produce data chunks, which were then coded into thematic categories. The data was inductively analyzed using Glaser’s (2007) constant comparative method for identifying themes.

**Results and Conclusions**

Due to space limitations of the abstract, the emerging themes of the qualitative data is presented here. The conference presentation would expand the findings from participant’s testimonials regarding the research objectives of the study. The two over-arching themes were perceived competencies wanted and materials needed to be successful extension professionals.

The majority of participants \((n = 15)\) indicated they need more training related to teaching adults. Fourteen \((n = 14)\) participants wanted to better understand evaluation techniques to measure the impact of their teaching. Twelve \((n = 12)\) participants wanted to be more knowledgeable in identifying pests and plant diseases. Eleven \((n = 11)\) participants believed they needed more farm management content to help farmers be successful. Ten \((n = 10)\) participants felt more training into small animal production is needed prior to their role as an extension officer.

Participants identified materials they believed would improve their capacity as a future extension officer. Thirteen \((n = 14)\) of the participants believed they would need internet access to locate and obtain supplemental training materials. Twelve \((n = 12)\) of the participants wanted their own library to reinforce training competencies acquired during their EAT experience. Eleven \((n = 11)\) participants wanted materials to teach soil testing procedures and curriculum to teach farmers pests and disease identification. Ten \((n = 10)\) participants wanted visual curricula due to their target audience being illiterate. Seven \((n = 7)\) participants wanted dictionaries to better understand English to work more effectively with U.S. and European agricultural development organizations.

**Recommendations/Implications/Educational Importance/Impact on the Profession**

The lack of a formal Extension System underscores the need for consistent training for individuals serving as extension officers in post-conflict and developing nations. The data suggested training needs of army officers working to serve as future extension officers. The most indicated training competencies needed further training where developing and evaluating programs for adults (Harder et al., 2013). Perpetual training in teaching, learning, evaluation, and disseminating information to farmers (Ghimire & Martin, 2011) is needed to enhance future extension officers teaching and information dissemination skills. Training is needed in subject matter content related to pest and disease control, farm management techniques, and small animal production to assist South Sudan combat food insecurity (Erbaugh et al., 2007; Kanté et al., 2013). South Sudan and other post-conflict nations need international organizations who can provide training to create competent and excellent extension education programs.

**References**


Understanding International Travelers’ Perceptions Regarding the Need to Declare Agriculture Products

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Introduction
It has been projected the cost for invasive species management is equivalent to 5% of the global economy (Pimentel, Zuniga, & Morrison, 2005). The Invasive Species Advisory Committee (2006) defined invasive species as an alien species whose entry causes financial or ecological harm or harm to people’s health and Pimentel et al. (2005) found invasive species cause damages in the U.S. that are estimated to be around $120 billion per year. Controlling for invasive species is a daily challenge around the world with travelers unintentionally bringing them across borders in the form of agricultural products. This may be due to a lack of knowledge that the item hosts an invasive species, but cultural differences may also play a role with some products culturally acceptable in one location and not another (Schwartz, 1999). Therefore, there is a need for international extension educators to create programs to educate the public from diverse backgrounds on the importance of declaring agricultural items when traveling internationally (Lamm, Harder, Irani, Roberts, & Snyder, 2011).

Purpose and Objectives
The purpose of this study was to understand international travelers’ perceptions regarding the need to declare agriculture products and how their demographic characteristics influence these perceptions. The objectives were to (a) describe respondents’ perceptions regarding the need to declare agricultural items, and (b) examine how demographic characteristics influence these perceptions.

Methods and Data Sources
A total of 509 respondents were obtained using non-probability sampling from Florida residents, age 18 or older, which have traveled to the Caribbean in the past three years or planned to travel to the Caribbean in the next three years. Quota sampling was applied to ensure the sample represented the population of interest (Baker, et al., 2013). The survey was researcher-developed, underwent expert panel review and was pilot tested. Respondents were asked to indicate their level of agreement with three questions pertaining to traveling with agricultural products on a five-point Likert-type scale (1 = Strongly Disagree, 5 = Strongly Agree). They were
also asked a series of demographic items. Descriptive statistics, t-test, and ANOVA were used in the data analysis process.

Results

Respondents were 47.5% male, 52.5% female and 13.6% identified with a Hispanic ethnicity. The majority were White (82.5%), followed by African American (11.0%), Asian or Pacific Islander (3.5%), Native American or Alaska Native (2.8%), and Other (2.4%).

The majority of respondents agreed or strongly agreed with the statements, “When an item is subject to inspection, I have to declare it when going through customs” (89.0%), “I think that I should declare agricultural items as they may contain harmful pest and diseases” (88.6%), and “When an item is prohibited from entering the U.S. in passenger baggage, I have to declare it when going through customs” (87.7%).

An independent t-test was used to determine if Hispanic ethnicity influenced perceptions regarding the need to declare agricultural items revealing a significant difference between Hispanics/non-Hispanics ($t = -2.43, p = .02$). A one-way ANOVA was then used to determine mean differences between racial groups resulting in significant differences between groups ($F = 3.21, p = .01$). Post hoc tests were conducted revealing American Indians significantly differ from the other racial/ethnic groups. Lastly, a one-way ANOVA test was conducted to determine if age influenced perceptions revealing significant differences in perceptions based on age ($F = 8.00, p < .01$). After conducting post-hoc tests it was determined that respondents who were in the 20-29 age group differed significantly from the 30-39, 40-49, and 50-59 age groups.

Conclusions and Recommendations

Overall respondents agreed it was important to declare an item if it is subject to inspection and that when agricultural items may contain harmful pest and diseases it is best to declare. In addition, demographic characteristics (with the exception of gender) does influence perceptions associated with declaration as expected. International extension educators should use this information to develop educational experiences that appeal to travelers of diverse backgrounds. For example, bilingual educational materials (i.e. YouTube videos, blogs, and factsheets) targeting Hispanic audiences could directly change perceptions associated with the need to declare agriculture products, minimizing the impacts of invasive species. Future research examining the impact of bilingual materials on perceptions would assist in understanding how targeted materials are working.

References


University of Arkansas Agriculture Students International Experiences: Preferences, Influences, and Barriers

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Introduction

International experiences (IEs) offer students many improvement opportunities, including increased awareness of the interdependence of nations, value of diversity, and development of global perspectives (Kitsantas & Meyers, 2001). Previous research noted that students consider two goals when making their decision—budget and career impacts (Salisbury, Umbach, Paulsen, & Pascarella, 2009). Students also classify attributes of IEs as either motivators (i.e. “fun, different culture, personal development”) or as deterrents, which deal with relationships and commitment, country concerns, and economic concerns (Payan, Svensson, & Hogevold, 2012, p. 76). Students are also influenced by their families when making decisions about IEs, and this factor is more poignant for undergraduate students (Mazzarol & Soutar, 2002).

Social cognitive theory, which explains learning based on interactions between people, is one way of understanding student decision making about IEs (Bandura, 1986). Bandura (1986) asserted that for people to learn they must possess prior capabilities, and two of these are particularly important for deciding to study abroad—symbolizing capacity and forethought capacity. Symbolizing allows students to integrate and assign meaning to an IE, and forethought allows students to weigh the consequences of an IE before engaging (Bandura, 1986; Conner, 2013).

It is increasingly important for agriculture students to think internationally and understand global effects on policy and issues in agriculture (Edgar & Edgar, 2009). Research has been conducted to assess the effect of IEs on agriculture students (Zhai & Scheer, 2002), yet little research has been conducted to assess student preferences and deterrents to IEs.

Purpose/Objectives

This study assessed agriculture students at the University of Arkansas for their preferences for and what influences and hinders them from engaging in IEs. The following objectives guided this study:

1. Determine student preferences (i.e. time and duration) for various types of IEs; and
2. Describe student influencing factors and barriers for engaging in IEs.
Methods

The study population for this descriptive survey methodology consisted of a random stratified sample (Trochim, 2001) of large-enrollment undergraduate courses at the University of Arkansas in the Dale Bumpers College of Agricultural, Food and Life Sciences (Bumpers College), during the fall 2013 semester. In the 17 courses surveyed, 1,094 students were enrolled, and usable data was collected from 773 Bumpers College students, a 70.1% response rate. The survey was composed of 13 questions created by the researchers that assessed students’ IE preferences, perceived barriers and influencers to studying abroad, and demographics. Likert-type questions were based on a five point scale with 1=strongly disagree and 5=strongly agree. Face and content validity were assessed by faculty of the college’s International Programs Committee, which included a representative from each department.

Results

All student classifications were represented with approximately equal frequencies. Of the students surveyed in the college of agriculture, 66.3% were interested in IEs. Students were most interested in study abroad opportunities (52.4%), followed by internships (47.3%). The most frequently chosen option for length of stay was 4 to 6 weeks (32.2%), followed by one semester (27.5%). Regarding student semester preferences, respondents were most interested in the summer semester (49.8%), followed by the spring semester (20.3%). Students were neutral or disagreed on whether or not parents, faculty, peers, or siblings influenced their decisions to study abroad. Students listed parents as the most important influencer ($M = 3.30, SD = 1.28$), yet the means for the other options were very similar. However, each influencer had a large standard deviation, indicating large variation in responses. Students noted cost as the most-inhibiting barrier ($M = 3.92, SD = 1.16$), and fear of traveling outside of the country was the least-inhibiting ($M = 1.89, SD = 1.18$).

Conclusions and Recommendations

Findings of this study lead to three recommendations for Bumpers College. First, if the college wants to provide opportunities for students to gain international experience and insight, it must create programs that provide students with value other than what they can gain from the college curriculum (Kitsantas & Meyers, 2001). Students cannot engage in symbolizing capability through an IE if there is not an opportunity available for them to do so (Bandura, 1986). Next, agriculture students are more interested in short-term time commitment experiences and those that do not require a time sacrifice of their preconceived educational timeline, so the college should provide opportunities that match these student forethought considerations (Bandura, 1986). Last, the college should make students more aware of the financial opportunities available and seek additional funding for students for IEs, which would also improve the forethought capacity of students (Bandura, 1986). Following these recommendations will provide agriculture student with more opportunities to be internationally competent, which is noted as an important characteristic for the profession (Edgar & Edgar, 2009). Lessons learned through this study may add value to other colleges and universities struggling to provide their students with international experiences.

References


Use Of Extension Education for Identification of Farmers Innovation Processes in Kano – State, Nigeria

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Introduction
Innovation is important in agricultural development, particularly in the face of capacity building and promoting interaction. Efforts to support and encourage innovation have in the past been based on theoretical models; extension policy and practice have enshrined a linear, transfer of technology model. More recent thinking has been on agricultural innovation systems; within this thinking, emphasis is on interactions between multiple actors, which put extension education at the heart of innovation systems.

Farmers’ innovation processes can be promoted through extension education in rapidly changing agricultural conditions. Systems of interactive players and individuals are needed at the grassroots and global levels for enhancing farmers’ innovation processes. For farmers to take the lead in such collaborations, their capacities need to be strengthened and changes within organisations, institutions and their policy need to be advocated at all levels (Juma 2011). Strengthening resource-poor farmers’ innovation ability is important in establishing a link between research-led and community-led projects.

Purpose of the abstract
In an attempt to overcome the challenges faced by National Agricultural Research Systems (NARS) and Agricultural Knowledge Information System (AKIS), various innovative-based groups at national and international levels are constantly looking for alternatives to the conventional, linear process of technology transfer. This can be achieved according to Spielman, Ekboir et al. (2009) by emphasising the need for interactive developmental approach out of the increasing economic growth and demographic pressures, in addition to constant entry of new market forces and actors. The key to success in agricultural research and development among individuals and organisations are centred on better understanding of the current farmers’
innovation processes, in addition to provision of useful extension education in identifying the ways of catalysing the processes and how they can be supported. Davis and Asenso-Okyere (2010) observed urgent need for extension services to devise the best ways of supporting almost 1 billion small-scale farmers in relation to information sourcing, empowerment, capacity building and technology transfer. In another development, Asenso-Okyere and Mekonnen (2012) emphasise about 75% of the rural people in Africa earn their livelihoods through agriculture, and they still face food insecurity and poverty.

**Objectives**

This paper examines usefulness of extension education in promoting farmer’s (informal) innovation processes that have occurred over the years (five to six) in Kano - State, Nigeria. In addition to this, the paper considers the following objectives;

- Identification of variation in innovations between localities and innovation actors.
- Determine sources of innovation ideas and key events in innovation histories.
- Assess linkages between farmers and other innovation actors.

**Data sources and Participants involved**

In addition to a workshop conducted with 48 participants; 30 farmers, 6 Extension agents, 3 Agro-dealers, 4 staff of IITA and ICRI SAT and 5 staff from Bayero University, Kano for actor and innovation identifications using Rapid Appraisal for Agricultural Knowledge Systems (RAAKS) window A2, semi-structured interviews were used to collect data from other farmers (N= 80) and two rural enterprises (N=40) from two out of the three Agricultural Development Projects (ADPs) Zones of the State.

**Data Analysis**

Extension agents in the workshop educated the farmers using RAAKS for assessing the variation in innovations between the localities, actor and innovation identification, in addition to sources of innovation ideas. Innovation timeline was used in assessing the key events in innovation histories, with particular interest to representative innovation.

**Results**

The results indicate there are informal innovations in addition to formal innovations introduced to farmers; they are capable of developing innovations to satisfy their ecological and economic needs. There are variations in the use and adaptation of the innovations (formal and informal) across the localities, which show diversification of agricultural innovations and farming practices. Farmers identified the following informal, technological innovations; mixed cropping, use of pepper and ash in storing cowpea, wider spacing and planting soybean to control striga in cowpea and maize fields. While the following formal innovations were identified; Use of improved seeds, Strip cropping, Spacing, Improved storage and fertiliser application. The ability of the farmers to modify the formal innovations was impressive and would promote farmers involvement in various innovation development. Agricultural innovation also entails new forms of organisation and new forms of interaction, which fits into changing extension agents’ and farmers’ ways of interaction, access and use of information. Links between actors varied among the participants, with each group of actors perceived their links in relation to information exchange. Farmers’ perception on their links with extension agents in relation to information exchange was at least as strong as those among themselves. The strong links of
farmers as perceived by other actors in relation to information exchange clearly indicates how central farmers are in various agricultural and rural development programmes. Sources of innovation ideas as one of the objectives, State ADP, IITA and SSG2000 were considered the major sources of formal innovations while fellow farmers, lead farmers, grandparents, self-initiation and trial and error, were considered as the major informal innovation sources. Although the research institutes were the sources of formal innovations, extension agents through ADPs are the major links to farmers.

**Conclusion and recommendations**

Promoting farmers’ (grass root) innovation processes is helpful in enabling farmers to meet their environmental and economic needs. In general, extension education was enhanced through facilitating farmers’ innovation processes ranging from introducing, promoting and adapting formal and informal innovations to changing strategies for extension education. Future international extension approaches that focus on agricultural development in Africa should emphasise on educating farmers’ for better understanding of their innovation processes, particularly on the modification of formal innovations to suit their farming situations.

**Reference**


Using Public Opinions of Invasive Species to Drive the Development of International Extension Education Programs

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Keywords: Invasive species, Ecological management, Public opinion, Extension education

Introduction

Issues associated with invasive species have been catching the public’s attention globally due to media coverage (Mooney & Hobbs, 2000). As defined by Colautti and MacIsaac (2004), invasive species are organisms that break natural biogeographical boundaries and influence the ecology at the location of invasion. Issues with invasive species have been reported internationally, but in the United States alone more than 6,500 non-native species have caused adverse impacts to the native species, ecosystems, and human and wildlife health (United States Geological Survey, 2013). Additionally, invasive species can negatively impact a country’s economy by reducing natural resource based businesses and requiring funding for eradication and restoration of habitat efforts (Harmon, Vergot, Momol, Xin, & Miller, 2009; Pimentel, Zuniga, & Morrison, 2005; United States Fish and Wildlife Service, 2012). However, low public awareness of the impacts of invasive species have been reported in various countries around the world and a need for invasive species education has been suggested (Bremner, & Park, 2007; Yan, Zhenyu, Gregg, & Dianmo, 2001). As a result, international extension educators need to understand the public’s knowledge levels and willingness to learn about invasive species to design educational programs that can enhance public engagement in invasive species management.

Purpose and Objectives

The purpose of this study was to understand current levels of public knowledge and perceptions of invasive species and interest in specific educational programs related to invasive species. The objectives were to identify (a) Respondents’ knowledge levels of invasive species; (b) Perceptions of invasive species management; and (c) Respondents’ willingness to learn about invasive species.

Methods and Data Sources

An online survey was used to assess public opinions of invasive species. Florida residents were chosen as the population of interest because the ecosystem, number of international travelers, and exotic pet industry have left Florida exposed to a high risk of species invasion. The survey instrument was researcher-developed, reviewed by a panel of experts and pilot-tested. Respondents were asked to indicate their perceived level of knowledge about invasive species using three statements on a five-point Likert-type scale (index score reliability calculated to be α
Respondents were also asked to indicate their perceptions of prioritization efforts and management practices for invasive species by selecting all that apply in six listed factors, and importance of management practices for invasive species using a five-point Likert–type scale. The responses were averaged to generate an index score found to be reliable (α = .90). The respondents then indicated their interest in learning more about invasive species and their preferred mode of learning.

A non-probability sample was obtained using opt-in method with 546 entering the survey resulting in a 94% response rate (N = 515). Data was weighted using post-stratification weighting methods to overcome limitations caused by potential exclusion, selection, and non-participation biases (Baker, et al., 2013; Kalton & Flores-Cervantes, 2003). Descriptive statistics were used.

Results

The majority of respondents indicated they were not knowledgeable or slightly knowledgeable about (a) invasive species in general, (b) types of invasive species in Florida, and (c) prevention strategies related to invasive species. When asked about factors that should be prioritized to control invasive species, “harm to native species” was reported most frequently (87%), followed by “harm to humans” (83%). Half of the respondents (n = 255) believed invasive species should be controlled using management strategies only in areas that are most affected and almost 80% of the respondents believed preventing invasive species from entering Florida in the future was highly or extremely important. In addition, more than half of the respondents were interested in learning about the types of invasive species (64%) and strategies for managing invasive species (51%). The preferred learning channels reported by the most respondents were television (76%), websites (75%), and video (74%).

Conclusions and Recommendations

The findings indicated respondents had low knowledge levels of invasive species, which is consistent with the findings of Bremner and Park (2007) and Yan et al. (2001) further confirming the need for invasive species education. However, respondents believed invasive species should be controlled and were willing to learn about invasive species. Given this interest in learning more and the preferred channels reported, international extension educators should develop educational programs through the use of television, websites, and video. Future studies should examine who participates in these developed programs, the impact they have on knowledge levels and if participation varies between countries depending upon the importance of invasive species to each country.

References


Utilizing Action Research to Discover Best Practices for Global Volunteer Development

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Keywords: Volunteer Development, Best Practices, Military, Youth, 4-H

Introduction
Research has shown distance education and online learning can remove physical and time constraints for the learners (Boettcher & Conrad, 1999). However, online learning might not meet the needs of everyone and can be used to complement other methods of learning (Boettcher & Conrad, 1999; Draves, 2001). Online distance education and face to face trainings for volunteers were explored using action research to support 4-H Youth Development outside the contiguous United States installations (OCONUS) for the Air Force.

Purpose/Objectives
1. Determine the most effective way to provide 4-H volunteer development training empowering the volunteer to develop successful 4-H youth development programs.
2. To enhance volunteer capability and skills in implementing experientially based 4-H curriculum to youth.

Methods
Participatory action research was the methodology used in this project. It is defined as "inquiry that is done by or with insiders to an organization or community, but never to or on them. It is a reflective process, but is different from isolated spontaneous reflection in that is deliberately and systematically undertaken and generally requires that some form of evidence be presented to support assertions" (Herr & Anderson, 2005, P. 3).

The following process was used in partnership with the directors, staff and volunteers:

Selecting a Focus
In 2009, an Extension Team began action planning and a needs assessment of the
OCOUNUS sites. Members conducted staff training in the morning and observed the implementation at youth sites during the afternoon. Reported observations, discussions, and effective strategies were evaluated to adapt training for the next day. This systematic approach was followed for subsequent site trainings.

**Clarifying Theories and Identifying Research Questions**

To verify if the program training was being delivered as intended to participants, program process evaluation was selected (Scheirer 1994). Objective two was met when the Learning Cycle Theory of Kolb (1984), the foundation for the 4-H Experiential Learning Model, was used effectively by staff and volunteers.

**Collecting and Analyzing Data**

Continuous Program Process monitoring was conducted to collect reflective information about the program effectiveness (Scheirer, 1994). Program performance related questions relating to the delivery of the program, barriers, and programmatic needs, were asked through group and individual discussions. Reflections of the day, site observations and written reports were used to triangulate data. In 2010-2011 the team partnered with Boys and Girls Club International Conferences to conduct cluster training as a supplement to distance educational methods used. In 2012 one Extension Agent conducted trainings and monitored outcomes. In 2013, an Extension Team conducted site specific trainings and monitored outcomes and impacts. In 2014, Extension Team conducted site specific trainings and assessed outcomes and impacts made. Program process evaluation both quantitative and qualitative data was analyzed and training was adjusted to meet the changing needs of each site.

**Results**

In the 2009 program year, 45% of the installations had active 4-H programs and continued methods taught twelve months post training. In the 2010 – 2012 program years, 35% of the installations had active 4-H programs and continued methods taught twelve months post training. In the 2013 program year 83% of the installations continued methods twelve months post training and had active 4-H programs. Results of installations twelve months post 2014 training will be presented at the conference. In 2014, 179 volunteers were trained reported learning new skills, 37% reported intent and ability to implement methods taught. With this baseline knowledge, additional impact research and outcome monitoring will be conducted. Additional web modules have also been utilized.

**Recommendations and implications**

Action research is a proven applied methodology to determine the best practices of volunteer development. While distance education is less expensive, experiential learning seems limited in a virtual environment. Six year result trends show that on site, tailored volunteer trainings have the greatest impact in providing a constant positive youth development program. Other volunteer programs would benefit from incorporating onsite training and utilizing action research methodology to improve their programing.

**References**


Utilizing PESTEL Analysis to Identify External Factors that Influence a Successful Education Program in Conflict Regions: A Case Study of South Sudan

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Keywords: PESTEL, post-conflict regions, needs assessments, case study

Introduction
A common approach to measuring external and internal position is SWOT (strengths, weaknesses, opportunities, threats)-analysis. It consists of a comparison between external factors and internal capabilities. Based on the confrontation between the two, strategic options or even a new strategic course can be identified for the organization (Johnson & Scholes, 1999). While the SWOT analysis is a fit tool to use with respect to product potentialities, it is at times broad and inexact and may not always apply well to a changing environment (Bivolaru, Andrei & Purcăroiu, 2009).

Understanding of the performance of an initiative or intervention within a changed environment can be achieved using PESTEL analysis, which focuses on the political, economic, social, technological, environmental and the legal environment (Walsh, 2005). Originally PEST analysis, as an analysis framework of macro-environmental factors, is also referred to as STEP or STEEP (Clulow, 2005). Understanding macro-economic factors such as those found through PESTEL-analysis carry the assumption that the success of a particular organization or management solution cannot be understood without relevant information to the specific environment, which is an issue in South Sudan.

The United States Department of State utilized support programs to improve food security in South Sudan through training agriculturist from the Sudan People’s Liberation Army (SPLA). According to Ghimire and Martin (2011), focusing on training personnel in developing countries assist will assist sustaining food security. The success of professionals in developing regions has a direct relationship to technical competencies and continued training (Kanté, Edwards, & Blackwell, 2013). Measuring environmental condition in the market is also a factor to success.

Purpose and Objectives
This study was conducted to develop an understanding of the external market environmental factors that may influence the success of a training program. More specifically, the study sought to:

1. Gather participant reflections on external and internal factors that influence the success of this program
2. Communicate a synopsis of factors derived using PESTEL analysis

Methodology

A qualitative research design following PESTEL analysis was utilized with a purposively sampled the first, second and third year student in the SPLA training program ($N = 54$). The program objectives were to prepare SPLA members to become extension officers in communities, and educate farmers in growing food to improve food security in the post-conflict South Sudan.

Semi-structured questions following the elements of PESTEL were used to conduct all ($N = 54$) participant interviews. Hand written notes were used to collect and accurately transcribe data from the interviews. A translator was utilized to interpret the data collected from Arabic to English for the researcher’s data analysis.

Results and Conclusions

Due to the limitations of space in the abstract, the following is summary of results. A more detailed review will be presented in the presentation.

In terms of the political (P) influence, twenty-six ($n=26$) responded with concerns such as land ownership, government programs, limited prior education and the difficulties of outsiders understanding the issues. Economic (E) influences included nineteen responses ($n=19$) in the areas of limited income, food, housing, war and the lack of sustained support. Social (S) influences included thirty-four responses ($n=34$) in the areas of separation from families, lack of English skills, health of participants, facilities and the training program is too short. Technology (T) influences included forty responses ($n=40$), which was the largest response area and included not enough equipment, quality equipment, text books or manuals, animal care and management, computers, electricity, increase in specific training areas such as pest management and training for operating equipment. Environmental (E) influences included twenty-nine responses ($n=29$) such as Juba is too hot, poor living conditions at the school, transportation cost and medical care. The smallest response area was legal (L), which included three responses ($n=3$) related to not following through with commitments.

{Program} was mentioned in the political (P), environmental (E) and social (S) areas of PESTEL as a positive to the program and respondents in several areas reported they would like uniforms that relate to {Program} and a degree from the institute.

Recommendations/Implications/Educational Importance/Impact on the Profession

Utilizing PESTEL analysis defines external and internal environments that likely impact the success of extension education programs in conflict regions, which typically offer involve complex issues not easily measured. Findings suggest improved living conditions, training materials and equipment, continual training and specific topic needs, which align to findings from other researchers (Erbaugh et al., 2007; Kanté et al., 2013). This innovative assessment tool also offer a methodology to identify factors that relate to sustaining successful extension and education programs, which are essential to achieve program objectives.

References


Why Won’t They Go: Identifying the Barriers and Motivators Louisiana State University College of Agriculture Students Perceive Regarding Participation in International Experiences

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Introduction
Higher education has been given much responsibility for developing the next-generation workforce. (Mamontova & Bruening, 2005; Punteney, 2012). U.S land-grant universities have been called to reassess their role in the changing global environment, and increase efforts to internationalize curricula (Ludwig, 2007; NASULGC, 2004; Norris & Gillespie, 2009). In an attempt to internationalize higher education and produce globally competent professionals, many universities have increased the time and financial assets allocated for promoting international experiences (IEs) (Childress, 2009; Navarro, 2005; Parsons, 2010; Van Hoof & Verbeeten, 2005). Prior research supports using IEs to supplement international education efforts and help students develop the global perspective and experience they need to succeed in the workplace (Norris & Gillespie, 2009; Ricketts & Morgan, 2009). While enhanced institutional support has increased student participation in such experiences (Salisbury, Brian, & Pascarella, 2013), the number of U.S students who participate in an international experience (IE) during their undergraduate career remains less than 10%. Only 1.3% of these participating students are in agriculturally related majors (Institute of International Education, 2013). To promote IEs among agriculture students, research is needed to examine the motivators and barriers that influence students’ decision to participate. Ajzen’s (1991) Theory of Planned Behavior served as the theoretical framework.

Purpose and Objectives
The purpose of this study was to determine College of Agriculture (CoA) students’ perceptions of IE participation, and identify factors that CoA students perceived as barriers and motivators to participation in an IE. The research questions were (a) What are the selected personal and educational characteristics of CoA undergraduate students? (b) What are the perceptions of CoA undergraduate students regarding interest, importance, time of year, duration, and cost concerning participation in an IE? (c) What factors do CoA undergraduate
students perceive as motivators of participation in an IE? (d) What factors do CoA undergraduate students perceive as barriers to participation in an IE? (e) Are there differences in CoA undergraduate students’ perceptions of motivators of participation in an IE based on their academic status? and (f) Are there differences in CoA undergraduate students’ perceptions of barriers to participation in an IE based on their academic status?

**Methods and Data Sources**

The study’s population consisted of all Louisiana State University CoA students (N = 1,336). The frame used for the study was the CoA fall semester course schedule. A random sample of five courses from each academic status level (e.g., 1000, 2000, 3000) was selected using a cluster sample. The student sample used was n = 721 students. A questionnaire (Bunch et al., 2013; Lamm & Harder, 2010; Reiger, n.d.) was used to collect data face-to-face. Questionnaires were collected from 444 of the 721 students for a response rate of 61.5%. Reliability estimates were calculated on the motivators (.84) and barriers (.84) constructs post hoc. Descriptive statistics and one-way ANOVA were used to analyze the data.

**Results and Conclusions**

The majority of CoA students were interested in participating in an IE. Students who sought information on IEs were likely to do so through friends, word of mouth, or the study abroad academic websites. Overall life experience was the only motivation item CoA students perceived as very important. Regarding perceived barriers, students indicated they could not afford to participate in an IE and that they were too busy with school to participate. No differences were found in the perceived motivators or barriers of CoA students based on their academic status.

**Recommendations, Educational Importance, Implications, & Application**

Because CoA students indicated that friends and word of mouth were their preferred means of acquiring information on IEs, university faculty should encourage students who have participated in an IE to provide presentations to other CoA students. Further, these presentations should focus on the overall life experiences students gained from their IE participation, and should be informal in nature to allow for peer-to-peer discussion. In addition to peer support, advisors and faculty members can contribute to students’ positive perceptions concerning IE participation as a subjective norm (Ajzen, 1991) and, therefore, increase the likelihood they will participate. CoA faculty should help reduce students’ perceived barriers by assisting students in allocating funds, as well as working with students to incorporate IE courses into their academic track (Kim & Goldstein 2005; Spiering & Erickson, 2006). This study should be replicated at other peer and regional universities for comparison, and a longitudinal study could be conducted to identify trends over time. Additionally, differences in gender and major, regarding barriers and motivators should be examined.

**References**


Will Vegetable Farmers Pay for Private Extension Services in Trinidad and Tobago?

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Keywords: privatized extension services, vegetable farmers, willingness to pay

Introduction

In many developing countries, delivery of extension services to farmers are constrained by limited resources and as a result, there has been a reduction in funded programmes provided by the public extension (Swanson, Bentz & Sofranko, 1997). An alternative strategy of funding extension services can be service privatization where recipients (farmers) pay for the service received. The Netherlands, New Zealand and Chile have adopted similar services (Rivera & Cary, 1998). The successful execution of a privatized extension service in any country requires thorough understanding of the factors that influence a farmers’ willingness to pay for receiving the services. For farmers to adopt new farming technologies there must be a low risk factor in terms of the costs associated with the technology. It is likely that farmers will adopt new technologies if the service is free and will later pay for the service if it was effective (Howley, Donoghue & Heanue, 2012). Currently, there is a pluralistic extension system in Trinidad and Tobago, all of which are free to farmers. As such, the introduction of a privatized service with a known price mechanism to farmers is based on the assumption that they will receive a general improvement in the service provided. Therefore, this study assumes the existence of an efficient private extension service is highly likely.

Purpose and Objectives

The purpose of this study seeks to determine whether vegetable farmers in Trinidad and Tobago will pay for an efficient privatized extension service in lieu of it being traditionally offered as a public service. The objectives of this study were to determine the type of extension services that vegetable farmers require at different stages of the crop cycle, to identify the factors that affect vegetable farmers’ willingness to pay for specified extension services and to determine the vegetable farmers’ general perceptions of the current public extension.

Methodology

The study used primary data ascertained from a structured questionnaire designed according to the Contingent Valuation method (CV). The CV questionnaire contained a combination of open ended, close ended and likert scale questions. Three hundred vegetable
farmers (n=300) across Trinidad and Tobago were interviewed conveniently. Data were cleaned and analyzed using the Statistical Package for Social Sciences (SPSS v17). The data was analyzed using a combination of non-parametric tests and ANOVA.

Results and Conclusion

The data collected showed that majority of the farmers interviewed were male between the ages of 50 – 65. Results of the ANOVA model suggested that farmers with higher education levels and farmers who owned and rented lands were willing to pay less for services prioritized at the crop maintenance phase of the crop cycle. Farmers with no land tenure were willing to pay less for services prioritized under the land preparation and planting phase and the post-harvest phase of the crop cycle. The findings of this study indicated that many of the farmers interviewed had a negative perception of the public extension service in Trinidad. Based on the results of the analysis, the majority of vegetable farmers in Trinidad and Tobago were unwilling to pay for privatize extension services even though they considered the public extension services to be inefficient. Although the public extension service was perceived as inefficient and it is expected that extension is a free public good means that farmers’ would rather receive a free, inefficient public services than pay for any private service.

Recommendations and Implications

Results of this study indicate a high level of unwillingness to pay for any privatized extension service with a pricing scheme. It is unlikely that all farmers adhere to this concept however; the results serve as a preliminary assessment of a (hypothetical) privatized extension service. Future research should aim to determine the public cost of providing an efficient public extension service and possible cost recovery methods. However, the notion of properly maintaining a free efficient public good such as extension should be re-considered due to its economic impracticalities.

Reference


**Women and Food Security: Preserving Women’s Agency and Wellbeing**

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**Keywords**: Women, food security, Agency

**Introduction**

All people have a right to food. Yet, an overwhelming number of people, estimated at 842 million people or 1 in every 8 in 2011-2013, suffered from chronic hunger worldwide (FAO, 2013). Women and girls are dramatically overrepresented amongst the suffering from chronic hunger (World Food Programme, 2009). Women’s roles in securing familial and household food security have been well documented. Women have been seen as food producers, keepers of traditional knowledge, preservers of biodiversity, food processors and preparers, and overall food providers for their families (IFPRI, 2000; Karl, 2009). Women make these contributions despite unequal access to land, inputs, and to information (Quisumbing, Brown, Feldstein, Haddad, & Pena, 1995).

Capitalizing on women’s roles is essential to targeting household food security. Development efforts have done this by directing many of their efforts to increasing women’s effectiveness and abilities in these roles. However, looking at it from a different perspective, what about the women? How are the women’s rights as individuals being preserved? A critical look at interventions is important to identify is women are being used to address familial food security at the expense of their own agency and wellbeing.

**Purpose and Objectives**

Understanding how food security interventions and development efforts affect women is essential in ensuring that their wellbeing is not compromised for the sake of their families. The overall purpose of this study is meant to critically look at certain efforts to increase familial and household food security and how they affect the women they are using to achieve the ultimate goal. The objectives are to critically examine various efforts to maximize women’s roles in household food security and determine if they take the women themselves into consideration in their efforts. Such an analysis can be helpful to development and extension practitioners.

**Methods**

Secondary data in the form of existing literature was synthesized to investigate previous interventions that address household food security through the roles of women. Both peer reviewed and reputable non-peer reviewed articles were used in this study. Non-peer reviewed publications were primarily published by international development agencies. Key phrases such as women and food security, women as agricultural producers, women, biodiversity and food security, food processing and food security were all used to search Google scholar, [the
university] library, and the ProQuest database. Note that word limits prevent a thorough discussion of all the literature reviewed. However, an oral presentation will be much more in depth.

**Conclusions**

There were many interventions that targeted women to increase overall household food security. Several interventions had unintended consequences for women. There is evidence of increased demands on women’s time, reduction of women’s agency, and increased exposure to chemical agricultural inputs. These interventions were meant to increase household food security. However, through implementation, they had varying effects on the women of the household. For example, for a program in Bangladesh, the goal was to improve and expand women’s farm activities, including encouraging cash crop production for export through provision of improved seeds, fertilizers, and pesticides (Rengam, 2001). The provision of new seed varieties took away women’s control over seeds and her knowledge and skills were seen as inconsequential. This reduced women’s agency in the household and also increased women’s exposure to pesticides and fertilizers. Another study in Ghana encouraged women to change traditionally grown yam to cassava production, (Templeman, 1998). While this change reduced production labor input, the processing and storage time were more than the previous crop. Women’s time use changed causing them to make concessions that often resulted in less personal time. Women’s simultaneous competing demands on their time along with labor burdens and long working hours, caused them to have to make choices and tradeoffs that increase their time burdens (Kes & Swaminathan, 2009).

**Implication and Recommendations**

While women play important roles in household food security, their wellbeing should always be taken into account. When encouraging women to increase their production, increase household income, or increase their overall contribution, consideration to how their health, time, and agency will be affected is essential. Extension services can be reformed to better serve women and thus increase overall household food security. Understanding the intricacies surrounding women and agriculture can help extension agents decrease gender inequalities that continue to be pervasive (World Bank & IFPRI, 2010). Extension services can help women by introducing improvements in labor-saving techniques which reduce the number of hours women work, thus freeing up poor women’s time. Furthermore, agricultural research and development must account for the specific constraints faced by women and their preferences.

**Resources**


Six Points of a successful Rice Extension Programme in Guyana

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Introduction

The rice industry is currently the largest agricultural industry in Guyana. It is the bedrock of the Guyanese rural economy and over the last two years it became the main contributor to export earnings. Rice accounted for about 37% of agricultural GDP and 14% of total exports in 2013 (MOA, 2013, p. 28). It is the greatest user of arable land with approximately 8,000 families directly and 150,000 indirectly associated with the industry. Two rice crops are cultivated annually.

Government strategy to improve rice production focused on a coordinated technology transfer effort to empower farmers on innovative strategic management practices that, when applied, will result in significant yield increases.

The Guyana Rice Development Board (GRDB) provides extension services for the rice farming sector. In 2007, the Extension Manager travelled to neighboring Venezuela as part of a planned educational tour to evaluate the rice production technologies being practiced there for possible adoption in Guyana. Consequent upon this visit, a set of six improved management technologies (renamed “six points” in Guyana), was introduced and the GRDB sought to educate farmers through various farmer-group activities. Various reports (MOA, 2013, p. 30, GRDB, 2013) show significant increase in rice production since 2007. However, no study has been done to assess the adoption of the “six points” by farmers and its impact on yields and outcomes.

Purpose

The purpose of this study was to (i) assess the extent of adoption of the “six points” technology package, (ii) reflect on the process that led to achieved outcome and (iii) make recommendations for other commodity programmes.

Methodology

A mix of methods was used: (i) a formal survey using a structured questionnaire which was administered to 454 farmers in July 2014 selected using proportionate random sampling. Data were collected on adoption of the “six points”, yields, participation in extension activities and perception of extension’s intervention, and (ii) a post survey reflective interview with the
Extension Manager to detail the methodological process of the introduction of the technology and to evaluate the extension approach used.

Results

Survey results
Farmers’ main information source was Extension officers (87%) and the majority (49%) of farmers attended up to six extension activities in the last year. 60% participated mostly in Farmer Field Schools and 69% demonstrations. The majority of farmers (66%) had been practising the six points for up to three years; 29% for up to five years and 5% up to seven years. Overall, there was a high level of adoption (84%) of the “six points” technology package. Adoption of the individual components varied however: highest adoption was for “Time of planting” and “Treatment of Seeds” (95% respectively); 84% adopted “Weed control” and “Use of Mixed fertilizer;” 81% adopted “water management” and 67% (the lowest) adopted “Density of Planting practice.”

Overall, the “six point” technology package was applied to over 80% of each farmer’s holding. The majority of farmers (65.7%) reported up to 40% increase in yield; 29.3% reported up to 60% yield increases while 5% reported even higher yields. Most farmers (66%) reported that Extension contributed “a lot” to their achievement of these higher yields, 27% reported “some contribution” and 10%, little or no contribution.

Post survey reflective interview results:
The methodological approach used by the Extension Manager can be summarized in six points.
1. Desk research of available technologies followed by attendance at workshop in nearby rice producing country.
2. Site visit to survey technology use by farmers in chosen country
3. On-farm validation in home country of a package of six new technologies bundled together and renamed the “six points” technology package in collaboration with farmers.
4. Use of on-farm validation and result demonstrations to further adjust the “six points” based on farmers’ recommendations.
5. Country-wide roll out of the “six points” using farmer Field Schools as the main education activity.
6. Regular “End of Season” review sessions as evaluation method to plan for next rice season.

Conclusion

Main conclusions are that (i) Extension had a significant impact on the improved yields of rice through the adoption of the “six points” technology package, and (ii) There can be no substitute for sound extension practice as evidenced by the methodological approach, that is based on grounded theory (Qamar, 2005).

Recommendations
The methodological approach should be adopted in the other commodity extension systems and (ii) suitably adapted and offered to the state extension system which services smaller farmers in mixed farming systems in Guyana.

References

