The *Journal of International Agricultural and Extension Education (JIAEE)* is the official refereed publication of the Association for International Agricultural and Extension Education (AIAEE). The purpose of the *JIAEE* is to enhance the research and knowledge base of agricultural and extension education from an international perspective. Acceptance rates for the past five volumes are: Volume 20 = 21%. Volume 21 = 13%. Volume 22 = 18%. Volume 23 = 12%. Volume 24 = 18%. Volume 25 = 9%. Volume 26 = 26%.

Articles intended for publication should focus on international agricultural education and/or international extension education. Articles should relate to current or emerging issues, cite appropriate literature, and develop implications for international agricultural and extension education. Manuscripts, or portions of manuscripts, must not have been published or be under consideration for publication by another journal.

For publication in the *JIAEE*, manuscripts must pass the *JIAEE*’s double blind, referee process, where peer reviewers evaluate manuscript content and ensure readability. Reviewers are selected from the AIAEE membership. In the double blind, referee process, all references to authors are removed before the manuscript is sent to reviewers. Articles may be submitted for peer review a total of three times before they are no longer acceptable for publication in the *JIAEE*. Failure to meet the submission formatting guidelines will result in an automatic first rejection.

Two different types of articles are solicited for the *JIAEE*: Feature Articles and Research Notes.

**Feature Article**
A Feature Article should focus on philosophy, current or emerging issues, and the methodology and practical application of specific research and appropriate technologies, which have implications for developed and developing countries. Conceptual/Theoretical and Methodological manuscripts are also encouraged as submission for feature articles. If applicable, a feature article should report the findings from a fully investigated study. Feature articles are no longer than 20 double-spaced pages, excluding references.

**Research Note**
A Research Note is a concise but complete description of a limited investigation that will not be included in a later manuscript. It serves one of the following purposes: (1) presents initial proof-of-concept results on new ideas or program evaluations, timely issues, or innovative approaches; (2) reports replications or extensions of previously published research that does not merit another full-length manuscript yet provides results that contribute to a greater understanding of the phenomena under study. Research Notes are no longer than 10 double-spaced pages, excluding references.
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From the Executive Editor

“There are far better things ahead than any we leave behind.”
- C. S. Lewis

The world is changing; changing rapidly. It is hard to keep up and (despite what C. S. Lewis says) it is even harder to envision what lies ahead is somehow better than what we left behind. We now keep distance from one another, we wear masks, many children were - and will continue to be - educated virtually from home, and educators at all levels are altering their classrooms and styles of teaching. Extension professionals find themselves seeking alternative ways to reach out to clientele since face-to-face communication has become more difficult and sometimes impossible. Terms used infrequently have become everyday occurrences: social distance, hybrid classrooms, and virtual meetings.

As agricultural and extension educators, communicators and leaders around the world, we are used to studying change. We examine how to alter how people think, believe, feel and act – behavior change is what we seek – whether it be changes in how we grow crops, changes in how we educate, changes in how we ensure a sustainable environment for future generations, or changes in how we keep our communities safe. We are seekers of change; identifying best practices for educating and communicating with others so they can change and make the world a better place. Despite all this, change in our own lives, and the disruptions occurring across our global society, can feel overwhelming and extremely difficult to navigate.

Look through the August 2020 issue of the JIAEE and you will notice a wide variety of research projects that examine change in many capacities. First, you will find two Research Notes of interest: both of which examine ways to support educators and entrepreneurs as they strive to change their businesses and extension systems. These are brief, to the point, pieces that offer real world examples of the power of mentoring and building supportive systems to achieve goals.

Moving into our Feature Articles, I encourage those of you seeking new research methods to take a good look at the research projects conducted by Borron et al., Roberts et al., and Dobbins et al. that offer new scales and examples of less often used research methods. They are all intriguing pieces that provide insights into new ways of doing research. In addition, you will find two articles testing adoption models that could be applied around the world including the Integrated Extension Model, tested by Sarker et al. in Bangladesh, and the Concerns-based Adoption Model, tested by Mize et al. in Cambodia. There are also several studies examining the effectiveness of agricultural communications that are extremely informative as we are all being asked to come up with creative, distanced, ways of reaching our clientele.

I encourage you to read the articles in this August 2020 edition of JIAEE cover-to-cover recognizing that change and uncertainty can be difficult, but there are “far better things ahead.”

Sincerely,

Alexa J. Lamm, PhD
Executive Editor, Journal of International Agricultural and Extension Education

African Entrepreneurs’ Perceptions on the Mentoring Provided by a Cross-cultural Professional Development Experience: Implications for Future Programs

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Abstract
We conducted a multicase investigation to assess the impacts of a cross-cultural exchange program on Entrepreneur Fellows from Kenya, South Africa, and Uganda (8 women; 14 men) after they had returned home from the United States. Our assessment included the mentoring aspect of the program. Six questions and related probes guided semi-structured interviews with the 22 Fellows, the study’s quintain. The lead researcher transcribed the study’s interviews and verified accuracy and trustworthiness by sending her transcriptions to the Fellows for verification. Findings derived from the interviews or cases crystallized as themes representative of the quintain. The emergent themes, which included mentoring, inspired two theoretical lenses to guide our interpretation of the Fellows’ experiences: human capital theory and theory of planned behavior. Recommendations for practice include additional training of entrepreneur mentors and suggestions to facilitate high-quality field experiences. Additional research examining participants’ views about mentoring – protégés and their mentors – as an integral component of entrepreneurial training in cross-cultural settings, and how that can be improved, would likely enhance the learning outcomes of similar programs.

Keywords: entrepreneurship; international exchanges; mentoring; professional development
Introduction, Conceptual and Theoretical Lenses

“The world now has the largest generation of young people in history. . . . They are part of the first generation that can end poverty and the last that can avoid the worst impacts of climate change” (United Nations [UN], n.d., para. 3). Young people are more likely to create a better future if they have real influence, negotiating muscle, political weight, and decent jobs (UN, n.d.). To achieve this aim, Collier (2007) asserted that “societies of the bottom billion can only be rescued from within. . . . [T]here are people working for change, but usually they are defeated by the powerful internal forces stacked against them. We should be helping the heroes” (p. 96). These heroes include entrepreneurs focused on the agricultural and food sectors of their respective nations.

“With few exceptions, international comparative studies of entrepreneurship are rare, hampered by barriers such as the difficulty in gaining access to entrepreneurs in other countries, the expense involved, and the lack of reliable, published data” (Thomas & Mueller, 2000, p. 289). The project examined here provided training that created access to agricultural and allied sector entrepreneurs and entrepreneurship facilitators (Thomas & Mueller, 2000), such as food producers and purveyors, business educators, Extension leaders, and researchers, among other mentors. During the training, participants received various types of mentoring related to their entrepreneurial interests. The fellowship experience provided three unique, field-based, learning opportunities involving mentoring relationships: 1) a sustained experience with one mentor (≥1 week); 2) combination of more than one sustained experience and compatible job shadowing activities (1 or 2 days each); or 3) a series of related job shadowing experiences. Reporting on the mentoring experiences of the participants was the primary aim of this manuscript, as findings derived from a larger inquiry (Taylor, 2017; Jayaratne et al., 2017).

The study’s conceptual lens was human capital theory (HCT) from the viewpoint that “individuals and society derive economic benefits from investment in people” (Sweetland, 1996, p. 341). The entrepreneurship education program (EEP) in which the study’s subjects participated was a significant investment in their human capital (Sweetland, 1996) as entrepreneurs, especially regarding efforts of the mentors with whom they interacted (Taylor, 2017). The inquiry was also informed by the theory of planned behavior [TPB] (Ajzen, 1991). According to the TPB, behavioral change emanating from experience is related to intentions held by individuals before their involvement in such and what, in this case, occurred during the EEP or fellowship. We expected the Entrepreneur Fellows’ (EFs’) attitudes would be informed by the skills and knowledge they perceived learning during the EEP, i.e., their future perceived behavioral control (Ajzen, 1991) as entrepreneurs, and the inspirations likely to impact forthcoming actions (Kuckertz & Wagner, 2010). According to Gird and Bagrain (2008), perceptions of implementing an action or behavior may grow from what significant people in a person’s life express about a specific behavior such as entrepreneurial practices and activities. We examined whether mentors were referents for the EFs and affected their perceptions and actions, i.e., normative beliefs (Ajzen, 1991) and post-fellowship behaviors (Gird & Bagrain, 2008).

Statement of the Problem

“Africa is at the crossroads. Persistent food shortages are now being compounded by new threats arising from climate change” (Juma, 2011, p. xiv). New opportunities that could facilitate transformation of African agriculture to be an economic force for growth are being guided by a new group of African leaders, according to Juma (2011). These leaders, who in many cases are
entrepreneurs, need assistance. “National, regional, and local economic development agencies use entrepreneurial mentoring as one ingredient in a wide assortment of assistance programs to help entrepreneurs and small business owners . . .” (Bisk, 2002, p. 262). Role identification, communication, relational climate, and relationships built among compatible pairs were discussed as critical to successful goal attainment by participants in coaching and mentoring experiences (Milner, Ostmeier, & Franke, 2013). Return on the investments made to structure and facilitate the EEP’s mentoring relationships, i.e., programming time, resource expenditures, social capital costs, and so forth, was unknown. This knowledge gap supported conducting an inquiry to understand the EFs’ views on their mentoring experiences.

**Purpose and Research Question**

This study sought to describe EFs’ perceptions about the mentoring component of a professional development program, especially regarding its impact on their entrepreneurial attitudes and practices after they returned home. To achieve this aim, the project’s guiding research question was “What were the EFs’ perceptions of the entrepreneurial mentoring received during the fellowship program?”

**Methods/Procedures**

**Study Participants, their Enterprises, and the Professional Development Program**

The fellowship experience providing this study’s data involved 23 participants from Kenya, South Africa, and Uganda, including 9 women and 14 men who visited the United States during one of two cycles (12 in cycle one; 11 in cycle two). In May of 2014, the first group trained in Oklahoma for four weeks and a second group participated during October of 2014; 22 EFs provided data. The boundaries of the study’s cases included the EEP’s timeframe and the participants themselves (Stake, 2006).

The EFs ranged in age from 26 to 47, with an average age of 34 years. They were primary owners/managers of 32 businesses and social ventures; 10 were involved with agricultural production activities and several worked as food purveyors. Six entrepreneurs described providing assistance to agriculture producers; 10 specified holding agricultural education, management, and leadership positions with Extension, government, or higher education institutions. Fifteen of the 22 EFs led more than one organization and/or venture. Seven indicated involvement in one primary venture, e.g., agricultural media consulting, a career development organization for adolescents, and an upmarket coffee shop. When the EEP transpired, one EF held an advanced degree in veterinary medicine. Two were working toward earning doctoral degrees, and three had earned master’s degrees while eight were studying for such. The EFs were provided with numerous opportunities to learn from cross-cultural exchanges with U.S. citizens during the EEP. More than 60 field experience providers from agricultural enterprises, Cooperative Extension Service offices, educational entities, entrepreneurial ventures, other government agencies, and non-profit groups voluntarily served as mentors. Field experiences that involved mentoring were considered an essential part of the EFs’ professional development activities (Taylor, 2017).
Ensuring a High-Quality Qualitative Study

Purposeful steps were taken to ensure the quality of this qualitative multicase study based on protocols supported by Stake (2006), Tracy (2010), and Saldaña (2013), including presentation of the participants’ views on mentoring as representative of a group or *quintain* (Stake, 2006). Face-to-face interviews with 15 EFs were completed in May of 2015. The other seven interviews were conducted in summer of 2015 using Skype or Google Hangout. The lead researcher transcribed the interviews verbatim.

Three main criteria guided the compilation and analysis of the study’s data: how each case was relevant to the quintain; the diversity of the cases across the quintain; and how each case provided an opportunity to learn about the contexts and complexities of the quintain (Stake, 2006). In concordance with Stake (2006), “the transcriptions and codes were triangulated and then a cross-case analysis was conducted by the researcher” (p. 39). Knowledge was mobilized from each case during cross-case analysis. This mobilization occurred first as case knowledge was acquired; second, when cases were compared; and, finally, as new knowledge emerged (Khan & VanWynsbergh, 2008) from our interpretations of meaning based on analysis of the cases. Coding was performed at open, axial, and selective levels (Strauss & Corbin, 1990). Responses provided during the interviews were subjected to initial word-for-word content analysis. This In Vivo Coding (Saldaña, 2013), meaning *in that which is alive* (Strauss, 1987), was done by examining each word or small phrase in audio recordings of the EFs’ interviews. Coding categories were derived directly from this textual data (Hsieh & Shannon, 2005).

The segmentation of data into alike groupings and comparing such for similarities was completed next, which reflected Creswell’s (2007) open coding process. Constantly comparing the data during coding increased the likelihood of eliminating ambiguity and identifying meaning across codes (Creswell, 2007). More codes emerged as comparison of the data ensued.

Axial coding was expedited by NVivo software to compare existing codes using search methods for both terms and key phrases, which revealed the essence of the perceptions expressed by the study’s quintain. Selective coding practices were used in the exploration of relationships between codes and the primary categories identified (Strauss & Corbin, 1990). Although codes were applied to the data, themes ultimately arose from the selective coding conducted during cross-case analysis (Stake, 2006), which fomented emergence of the study’s conceptual and theoretical lenses of HCT (Sweetland, 1996) and TPB (Ajzen, 1991). A distillation of the EFs’ views on their mentoring experiences was a predominant theme (Creswell, 2007), as derived from our analysis.

To increase trustworthiness of the data, notes written during the interviews by the lead researcher were combined with related details documented immediately after each interaction with an EF. According to Britten (1995), this procedure coupled with verbatim transcriptions of the audio recorded interviews are indicative of high-quality, qualitative research practices. Transcriptions were provided to the EFs through electronic mail for member checking to ensure credibility and accuracy of the data (Creswell, 2007). Changes and clarifications were made as requested by the EFs. This practice was also employed to ensure that errors in interpretation due to language differences related to meaning, control, and relevance between the English spoken by the participants and that of the lead researcher were revealed and eliminated.

Rich rigor existed because the 22 cases contained an abundance of insights as the participants described experiences in the United States with relevance to their entrepreneurial enterprises and the mentoring relationships developed during the fellowship. Credibility of the
findings was strengthened by the inclusion of multiple and varied voices, i.e., different ages, entrepreneurial enterprises, genders, and socio-economic statuses. This aspect reflected the multivocality of the quintain (Tracy, 2010).

**Researchers’ Reflexivity and Backgrounds**

As a constructivist (Crotty, 1998), the lead researcher believes that individuals construct meaning in different and specific ways, even regarding a mutually experienced phenomenon. The meaning of the EFs’ perspectives was co-constructed by her and the 22 study participants through their interactions and the investigator’s reflections on and interpretations of such discourses. Engagement with the EFs allowed her to explore unique ways to examine the phenomenon in light of the myriad voices and perspectives shared during the 22 interviews.

A reflexive journal was kept to record impressions and preferences that may have influenced interpretation of the data. We acknowledge the potential for bias due to our involvement with the development and delivery of many aspects of the EEP that made the study possible. Daily participation interacting with project team members, invited experts, the EFs and their internship/job shadowing mentors also provided opportunities to acquire and manifest bias. In addition, such involvement included a two-week exchange during which three of the researchers and other Oklahoma State University collaborators traveled to the EFs’ home nations for follow up work.

The lead researcher was educated as a vocational home economics teacher. During her teacher preparation, she studied, developed, and taught a six-week instructional unit with a Nigerian vocational home economics teacher. That was her first experience working with an individual from Sub-Saharan Africa (SSA). The other researchers included two agricultural educators, an Extension educator, and an entrepreneurship expert. Two had worked extensively with other professionals from SSA and three had traveled to the EFs’ home countries. All were faculty members at Oklahoma State University during the study.

**Findings Regarding the Fellowship’s Mentoring Experiences and Related Interpretations**

Analysis of more than 235 pages of interview transcriptions and related data, such as the lead researcher’s notations made during the interviews, resulted in 15 significant categories, including five themes (Taylor, 2017), of which one theme explicates the EFs’ mentoring relationships. The mentoring experiences were unique to each EF. The outcomes were generally described in three ways: impactful connections with a variety of U.S. contacts, ongoing relationships with one or more mentors, and interactions inspired among the EFs themselves (see Table 1).

<table>
<thead>
<tr>
<th>Selected Perspectives held by Entrepreneur Fellows related to their Mentoring Experiences</th>
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<tbody>
<tr>
<td>“In the U.S., people share information with each other. And currently I have a group of U.S. people who we get together and we are able to share information. . . . I can now get information from the Internet which I learned in my program and it is applicable in my work and I am able to share it with my workers to better the jobs they are doing.” (P19 Interview)</td>
</tr>
<tr>
<td>“[D]ifferent types of mentors show[ed] me how to plant crops, how to grow, and how to harvest. . . . I took them [practices] back to my country and taught the women I am working with. . . . The mentors were even teaching me types of irrigation skills. . . . [W]e used to use the bucket system where we were sprinkling and it takes so long. It discourages women from</td>
</tr>
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</table>

Table 1
continuing planting and food gardening. . . . I learned drip irrigation system to put in under the ground. . . . I implemented these things and they are working.” (P03 Interview)

“[Name] helped me design an easier way of breaking down the curriculum to help people who did not go to school. . . . I apply my knowledge in my business and she[,] my mentor[,] continues to guide me.” (P15 Interview)

“[My mentors] put it plainly to me [that] they would like to visit Africa in two years and visit my farm. I set myself a goal to have a farm where I could host them in two years. But the bigger picture of that is that there is an opportunity in creating an activity or an experience where American business people or entrepreneurs or researchers can come and live on a farm in Africa. . . . In that way, here we will be benefiting from some kind of knowledge transfer. . . . [H]aving those folks around for a month and so forth would be of tremendous benefit . . . .” (P13 Interview)

“[Another Fellow] moved from [City A] to [City B] and I moved from [City B] to [City A], so we have been linking. . . . I have told him when I set up my new agribusiness farm, I will let him market his fertilizer from that location. In this way, we can have an enterprise together. . . . That’s a way of connecting markets, you can both make a profit. Also, I would like to learn how he does [composting] so we will keep sharing new ideas and other information.” (P16 Interview)

“I did talk with [another Fellow] because it has been very funny that where our company is located near where he grew up and his mother lives. And where [another Fellow] works is where I come from. Where my father lives. It’s been quite an exchange.” (P17 Interview)

“I never quite got a specific mentor like [Name] did. . . . But, I consider [name of team member] a really strong mentor and yourself [the lead researcher] and the rest of the team.” (P18 Interview)

Two broad purposes Kram (1988) identified for mentoring were (a) facilitating a career-defining purpose for protégés and (b) achieving the psychosocial purposes of role modeling, acceptance, counseling, and friendship. Members of the fellowship’s delivery team recruited more than 100 individuals to assist the EFs at professional, technical, and/or personal levels as mentors for field experiences. Recruitment occurred on a person-by-person basis to select the most appropriate mentors possible for the EFs. Analysis of the EFs’ interview responses related to the interactions they had with these mentors identified eight who described ongoing relationships as impactful on their entrepreneurial activities. In addition, 12 other EFs indicated communicating with two project team members who assisted in facets of their ventures.

Implications of Milner et al. (2013) study emerged regarding the cross-cultural relationships inherent to many of the EFs’ field experiences, including length of relationships, settings of mentoring experiences, ways of communication, and mutual understanding of their roles.

Overall, the EFs’ views also confirmed Clutterbuck’s and Megginson’s (1999) assertion that mentoring enables one person to assist another in transitioning their knowledge, thinking, and work practices with long-ranging, important ramifications on a variety of levels, i.e., from individuals to communities to whole societies. The interviews also reflected the EFs’ gratitude for the efforts and resources expended, i.e., investment, to provide the various mentor-protégé interactions. They spoke about how the relationships with mentors had changed their entrepreneurial perspectives and practices. Such was represented in one EF’s comment: “The
American people should not take for granted the fact that their money provided through the fellowship is making an impact in our countries. It may not be an immediate difference but it long-term will make an impact” (P01 Interview).

**Conceptual Lens**

HCT recognizes that education, specifically apprenticeships, is a real expense with an expected economic impact (Sweetland, 1996). Albeit this study was qualitative, concrete examples of economic benefits were found to be derived from investments the EFs reported making in their enterprises (Sweetland, 1996). For example, descriptions of the efforts mentors made to guide and train employees were reported as resulting in positive financial outcomes by the EFs due to their adoption of similar practices (see Table 1). Although not quantitatively confirmed, the cases provide evidence to funders and policy makers that the EEP was an effective way to build human capital (Dunn & Holtz-Eakin, 1996; Sweetland, 1996; Unger, Rauch, Frese, & Rosenbusch, 2011) with the potential to make positive economic impacts.

**Theoretical Lens**

Most of the EFs intended to develop collaborative networks and relationships during the EEP, as described by their goals for such. This reflected attitudes toward executing given behaviors (Ajzen, 1991). Moreover, subjective norms, i.e., “perceived social pressure to perform or not to perform [a] behavior” (Ajzen, 1991, p. 188), were described as important determinants of the EFs’ behaviors.

During interviews, the EFs explained the impact of networks and colleagues influencing their entrepreneurial activities after returning to their home countries. Examples included an EF’s business partner as integral to her developing a pork processing, packaging, and delivery business; employees’ input resulting from their trying a variety of marketing strategies to increase an EF’s frozen yogurt sales; and a board of female community leaders advising an EF about the scope and direction of empowerment activities for rural girls. Expressions of increased perceived behavioral control (Ajzen, 1991) were revealed in the EFs’ statements about building relationships with employees, work colleagues, and community members. For instance, one EF explained:

> [W]hen I came back from the U.S., people had a lot of expectations of me. So, I have been sharing information with them. I shared encouraging messages to the young men and women of this nation to work hard and at least to pursue their cause according to what I saw in the U.S. (P19 Interview)

This example reflects quintain members’ willingness to model what they viewed as successful relationships of U.S. business owners with co-workers and employees and conveyed confidence and enablement to use their acquired knowledge and skills to follow through on intentions to exploit practices likely to benefit themselves and others (Drucker, 1985). It also embodies Ajzen’s (1991) three kinds of salient beliefs – behavioral beliefs, normative beliefs, and control beliefs – which he indicated were “prevailing determinants of a person’s intentions and actions” (p. 189) [see Figure 1].
Implications and Recommendations

Several unanticipated factors influenced the field placements chosen to instigate the EFs’ mentoring relationships. These included biosecurity concerns eliminating internships for international visitors during the EEP, i.e., disease outbreaks causing livestock producers to restrict access to their operations to reduce the potential of transmission risks; and competitive global marketing of food products restricting access to proprietary elements of manufacturing facilities. The EFs expressed mixed reactions to such restrictions that resulted in short-term job shadowing experiences being arranged rather than internships with one primary mentor. For example, an EF who had multiple mentors indicated: “The many experiences I had, the contacts I have made, the work I am now doing, the courses I am taking, they are having impacts in [Country]” (P01 Interview). In contrast, another EF – a marketer of pork – commented: “I really did not have any one person[, i.e., mentor,] and that was a really big disappointment for me” (P18 Interview). And a third EF, who had experienced apartheid in his nation, reflected on his short-term, job shadowing placements:

[I]t was a very nice experience to be treated as a person. And where your color played no role. To be accepted amongst people as a person . . . and being treated as a person [and] not a second-class citizen . . . was what I noticed and what I appreciated. (P07 Interview)

The EFs’ unique perspectives on field experiences conveyed the breadth of impacts described during the study’s interviews. However, a longitudinal study of the enduring influences of U.S. internships/job shadowing experiences on international entrepreneurs would provide valuable insights about long-term outcomes resulting from EEPs. Mentoring relationships, internships and/or job shadowing experiences, understanding of participants’ roles, and the type and substance of related communication were four critical aspects of the EFs’ field experiences, as well as indicative of and congruent with important indicators of compatibility in cross-cultural pairings (Milner et al., 2013). Research studies that examine the perceptions of
international entrepreneurs and their mentors about shared learning experiences vis-à-vis these indicators would be beneficial to leaders of cross-cultural exchanges and instructive if selecting participants for similar programs in the future. Table 2 reflects recommendations for practice by program leaders soliciting and preparing volunteer mentors to participate in cross-cultural, EEPs.

Table 2

<table>
<thead>
<tr>
<th>Recommendations to Recruit and Support Volunteer Mentors for International Entrepreneurs</th>
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<tr>
<td>1. Recruiting and selecting volunteer mentors who value global relationships can aid in creating compatible mentoring experiences.</td>
</tr>
<tr>
<td>2. Focus mentor preparation on identifying long-term opportunities that can give the richest experiences and meet goals of both protégés and mentors.</td>
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<tr>
<td>3. After mentor and fellowship participant selection has occurred, provide training for both groups to build mutual understanding, to increase future rapport, and to decrease apprehension.</td>
</tr>
<tr>
<td>4. Develop, maintain, and promote new media sites and related mobile telephone apps as tools for scheduling events, and for posting training agendas and materials, internship/job shadowing arrangements, emergency contact information, travel specifics, and institutional opportunities.</td>
</tr>
<tr>
<td>5. Develop and discuss field experience plans with mentors prior to an EEP to provide clear expectations, to answer questions, and to clarify arrangements and responsibilities.</td>
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<tr>
<td>6. After underway, make site visits early during the field experiences to follow up on planned activities and the status of relationship building as well as to adjust plans and placements, if such is needed.</td>
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<tr>
<td>7. Conduct a celebration and/or a recognition ceremony to acknowledge all participants for their contributions to the field-based, learning experiences of an EEP.</td>
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<tr>
<td>8. Strategize alternative experiences in case unforeseen events occur hindering ideal field placement plans, such as threats to biosecurity or constraints due to proprietary issues.</td>
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The EFs indicated overall positive impressions of follow up provided by Oklahoma State University team members during reciprocal visits to their countries and through electronic mail and telephone communication. However, some voiced interests in additional long-term facilitation, including ongoing mentoring at a distance. Leaders of EEPs are encouraged to seek funding to support such.

Other investigations intended to gain perspectives about the experiences of both mentors and protégés depending on the type of relational encounter could provide additional recommendations regarding training curricula and field experiences most appropriate for similar fellowship programs in the future. Moreover, longitudinal research about the implications of mentoring experiences may reveal strategies to consider in recruitment, selection, preparation, training, and support of participants in cross-cultural, fellowship programs featuring entrepreneurship education. Implementing such strategies may result in stronger and more productive collaborative relationships among a fellowship’s participants over time.

References


Strengthening Coordination Among Extension Service Providers for Improved Provision of Agricultural Extension and Advisory Services: A Case Study from Kenya

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Abstract

Implementation of decentralized and pluralistic policies in provision of extension services has led to increased availability of actors providing extension services to farmers in most developing countries including Kenya. What is unique about extension services providers is that they have a shared goal of improving agricultural productivity. However, in some cases these providers differ in their knowledge regarding the practices or knowledge that is required to improve agricultural productivity. Lack of shared knowledge among providers has contributed to delivery of uncoordinated and duplication of efforts thereby limiting the effectiveness of efforts in extension services delivery. Moreover, in some cases lack of shared knowledge has contributed towards provision of conflicting information which has left farmers confused. Enhancing coordination and collaboration among these representatives is of paramount importance if their efforts to improve agricultural productivity are to be successful. Having structures in place that bring together organizations that have shared goals is an important step in facilitating coordination. This is based on findings of a case study that was conducted in Kenya with the Kenyan Forum for Agricultural Advisory Services (KeFAAS). The results of the study provide insights that can be used as a starting point when strengthening coordination in extension services delivery in decentralized and pluralistic environments.

Keywords: coordination, improved productivity, shared goals, pluralism

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Introduction

Several sub-Saharan African countries including Kenya have been implementing various reforms aimed at improving delivery of agricultural extension services. The Kenyan Extension service delivery, has evolved over time starting when the government was the sole provider of extension services (Davis & Place, 2003) to the time when the provision of agricultural extension services has been commercialized (Poulton & Kanyinga, 2014). However, at present not only has delivery of extension been privatized, the Kenyan government is also implementing a pluralistic demand driven extension policy where farmers are expected to demand and pay for the services that they need (Ong'ayo, Onyango, & Ochola, 2016). The commercialization of extension service provision and the implementation of the pluralistic demand driven extension services has resulted in an increased number of stakeholders providing extension services including private extension service (Muyanga & Jayne, 2006). The implementation of the new system came with new and unique challenges. One such challenge, was the absence of a forum for communicating and connecting with all the farmers as well as coordination with other extension service providers in the country (National Agricultural Sector Extension Policy, 2012). In the past when the government was the sole provider of extension services the government, through the public extension service system, would have cascaded extension information and materials, funding, and other resources such as vehicles and equipment to all member counties. However, under the new system, communications and feedback is directed to each of the 47 counties through the council of governors. The new process has been identified as time consuming and limited to only the top leadership of the ministry can engage the council (Kenya Law Reform Commission, 2019).

The lack of a central coordinating agency has made it challenging to connect with farmers and extension service providers around the nation thereby contributing to a number of challenges such as low productivity and limited access to markets among the farmers (Boulanger, Dudu, Ferrari, Mainar Causapé, Balié, Battaglia, 2018). Similarly, disseminating technologies and innovations to farmers has also become more of a challenge particularly for those that are in more remote areas (Muyanga & Jayne, 2008). Although the devolved system is intended to make governance more efficient and locally relevant, one of the consequences is that there is not a central authority issuing policies related to local extension programming (Mwololo, Nzuma, Ritho, & Aseta, 2019).

The increased presence of private extension service providers has led to fewer extension agents in other areas. Private extension service providers tend to work and deploy their staff in more productive areas, thereby leaving small-scale subsistence farmers without access to extension services (Muyanga & Jayne, 2006). As such, there can be a disproportionate number of extension agents in certain areas based on the productivity of the area and the type of farmers, and resources, available. Moreover, in other cases, private extension service providers have been reported to promote expensive technologies thereby making it hard for resource poor farmers to adopt such technologies despite being promising in addressing farmers’ needs (Ong'ayo, et al., 2016). In response to these and other challenges, the Kenyan Forum for Agricultural Advisory Services (KeFAAS) was established to serve as the coordinating body for provision of agricultural extension and advisory services (AEAS). The implementation of the pluralistic demand driven extension and the decentralization policy in Kenya provides an interesting case to examine the role of extension networks, such as KeFAAS, in similar contexts.
Theoretical Framework

This study was guided by the relational coordination theory. Relational coordination is defined as “a mutually reinforcing process of interaction between communication and relationships carried out for the purpose of task integration” (Gittel, 2002, p. 301). The theory looks at coordination as being comprised of three attributes namely: *shared goals, shared knowledge*, and *mutual respect* (Gittel, 2012). Gittel (2011), further described the shared goals as being superior to functional goals of each player, while shared knowledge was described as the ability for the players to look at the relationships that exist between their specific functions and the contribution that constitutes the whole process. Lastly, mutual respect serves as the precursor for overcoming challenges or obstacles that may prevent individuals from appreciating and valuing the contributions of others. As such relational coordination is “measured as a network of communication and relationship ties among workgroups engaged in a common work process” (Gittell, Godfrey, & Thistlethwaite, 2013, p. 211).

Although relatively unexamined within an agricultural service provision, the theory has shown promise in related services contexts such as air travel and medical treatment (Gittel, 2011). For example, in nursing, relational coordination has been shown to be instrumental in mitigating challenges that are created due to differences in geographical proximity and levels of technological advancements (Otte-Trojel, Rundall, de Bont, & van de Klundert, 2017). Extension, as a service delivery enterprise, requires effective integration of interdependent tasks in order to ensure provision of services that are useful and meet the demands of the customer (Gittel, 2002). The presence of multiple service providers with varying levels of extension expertise necessitates the need for frequent and high-quality communication among the service providers and clientele through appropriate coordination structures (Chambers, 1997; Okorley, Gray & Reid, 2010; Pretty, 1995; Rolling, 1991). These needs must be buttressed by shared knowledge and goals as well as mutual respect to effectively address farmers’ needs (Gittel, 2011). Despite the importance of these antecedent conditions, coordination and collaboration in service delivery is a challenge facing many African countries, especially those in decentralized and pluralistic environments (Hanyani-Mlambo, 2002; Shiferaw et al., 2014).

Purpose and Research Questions

The purpose of this study was to examine the role that KeFAAS plays in coordinating agricultural extension service provision in Kenya with a particular focus on the processes and outcomes of the interventions that were implemented by KeFAAS in collaboration with one example organization, the Seed Savers Network (SSN). The study was guided by the following research questions: 1) What is the background of the KeFAAS network? 2) How did KeFAAS facilitate coordination in provision of extension and advisory services in Kenya? 3) What were the impacts of the collaboration efforts?

Methods

This study was part of a larger evaluation project focused on evaluating the impact of agricultural extension service delivery in Africa. Therefore, critical realism lens was used in order to understand the reasons behind successful implementation of KeFAAS efforts as well as provide practical policy recommendations for implementation and establishment of similar extension networks (Fletcher, 2017). Qualitative research methods were employed in order to capture experiences of the individuals who were involved in the establishment and implementation of KeFAAS activities from their point of view (Hammarberg, Kirkman, & de
A single instrument case was used in order to focus on the experiences of the individuals that were involved in the process of establishing and implementing the KeFAAS network. The case-based approach allowed for in-depth observation and analysis (Lacey, 2016).

Data were collected using focus groups, observations, and key informant interviews. A semi-structured interview guide was used for collecting data during key informant interviews and focus groups. The interview guide was based on structure and framework provided in the Framework for African Agricultural Productivity (FAAP) principles, framed within the larger Comprehensive African Agriculture Development Programme (CAADP) issued by the African Union’s New Partnership for African Development (NEPAD, 2015). The participants for the study included members of the Seed Savers Network (SSN) and members of KeFAAS including the network executive director, support staff, and advisory council members. SSN is an extension service organization that was identified by KeFAAS as an exemplar of coordination between KeFAAS and other extension organizations.

The SSN is a non-profit grassroots farmers’ organization that promotes seed access. The vision for the network is to be a lead agent in promoting diverse seed access to farming communities in Kenya. Their mission is to conserve agro-biodiversity by strengthening communities’ seed systems for improved seed access and enhanced food sovereignty by reaching out to all the farmers in Kenya, although they are geographically located in a small area within the Rift Valley. Three members of SSN were recruited for the study and participated in a focus group. A field visit was conducted at the SSN facility. The field visit included a tour of the facility provided by the SSN director, as well as discussions with two additional SSN members. The tour included the SSN seed storage facility, a review of the SSN literature that has been produced, the trial gardens where different variety of plants are grown for demonstration purposes, as well as novel planting demonstrations including a vertical garden model, composting structures, and seedling growing conditions. The focus group was conducted after the facility tour. The focus group lasted approximately one hour and allowed participants to respond to questions, as well as elaborate on themes between participants.

In addition to the SSN focus group, a total of three additional key informant interviews were conducted. The interviews were conducted with the KeFAAS director, the KeFAAS communications officer, the KeFAAS board chairperson. The interviews lasted between 30 minutes and one-hour. Additionally, a second focus group was also conducted with the KeFAAS director, board chairperson, and two other board members. The second focus group lasted approximately one-hour and was based on the same moderator’s guide. However, participants were allowed to expand upon themes and interact directly with each other as well.

All the key informant interviews and focus groups were conducted in English. All the data from focus groups and interviews were transcribed. The data from the field notes, focus groups and key informant interviews were analyzed in order to generate themes and sub themes that informed the results of the study. The themes and subthemes were generated following the elements of relational theory. Therefore, three major themes focusing on how KeFAAS identified stakeholders who had shared goals were identified. Moreover, themes that emphasized KeFAAS’ efforts in establishing and identifying opportunities for enhancing shared knowledge and respect were generated. Member checking of the transcribed data was conducted to ensure that the data was representative of the interviews and focus groups.

Subjectivity statement

As qualitative researchers, the authors wish to recognize the bias that may exist from the
primary researcher’s previous experience working in similar settings, and its contribution towards the data analysis and interpretation process. The authors wish to acknowledge that the primary researcher was conducting an evaluation of the continental African Forum for Agricultural Advisory Services (AFAAS) network as part of a larger study during the time that this data was collected. Furthermore, the primary researcher has previous experience working with extension networks in over 50 countries from all six permanently inhabited continents.

Results

Background of KeFAAS

During the interviews and focus groups, one major theme that emerged was regarding identification of stakeholders with shared goals. From the interviews and focus groups it was reported the KeFAAS network was established in 2016 to address the need for a central coordinating structure due to the implementation of the pluralistic demand driven extension services provision in Kenya. In particular it was reported that KeFAAS focuses on providing coordination and consultative support and frameworks to improve the provision of extension services in Kenya. An emergent theme from the process was the consistent agreement amongst study participants the primary goal of KeFAAS is to address coordination issues in extension provision. However, it was also reported that having a shared goal was not enough as KeFAAS had to overcome a number of challenges in order to become a formally recognized entity in the country. The challenges included: gaining policy maker recognition, coordinating with the appropriate stakeholders, and securing funding. As a registered entity, KeFAAS initiated several activities to increase awareness of the organization, including articulating the need for the network as well as recruiting new members. An elaboration on the emergent thematic actions are provided in greater detail.

Communication and Marketing Materials

In order to ensure that the public and other stakeholders were aware of KeFAAS in terms of its objective, mission, vision and structure, the network developed and disseminated various communication and marketing materials. These materials contained information about the value and purpose of KeFAAS. Additionally, these materials included information regarding mode of conduct, expectations of members, and the role of the network. Information was provided to ensure that potential members fully understood their role as well as the role of KeFAAS and its expectations. These disclosures were provided to address some challenges that the network was already facing. For example, many potential members were already paying members of similar groups that provided little to no value, these potential members were not sure about the role and value of KeFAAS.

National Agricultural Trade Fair Participation

Throughout Kenya fairs provide an opportunity for farmers, private industry, and other associated organisations to connect and network. Therefore, KeFAAS took advantage of these fairs to connect with farmers and other stakeholders. Having a physical presence at fairs gave KeFAAS an opportunity to meet face-to-face with potential members. For example, through participation at the national agricultural show in Nakuru county the KeFAAS leadership team connected with members from the SSN.
Training and Capacity Building Activities for Members

In addition to their communication and outreach efforts KeFAAS conducted a number of training and capacity building for its members. For example, KeFAAS delivered seven trainings for members, and potential members, on AFAAS extension focused curriculum. The trainings served a dual opportunity for KeFAAS to strengthen capacity of the agricultural industry in Kenya, but also to increase awareness for the network through shared knowledge.

Impacts of KeFAAS Actions

Several impacts were reported as a result of KeFAAS efforts in reaching out and coordinating with various stakeholders in the agricultural sector. The combination of communication and marketing materials and presence of KeFAAS at the National Agricultural Fair resulted in creating positive connection which made it easy for KeFAAS to identify organizations with shared knowledge. Additionally, efforts directed at providing communication materials to everyone ensured anyone interested was able to gain knowledge about the organization, whether there was shared knowledge or not. One such connection was with the SSN which resulted in the SSN registering for membership with KeFAAS. Through awareness building and validation meetings the SSN was able to visualize the benefits of joining KeFAAS as well as the overlap in shared goals between the organizations. The SSN recognized the national reach of KeFAAS and how their network would enable them to extend the impact of their information and resources much more efficiently and effectively. Additionally, SSN viewed KeFAAS as a knowledge facilitator within Kenya with legitimacy and respect that might benefit their efforts.

In terms of mutual respect, this was evidenced through SSN’s connections with KeFAAS, specifically, the SSN was able to secure funding, initiate, and implement a project to catalogue local seed varieties. Recognizing the reciprocal, and mutually respectful and beneficial relationship with SSN, KeFAAS implemented a project to document indigenous crops that were grown in a limited number of counties and to then work with one university (both an SSN and KeFAAS member), to analyse the nutritional content of the crops, to then better educate farmers on those suited for different agro-ecological zones and have high nutritional content. KeFAAS, provided technical guidance and financial assistance for completion of the project which led to completion of about 1000 questionnaires and collection of seed samples in two counties. As one representative for SSN said, “we would not have completed this project were it not for KeFAAS.” Through this collaboration, several stakeholders involved with the SSN project subsequently opted to become members of KeFAAS themselves.

Conclusions, Implications, and Recommendations

KeFAAS efforts in connecting with other stakeholders to coordinate delivery of AESA in Kenya appear to be succeeding. A primary theme that emerged from the analysis is that part of the success may be attributed to KeFAAS’ emphasis on ensuring potential members had adequate information about the role of KeFAAS as well as its value. KeFAAS was very intentional in ensuring that information provided through their communication and marketing materials focused on shared knowledge, goals, and mutual respect for membership (Gittell, 2011). To ensure that the members had shared knowledge, the network was willing to work with SSN on a project that the organization was implementing. Instead of KeFAAS dictating how to complete the project KeFAAS provided supplementary support, bringing their connections,
resources, and expertise to bear. In a mutually beneficial manner, both KeFAAS and SSN had shared goals as both were looking for ways to reach more stakeholders country.

A recommendation is for extension networks to ensure that knowledge is shared broadly and consistently amongst members and affiliated organizations. Serving as a knowledge facilitator and promoting awareness of projects and programs should help improve message consistency and mitigate the potential for conflicting information to farmers (Chowa, Garforth, & Cardey, 2013). These recommendations are consistent with those posited by the Theory of Diffusion of Innovations (Rogers, 2003). Furthermore, there is need to come up with advisory councils that include representatives of scientists, farmers and extension service providers. A committee comprised of individuals representing diverse areas of expertise will help to ensure shared knowledge is appropriately vetted. Based on recommendations within the literature a further recommendation would be to codify and make information and knowledge available in platforms that are appropriate for their stakeholders, “To improve knowledge management effectiveness RAS [extension] networks should establish a dedicated platform that is appropriate for their membership and context” (Lamm, Lamm, Davis, & Swaroop, 2017, p. 103).

A noteworthy limitation for the study is the focus on one case for examination. Although not intended to be generalizable, the results should be considered within context of the breadth of the analysis. Nevertheless, it is worth noting that several scholars have emphasized the need for creation of coordinating structures in order to strengthen coordination in extension service delivery (Chambers, 1997; Okorley, Gray, & Reid, 2010; Pretty, 2003; Rolling, 1991). However, the literature remains sparse related to the practical aspects of how this coordination can be achieved. Therefore, this study provides insights as to how coordination in extension delivery was achieved by the KeFAAS network. An associated recommendation is for more research to occur within extension networks to replicate the observations of the present study. In particular, a deeper and more rigorous analysis of shared goals, shared knowledge and mutual respect should be examined further to determine their impact in enhancing extension coordination.

References


Social Media Application in Agriculture Extension Programming for Small Scale Rural Farmers: Is Knowledge Impeding the Lack of Adoption?

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Abstract
The purpose of this study was to assess the knowledge level of farmers on basic computer literacy, social media use, and to explore which social and demographic factors affected their knowledge capacity. The study had a final sample of 176 participants from the northern, southern and central regions of Trinidad and Tobago. A survey instrument comprising of 14 multiple-choice questions with one accurate response was developed to decrease bias of farmers randomly selecting the accurate response. The questions addressed knowledge on basic computer and social media literacy. Analysis was conducted using one-way ANOVA with post-hoc testing. Results indicated that there were significant differences in farmers’ performance in the knowledge test based on characteristics such as age, education, and household use of social media and the internet. Based on the findings, minimal training in computer and social media literacy did not impede the farmers’ use of the computer or social media. These discoveries highlight the potential of extension programs using the internet and social media applications to improve communication efficiency among agricultural stakeholders within farming communities.

Keywords: agriculture, computer literacy, Extension, knowledge, social media
Introduction

The global access to information amongst rural agricultural communities has increased significantly in the past 15 years. It is estimated that mobile phone access has infiltrated over 90% of rural communities globally with the most recent 1 billion connections predominantly occurring in some of the poorest socio-economic groups (Food and Agriculture Organization [FAO], 2015). Such changes in technological penetration have resulted in the emergence of several initiatives that fuse Information Communication Technologies (ICTs) with agriculture extension programming. Programs such as e-Agriculture itemized in the plan of action at the World Summit on the Information Society in Geneva (2003) and Tunis (2005) and the diffusion of mobile applications such as AgriApp available through the Google Play Store are now integral tools used in agricultural and rural development planning and policies globally.

Despite the expanse in technological access globally, many agricultural communities in rural areas are still subject to the digital divide for several socio-economic, geographic, cultural and demographic reasons (Chinn & Fairlie, 2007; Roberts, Beel, Phillip, & Townsend, 2017; Rotz et al., 2019; Salemink, Strijker, & Bosworth, 2017). The premise behind ICT based agriculture programs is that increasing access to information technology should enhance knowledge through an improvement of communication efficiency, leading to an improvement in public sector engagement and a modernization of traditional practices to boost productivity (Adenle, Wedig, & Azadi, 2019; Steinmuller, 2001). Even with global efforts by governments, non-governmental organizations [NGOs], the FAO, extension practitioners, and the global reach of technologies, many small-scale farmer holdings especially in rural communities have limited access to ICT based agriculture programs primarily caused by an absence of facilitation or underutilization of the available technological resources (FAO, 2012).

A study conducted amongst rural farmers in Tamil Nadu, India showed that farmers primarily sourced information from newspapers and television broadcasts despite having access to mobile technology with broadband (Babu, Glendenning, Asenso – Okyere, & Govindarajan, 2012). The farmers did not utilize the internet or mobile technology for accessing information related to their production system. An ICT intervention in extension programming especially for small scale farmers in rural communities needs to infuse the technologies with the culture and social networks existing in that community. For example, the Digital Green Project in India observed an increase in adoption practices of six to seven times over the traditional extension to farmer interface because the ICT intervention was designed as a tool to expand and deepen the connections within the social network of the rural farming communities visited (Gandi, 2007). Visualizing farmers’ social networks equips policy makers and programmers in identifying key social relationships within communities that can be strategically used to increase farmer capacity for knowledge sharing and networking (Shikuku, 2019; Thuo et al., 2013).

With the rapid emergence of mobile applications, a new platform for extension programming on social media now provides the opportunities for farmers to enhance the social networks within their communities and to even extend the reach of these communities. Using social media applications such as Facebook, Twitter, Instagram and Pinterest allows for a pluralistic interface between stakeholders along the agriculture value chain (Garcia, Dev, McGinnis, & Thomas, 2018). More farmers especially large scale operators from developed countries are actively engaging in social media platforms such as YouTube for educational purposes with an estimated 44% of farmers using it for learning materials (Walter, 2016). With the philosophy of social media in strengthening the connections between people, social media applications are now an intricate tool in many business models (Barnes & Barnes, 2009; Yao,
Shanoyan, Peterson, Boyer, & Baker, 2019). Many extension professionals in developed countries are now using social media applications to reach and remain relevant with their clientele (Gharis, Bardon, Evans, Hubbard, & Taylor, 2014; Rotz et al., 2019). For instance, extension officers using weblogs to disseminate information to stakeholders in the turf grass industry in the United States (Jones, Kaminski, Christians, & Hoffmann, 2011) and the University of Minnesota Equine Extension Program and Michigan State University Online Horse Management program developed interactive communication streams to horse breeders using Facebook (Martinson, Skelly, & Fisher, 2011). In Sri Lanka, extension agencies adopted ICT technology stewardship models using messenger platforms such as What’s App to promote knowledge sharing amongst farming communities (Jayathilake, Jayasinghe-Mudalige, Perrera, Gow, & Waidyanatha, 2017).

Several studies have highlighted the possibilities and potential benefits of social media applications incorporated in extension programming. Gharis, Bardon, Evans, Hubbard, and Taylor (2014) described social media as a cost-effective tool, in most cases only costing the broadband services fee within the country, that can provide real time information in a timely manner from anywhere in the world. Kante, Oboko, and Chepken (2019) asserted that ICT and social media tools assist users to learn and share agriculture information keeping abreast of the latest innovations and technologies in the sector. Morrone (2017) stated that social media applications in extension are a rapidly growing field that can enhance group interaction and strengthen participatory linkages.

Despite the successes and benefits outlined in the literature, there are many barriers affecting social media use in extension programming in many countries with large rural farming populations even with expanding technological and broadband infrastructure (Awan, Ahmed, & Hashim, 2019; Lwoga & Chigona, 2019; Saravanan, 2010). There are many studies that demonstrate the application of social media in extension programming (Barau & Afrad, 2018; Jayathilake et al., 2017; Thomas & Laseinde, 2015; Zipper, 2018) but very few studies that empirically establish the inhibiting factors that prevents the prevalent use of social media in extension programming especially amongst small scale rural farmers (Beza et al., 2018; Newbury, Humphreys, & Fuess, 2014). Some studies have attributed that the lack of ICT adoption such as the internet and social media in extension programming for small scale rural farming communities is due to a lack of education and training in ICTs and low computer literacy levels amongst farmers (e.g. Aldosari, Al Shunaifi, Ullah, Muddassir, & Noor, 2017; Mwalupaso, Wang, Alavo, & Tian, 2019; Medhi –Thies, Ferrera, Gupta, O’Neill, & Cutrell, 2004; Rahaman, Barau, & Norman, 2019; Rege & Nagakar 2010; Smith, Morrison-Paul, Goe, & Kenney, 2004). This preliminary study will explore the basic knowledge, training and use of computers, the internet and social media within a specific community of practice, in this case, small-scale vegetable farmers in the rural communities of the Caribbean island of Trinidad and Tobago to determine if the lack of training and knowledge levels are the potential reasons for the lack of adoption.

Theoretical Framework and Review of Literature

ICT adoption in rural farming communities are constrained by complex and interconnected barriers at the domestic, regional and international levels influenced by socio-cultural and environmental factors with the lack of knowledge and attitude being the key inhibitors (Aldosari et al., 2017, Imran, 2009; Lwoga & Chigona, 2019). In the diffusion of innovation theory, knowledge and several socio economic characteristics such as family structure
and community groups are a key characteristic of the persuasion stage in the adoption process hence a knowledge based community influences a constructive attitude towards ICT innovations (Rogers, 1995). According to Bloom’s taxonomy of cognitive learning, knowledge is the embodiment of information that a person possesses in a subject matter and this information comes from a combination of formal education training and life experiences (Alexander & Jetton, 2000). Bourdieu (1977) postulated the theory of practice which stated that a social life is a constant struggle to construct using the cultural resources and social experiences of individuals. Through this socialization dilemma within the social construct of the community, individuals will be predisposed to act a certain way.

All these theories essentially address the perspective that knowledge or a lack of knowledge is not a sole contributor impacting a technological adoption and that the adoption process is influenced by the social networking experiences of individuals sharing their knowledge. Theoretically, this disposition shifts from the conventional idea that lack of knowledge of ICTs such as the internet and social media causes a lack of adoption. If the social environment allows for knowledge sharing, then the adoption process may not be impacted by the lack of knowledge but rather a lack of culturing the technology within the community of practice.

Research conducted by Strong, Ganpat, Harder, Irby, and Linder (2014) concluded that extension officers in the Caribbean use ICT technologies including social media for personal use but revert to traditional methods when engaging farmers, even though their findings suggested that ICTs increases the productivity of extension officers. Mendoza (2016) highlighted that farmers’ livelihoods tend to depend on a range of inputs and factors with regards to pest management, farming practices from sowing to harvesting, and the willingness of the consumers to purchase produce at quality prices. However, many of the mechanisms used to attain these outlets have remained static through old-fashioned avenues such as spoken communication, informal settings in the field or with resident organizations. Mendoza (2016) outlined the perspective of the founder and chief executive of 8 Villages, Sanny Gaddafi, who operates a rural marketing system to corporate clients using ICTs. Gaddafi’s perspective is that farmers are disinclined to the possibility of accepting modern technologies which results in the delay of application. Gaddafi goes further to state that in his experience, 75% of farmers are resistant to the use of technology as a means of enhancing their farming prospects. Smith, Morrison-Paul, Goe, and Kenney, (2004) asserted that adoption of computers and the internet amongst farmers depends on their exposure to the technology through training, employment experience outside of farming, age, influence from their friends, family, and other peers. Kante, Oboko, and Chepken (2019) shared a similar perspective to Smith et al. (2004) that people in a community interact due to common interests as such the nature of interaction of farmers in their community is a major key to successfully implementing ICT technology. Shikuku (2019) conducted a study on agriculture technology adoption in Uganda and concluded that the social distance shapes the diffusion of agricultural knowledge and social learning can address the informational constraints in the adoption of agriculture technology.

Medhi-Thies, Ferrera, Gupta, O’Neill, and Cutrell (2014), whose research was conducted with a low-literate rural farming community in India, outlined other hindrances to the application of technology and social networking systems. Digital literacy, the cost of devices, network activities, and location as well as the cultural and social environment also contribute to the low applicability of social networking systems. Despite the decrease in the cost of mobile devices and connectivity, android operating systems proficiency in running non-textual apps functional
for low-literate communities are still difficult for low-income people to attain. In order to bridge the gap between digital literacy and application of social networking systems, there needs to be support given by personnel who are more digitally literate, and who use social networks for social links, collective characteristics, content, exploration, surfing and status updating (Medhi-Thies et al., 2014). This process provides motivation and with continuous support can change the perception and use of social networking systems overtime. Disseminating information and expertise within the targeted community in which people acquire knowledge within their social network, can create an opportunity to progress personally and professionally and therefore change the social norm of adoption (Lave & Wenger, 1991). In essence, cultivating a technological practice within a community should be done by knowledge sharing mechanisms that clearly shows the incentives in adopting through formal and non-formal learning platforms. This study proposes that the lack of knowledge and training is not the limiting factor to the lack of adoption and that many small scale rural farmers have at least a basic working knowledge of computers, the internet, and social media influenced by their social environment.

Purpose & Objectives

The purpose of this study was to identify the knowledge levels and influencing factors of small scale vegetable farmers across several rural communities in the country of Trinidad and Tobago on the rudimentary principles of using a computer, the internet, and social media by measuring their performance in a basic computer and social media literacy test. The specific study objectives were:

1. To outline the basic knowledge levels on the use and applicability of computers and social media amongst small scale vegetable farmers from rural communities within the island state of Trinidad and Tobago.

2. To compare the performances between these farmers in a basic knowledge test based on their age, educational background, and household use of computers and social media.

Methodology

Prior studies on knowledge levels of a population have used a varied set of approaches with mixed results. Capturing knowledge is challenging with most researchers resorting to a format that encourages the participant to self-report his or her knowledge level on a given topic within a specified domain (Mautone & Mayer, 2001). This maybe a convenient and cost-effective method of measuring knowledge, but researchers have argued that this approach is more a measure of perception or confidence in a subject matter rather than an observable or indexed measure of knowledge (Lawless, Kulikowich & Smith, 2002). As such, the survey instrument designed for this study used an examination format like that of the formal education system.

A questionnaire consisting of 14 multiple choice questions was administered to the sample population. A four-response multiple choice format with one correct response was adopted to minimize the bias to a one in four chances of the respondent randomly choosing the correct answer, unlike formats that adopt a true or false method which has a one in two chances of a respondent randomly choosing the correct answer. The questions were adapted by the researchers from established computer and social media literacy testing sites and articles (see Ashley, Maksl & Craft, 2013; Criteria Corporation, 2015, Computer Literacy and Internet Knowledge Test; The Job Network, 2015, Computer Literary 101; Seneta, 2015) specifically to assess the knowledge on basic computer functions such as turning on and off a computer,
common computer symbols, the function of computer hardware and software such as the keyboard and Microsoft Office, sending emails and email attachments, the function of various social media sites, and recognizing various social media logos. For example the respondents were asked how do they properly turn-off a computer and were given the options of either, 1) pressing the power button on the computer and monitor, 2) by closing all window screens on the computer and it will eventually shut down, 3) pressing ALT+CTRL+DELETE and clicking log off or 4) going to the Start Menu and pressing Shutdown. For an example related to social media use, respondents were asked which of the social media site is mainly used to stream and watch videos and were given the options of either, 1) YouTube, 2) Instagram, 3) Twitter or 4) What’s App. These questions covered a basic working knowledge of computers and social media use and therefore can be assessed as a basic measure of computer and social media literacy. It was critical that the researchers developed an instrument to assess the basic levels as unraveling the issue of knowledge must start at the most fundamental level according to Bloom’s Taxonomy (Krathwohl, 2002).

The questionnaire captured information about prior computer training, computer use, internet use, and social media use by farmers and their respective households and other demographic information such as age, education levels, and household size. These variables were identified as key points of comparison since the theories and literature on knowledge and computer literacy outlined them as influential (e.g. Hsu, Hou, Chang, & Yen, 2009; Smith et al., 2004). Two pretests were conducted after the preliminary questionnaire was developed. The pretests were conducted to ensure that the questions stated were clearly understood by respondents and there was no ambiguity between the correct response and the incorrect responses in the multiple-choice questions. The pretests were conducted initially with 10 students at a tertiary institution and then 10 farmers from a rural farming community. The student pretest was conducted first to clarify any ambiguities within the multiple-choice responses. This group was identified for the pretest given their familiarity with the multiple choices testing format. Once the necessary adjustments were made after the first pretest, the second pretest was conducted to ensure that the sample population correctly interpreted the questions asked. After the pretests and necessary adjustments were made, the final questionnaire was administered to six rural farming communities across Trinidad and Tobago in March 2015.

From a list of rural farming communities identified by the Agricultural Society of Trinidad and Tobago, two farming communities were randomly chosen from the northern, central, and southern regions of the country. Across these six communities, the researchers targeted a sample of 300 farmers. This sampling framework used for Trinidad and Tobago was similar to one used in the study done by Roberts, Ganpat, Narine, Heinert, and Rodriguez (2015) and was deemed as acceptable in that study. The researchers used a transect walk within each community. The farmers were given the option to answer the questionnaire on their own merit or be interviewed by an administrator. The collected questionnaires were screened and collated to ensure consistency in responses. Several farmers did not complete the multiple-choice test adequately, so their responses were omitted from the data set. Only the questionnaires from farmers who attempted to answer all questions were included in the data set in order to reduce any non-response errors within the dataset. In order to minimize on the possibility of non-response errors further, each farmer was asked to consent to participating, were guaranteed confidentiality upon participation and were encouraged to attempt to answer the questionnaire to the best of their ability. The administrators’ role was to clarify any ambiguities the farmers had with any question. Administrators gave the farmers the option to either complete the survey
themselves or to be interviewed by the administrator and have their responses recorded. If farmers chose to be interviewed, the administrators were under a strict protocol to adhere to the questions asked in the survey without deviating from its terminology that would change the structure of the question. After the six transect walks were completed, a total of 207 farmers were surveyed. The farmers in the community indicated that several farmers were not in their fields at the time of the transect walks because they were engaged in market activities.

In terms of response rates, 61 farmers chose to be interviewed and 146 farmers completed the survey on their own. There were 61 complete responses by farmers who chose to be interviewed by an administrator and 105 completed surveys (41 incomplete surveys). Surveys were omitted based on the criteria of attempting to answer all questions. Individuals that did not provide an answer to a question were omitted from the final dataset because the researchers could not establish empirically if the non-response was due to the lack of knowledge, if the respondent genuinely missed the question or if they did not have time to complete the questionnaire properly. With the number of participating farmers from the six transect walks and the number of inadequate questionnaires omitted from the data set, the study had a final sample size of 176 completed survey which was 59% of the initial target of 300.

The data were analyzed using a combination of descriptive statistics and mean comparison testing. Frequency counts were used to tabulate the extent of computer, internet and social media use by the farmers and their households. For the samples’ performance in the multiple-choice test, a percentage of correct responses were tallied. The average percentages received were tabulated across the entire sample. Comparisons were then made in the performances of the farmers based on their age, education level, household size, and household use of the internet and social media. These comparisons were analyzed using one-way Analysis of Variance testing (ANOVA). To determine in which of the subcategories the differences were occurring, ANOVA models with more than two subcategories required a post hoc test. The post hoc test compares the mean difference of each subcategory at 5% significance. The Tukey HSD, Dunnett T3 and Bonferroni post hoc tests were implemented to assess where the mean differences were occurring. The models were assessed for equal variances using Levine’s test of Equality in Variances.

Findings

Computer Training and Social Media Use

The questionnaire itemized the farmers’ exposure to computer training, contact with extension support for computer use, the extent of computer and social media use by farmers and farmer households and the extent for which computers and social media are used for agriculture related activities. These variables were identified as important markers of computer literacy and by extension social media use according to the literature (e.g. Hsu, Hou, Chang, & Yen 2009). The items were represented as either a binary variable or on a four-point Likert scale. Questions related to computer training and extension support with computers were coded as a binary variable and questions relating to computer use, internet use and social media use by farmers and farmer households were coded on a four-point scale with 4 representing high frequency of use and 1 representing low frequency of use.

A frequency count was applied to highlight the key markers of knowledge based on computer literacy within the sample and the amount of exposure to online activities that the farmers’ face daily. The results showed that 38.7% of farmers sampled received some form of
computer training prior with 9.6% indicating that training was provided by extension services. Despite the percentage of farmers receiving computer training, 52.6% indicated that they used the computer frequently with 47.4% and 34.7% indicating frequent use of the internet and social media respectively. In relation to computer and internet use for agriculture, the results showed that 35.3% use the internet for agriculture purposes with 15.6% using social media for agriculture purposes. Household use showed a different trend in comparison to farmer use whereby 74.0% of the farmers indicated that their household use the internet more than one hour daily and 70.3% indicated that their households frequently use social media.

The variables observed in the data correspond with the findings of Smith et al., (2004) which highlights that training and constant exposure from the surrounding environments has an impact on knowledge. Even though farmer use of social media was significantly low, the household use was notable. The following sections will identify what are the subsequent effects of their use, training, exposure and other demographic factors on the farmers’ performance in a basic computer and social media literacy test.

Demographic, Social and External Influences on Test Performance

The differences in performances were compared against the farmers’ age group, farmers’ education level, family size and household use of computers and social media. All these variables showed significant results when comparisons were made with the farmers’ performance in the knowledge test.

According to Table 1, there was a statistical difference at 1% significance between the average score received in the knowledge test and the farmers’ age range ($F = 19.727; p = 0.00$). The Levine’s test of equal variance indicated that the subcategories had at least one with a different variance. ANOVA tests used to compare mean differences can still be interpreted if the subcategories have different variances but to determine where these differences occur required a post hoc test such as the Dunnett T3 test which assumes unequal variance in the ANOVA model. The results of the Dunnett T3 post hoc tests showed a statistical difference at 1% significance in the average score received in the knowledge test for farmers within the 18 – 25 and 46 – 60 (Mean Difference = 28.49); 18 – 25 and 61 and over (Mean Difference = 55.28); 26 – 35 and 46 – 60 (Mean Difference = 19.08); and, 26 – 35 and 61 and over (Mean Difference = 45.87) age ranges. A statistical difference at 5% significance in the average score received in the knowledge test were observed between the 18 – 25 and 36 – 45 (Mean Difference = 18.25) age ranges. A statistical difference at 10% significance in the average score received in the knowledge test were observed between the 36 – 45 and 46 - 60 (Mean Difference = 10.24) age ranges. Additional model diagnostics was conducted with the Bonferroni post hoc analysis which yielded similar significant findings as the Dunnet T3. Therefore, comparing the mean scores from Table 1 shows an inverse relationship between age and the test performance. The younger farmers in the sample consistently performed better in the knowledge test when compared to the older farmers.

Table 1

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Subcategories</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>Partial Eta Sq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age Grouping</td>
<td>18-25</td>
<td>18</td>
<td>84.92</td>
<td>13.39</td>
<td>0.267</td>
</tr>
<tr>
<td></td>
<td>26-35</td>
<td>21</td>
<td>75.51</td>
<td>15.74</td>
<td>0.214</td>
</tr>
<tr>
<td></td>
<td>36-45</td>
<td>54</td>
<td>66.68</td>
<td>22.46</td>
<td>0.201</td>
</tr>
</tbody>
</table>
According to Table 2, there was a statistical difference at 1% significance between the average score received in the knowledge test and the farmers’ education level \( (F = 14.596; p = 0.00) \) despite the distinct difference in the size of each subcategory. According to Keppel (1993), unequal sample sizes may affect the homogeneity of variance assumption but as an ANOVA test for comparing means, the resulting comparisons can hold. The Levine’s test of equal variance indicated that the subcategories had at least one with a different variance. The results of the Dunnett T3 and Bonferroni post hoc tests showed that there was a statistical difference at 1% significance between all the education groups. Therefore, the higher educational level the farmer achieved, the better their performance in the knowledge test.

Table 2  
Difference in Test Performances Based on Farmers’ Education Levels  

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Subcategories</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>Partial Eta Sq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>Primary</td>
<td>26</td>
<td>45.61</td>
<td>29.84</td>
<td>0.130</td>
</tr>
<tr>
<td></td>
<td>Secondary</td>
<td>108</td>
<td>59.85</td>
<td>23.94</td>
<td>0.078</td>
</tr>
<tr>
<td></td>
<td>Tertiary</td>
<td>25</td>
<td>81.14</td>
<td>13.81</td>
<td>0(^a)</td>
</tr>
</tbody>
</table>

\( F = 14.596; p = 0.00; \text{ Model Effect Size} = 0.21 \)

Note. 0\(^a\) = effect size reference group.

According to Table 3, there was a statistical difference at 1% significance between the average score received in the knowledge test and the farmers’ family size \( (F = 4.216; p = 0.007) \). The Levine’s test of equal variance indicated that the subcategories had at least one with a different variance. Observing the sequence of the means for each subcategory in Table 3, there seem to be a random relationship between family size and test performance. The results of the Dunnett T3 and Bonferroni post hoc tests showed that there was a statistical difference at 5% significance only between the subcategory of farmers with a household of four persons and over five persons. There were no statistical differences in the means between the other subgroups. The post hoc tests do not provide sufficient evidence to conclude that family size has any implications on the farmers’ basic knowledge, but Table 3 also shows that the farmers’ with more than five members in their household performed the best in the basic knowledge test on average.

Table 3  
Difference in Test Performances Based on Farmers’ Family Size  

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Subcategories</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>Partial Eta Sq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Size</td>
<td>Up to 2 Members</td>
<td>49</td>
<td>56.12</td>
<td>30.13</td>
<td>0.031</td>
</tr>
<tr>
<td></td>
<td>3 Members</td>
<td>48</td>
<td>68.01</td>
<td>25.13</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>4 Members</td>
<td>33</td>
<td>52.60</td>
<td>23.68</td>
<td>0.041</td>
</tr>
</tbody>
</table>
According to Table 4, there was a statistical difference at 1% significance between the average score received in the knowledge test and internet and social media use in the farmers’ household \( (F = 12.136; p = 0.000; \text{Model Effect Size} = 0.363) \). The Levine’s test for equality indicated that the subcategories for the variable internet use at home all had equal variances. In this case, ANOVA models with equal variances require a different post hoc test. The Tukey HSD post hoc test was then implemented to determine which subcategories the mean differences were occurring. The post hoc test revealed that households that have no internet use significantly scored lower than households that use the internet regardless of the frequency. The post hoc test could not infer a statistical mean difference between the houses that use the internet rarely and regularly. For the variable on social media use at home, the Levine’s test indicated that there was at least one subcategory with an unequal variance. The Dunnett T3 and Bonferroni post hoc tests revealed that there was a statistical difference at 1% significance with the mean scores between the subcategories of farmers who indicated their households never use social media and the households that use social media very often. Both ANOVA tests indicate that the frequency of internet and social media use in the households has some impact on the farmers’ performance in a basic knowledge test of computers and social media.

Table 4

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Subcategories</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Partial Eta Sq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet Use</td>
<td>Never</td>
<td>27</td>
<td>38.98</td>
<td>27.62</td>
<td>0.317</td>
</tr>
<tr>
<td></td>
<td>Rarely</td>
<td>18</td>
<td>58.73</td>
<td>25.05</td>
<td>0.023</td>
</tr>
<tr>
<td></td>
<td>Often</td>
<td>54</td>
<td>61.64</td>
<td>24.44</td>
<td>0.017</td>
</tr>
<tr>
<td></td>
<td>Very Often</td>
<td>74</td>
<td>71.04</td>
<td>21.51</td>
<td>0(^a)</td>
</tr>
</tbody>
</table>

\( F = 12.136; p = 0.000; \text{Model Effect Size} = 0.363 \)

| Social Media Use     | Never         | 38  | 50.19| 31.79| 0.220           |
|                      | Rarely        | 13  | 53.85| 25.86| 0.018           |
|                      | Often         | 52  | 61.26| 23.85| 0.003           |
|                      | Very Often    | 69  | 69.98| 21.52| 0\(^a\)         |

\( F = 5.592; p = 0.001; \text{Model Effect Size} = 0.271 \)

**Conclusions, Recommendations, and Implications**

Despite minimal formal training in computer literacy and prior assumptions in the literature of farmers’ minimal literacy in computers and social media (Medhi-Thies et al., 2014), the use of the ICT technology was not impeded due to a lack of knowledge. The farmers’ household use of the internet and social media was notable even though the farmers usage themselves vary and their usage for agricultural purposes was low. This coincides with the theoretical perspective that farmers are hesitant to using computer and computer systems as they prefer the traditional practices to enhance their farming commerce (Gaddafi, 2016). According to Smith et al. (2004), age, education and family are some of the factors that influence the exposure
and adoption of technology. The findings of this study supports the perspective of Smith et al., (2004), as the results of the knowledge test highlight the significance of these factors.

The overall performance of the farmers in the knowledge test was moderate but clear distinctions were observed in the performance of younger farmers around the ages of 18 - 35 compared to the farmers over 50. An inverse relationship was also observed with regards to farmers’ performance in the knowledge test and their education level. With respect to family influence, the number of family members in the household did not seem to have an effect on farmers’ knowledge, however households’ use of the internet and social media had a direct relationship with the farmers’ performance on the test. Indication of frequent use of the internet and social media by farmers at a household level showed a significantly higher performance in the knowledge test compared to farmers who indicated minimal use of internet and social media at a household level. These findings suggest that computer and social media knowledge is inclined by the social life and experiences of farmers which align with the theoretical perspective of Bourdieu (1997) and the theory of practice.

Despite the moderate overall performance of farmers, the results of the study highlights that the farmers have a basic working knowledge of computers and social media especially the younger and educated farmers. The issue of adoption of ICT technology in Trinidad and Tobago does not appear to be a challenge associated with the knowledge of farmers. Further research is needed to assess farmers’ applied knowledge of social media and computers as well as to determine the social networking systems that affect farmer attitudes and behavior within their community of practice. This study can serve as a baseline assessment to serve a wider discourse into understanding why the underutilization of the internet and social media in rural small scale farming extension, but there is still room for improving its quality. Ideally, there is a lot more needed in measuring reliability and validity. The literature searches for this study did not reveal any studies testing farmers’ computer and social media literacy in a format where convergent validity and construct validity testing was possible. More importantly, the commitment of farmers answering the question can be challenging with farm gate interviews due to the farmers’ work schedule. Thus, longer questionnaires which can provide insights for reliability testing was a limiting factor for this initial study. Further work is also needed with larger samples, more communities and larger farming operations.

The establishment of extension programs geared towards making use of social media and the internet as communication and information sharing tools for agricultural purposes is a plausible reality that will not be constrained by the lack of farmers’ knowledge on the technology in Trinidad and Tobago. This is a similar disposition to Medhi – Thies et al. (2014) who believed that the gap in perception of ICTs and social media use within the extension officer to farmer interface can be bridged with continuous support by extension officers in developing the competency of farmers in different applications of social media and internet technology. Extension programmers should consider training programs with social media and internet applications for accessing and sharing agricultural information with farmers and their households based on the observable effects of the household on farmers’ knowledge. Given the young and educated farmers consistently performed better in the knowledge test than the older and less educated farmers in this study, extension personnel should also consider engaging the younger and educated farmers within a community of practice as technology stewards for applying internet and social media technologies on farms.
In essence, farmers in Trinidad and Tobago are competent enough to apply social media and internet technology more on farms. The issue for the lack of adoption appears to be more an issue of extension personnel understanding the social dynamics of the farmers with respect to ICT use. The farmers’ knowledge of computers, the internet and social media is not a constraining factor to adopting social media in extension but a potential avenue to improve the communication efficiency with all stakeholders within farming communities.

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The Development and Validation of a Personal Agency Scale Based in the Community Capitals Framework

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Abstract
Used in a variety of community contexts and needs, the Community Capitals Framework (CCF) is an analytical tool to holistically examine the complex and unique characteristics that exist at the local level. While CCF—which focuses on social, human, cultural, political, natural, financial, and built capitals—has been used to collect community information to identify and assess suitable programming efforts, a gap currently exists in the literature providing agricultural and extension educators with the tools necessary to examine CCF characteristics, both at the community and individual levels. Designed as a pilot study targeting six counties in [STATE], this research developed a personal agency scale that was based on the seven capitals and intended to measure individuals’ perceived ability within a community. Internal structure validity was established by analyzing the response distributions of the individual items, evaluating internal consistency, and conducting exploratory factor analyses of the hypothesized latent variables. These results indicate that such a scale has potential to serve as a baseline set of data when considering program design, implementation, and evaluation purposes.

Keywords: community capitals, community development, personal agency, scale development
Introduction

Determining suitable community and economic development programs and assessing the utility of those efforts are challenges that concern development practitioners and researchers throughout the world (Billings, 2000; Picciotto, 2003). An increasingly popular approach to gathering information for use in program design and evaluation involves using the Community Capitals Framework (CCF). This framework serves as an analytical tool for organizing and holistically evaluating information related to different types of community resources (capital) and related community development programs (Emery & Flora, 2006; Pigg, Gasteyer, Martin, Keating, & Apaliyah, 2013). The CCF has been defined as “a way to analyze community and economic development efforts from a systems perspective by identifying the assets in each capital (stock), the types of capital invested (flow), the interaction among the capitals, and the resulting impacts across capitals” (Emery & Flora, 2006, p. 20). A capital is understood to be any asset or resource in which can be invested and has the potential to generate additional resources (Anderson, 2014; Emery, Fey, & Flora, 2006; Flora, Flora, & Gasteyer, 2016; Gutierrez-Montes, Emery, & Fernandez-Baca, 2009); whereas, community refers to a place-based collection of individuals where place is defined by its geographic location, built environment, and acquired meaning or value (Manzo & Perkins, 2006; McKnight, Sanders, Gibbs, & Brown, 2017). Implicit within the framework is the understanding that different place-based communities draw upon different capitals in distinct ways to address problems and initiate positive changes.

The CCF has been employed in varied contexts and in a range of international settings. For example, researchers used the framework to explore the feasibility and potential impact of agroecotourism in Cuban communities (Duffy, Kline, Swanson, Best, & McKinnon, 2017). It also has been used with the Managed Landscapes Approach (MLA) to guide participatory land-use processes in Panama (Gutierrez-Montes, Siles, Bartol, & Imbach, 2009). In addition, the CCF was combined with the Sustainable Livelihoods Framework (SLF) in rural Uganda to gather information necessary for designing sustainable livelihoods programs (Sseguya, Mazur, & Masinde, 2009). Other CCF-based research efforts have focused on community capitals as they pertain to sustainable tourism and livelihoods in Botswana (Stone & Nyaupane, 2018), and disaster preparedness and recovery in the United States (Himes-Cornell et al., 2018; Stofferahn, 2012). This variety and diversity of settings in which the CCF has been used demonstrate its applicability and value in collecting information used to identify and assess suitable programming efforts.

Valuable information targeted in the CCF is founded in community knowledge, which stems from the individual and collective perspectives of local populations. Residents of any community are likely to form opinions and attitudes about the places in which they live based on perceptions of how individuals are connected to each other and the physical environment of the community (Comstock et al., 2010; Raymond, Brown, & Weber, 2010), how they are sustained by educational and vocational opportunities (Agran, Snow, & Swaner, 1999; Aro, Rinne, Lahti, & Olkinuora, 2005; Uludag, 2008), and the ways in which community members and local leadership communicate with one another (Chun, Shulman, Sandoval, & Hovy, 2010; Sun, Wang, & Zhou, 2012). Community perceptions also can be based on personal agency, which is characterized by individual experiences and interactions with various elements of a community and how one views his or her ability to live according to personal values and principles (Bhattacharyya, 1995). While general perceptions indicate how a person views various structural components of a community, perceived personal agency signals the degree to which an individual feels they can act within the existing community structure to realize both personal and
community-wide goals (Harvey, 2002). When assessing program impact, the general and specific perspectives complement one another (Ohmer, 2007). From a community development perspective, understanding perceptions of the community as a whole and individual perceptions of their ability to act and change within it, provide insights and triangulation of observations (Greene & McClintock, 1985).

Personal agency has been defined in a number of ways but generally refers to a person’s ability to initiate some action and to act autonomously within an existing structural context (Campbell, 2009; Onyx & Bullen, 2000). Harvey (2002) contends that any definition of personal agency must primarily be concerned with a person’s capacity for altering his or her existing structural environment. Within a development context, agency among community members has been described as an individual having the ability to live according to personal convictions and the capacity for personal and community transformation (Bhattacharyya, 1995). As groups and communities are comprised of members, personal agency must also exist for these individuals.

Perceived personal agency might differ considerably from more general views toward the community in which people live (Dale & Sparkes, 2010). For instance, residents may have very positive views of various aspects of their community, but also feel that they are unable to satisfy the desire to act within that community to achieve personal or group goals or to live according to their own principles. Conversely, a person may have a generally negative view of one or more community characteristics, but also feel that they are able to generally navigate and operate within the existing community structure to realize personal or community objectives. Capturing these two perspectives may reveal whether views associated with personal agency are aligned with general community perceptions, providing a more comprehensive understanding of a community and its characteristics (Brooks, Waylen, & Mulder, 2012).

Currently there is a gap in the literature providing agricultural and extension educators, particularly those in international contexts, with the tools necessary to examine CCF characteristics, both at the community and individual levels. A study analyzing an empirical tool to quantify personal agency within the Community Capitals Framework may provide international agricultural educators and extension professionals a robust toolset to engage in community-oriented activity or interventions while acknowledging the role of the individual in such endeavors. Furthermore, this study is directly associated with recent recommendations within the literature to examine, formalize, and standardize evaluation tools capable of examining the impacts of programs and interventions (Borron, Lamm, Darbisi, & Randall, 2019).

**Conceptual Framework**

The CCF focuses on seven distinct but interrelated capitals. These capitals fall into two broad categories: human (intangible) capitals and material (tangible) capitals (Emery & Flora, 2006; Flora et al., 2016; Gutierrez-Montes, Emery, et al., 2009). The human capitals are social, human, cultural, and political; while the material capitals are natural, financial, and built. Each of the community capitals, irrespective of category, is related to the others in important and consequential ways (Flora et al., 2016). An investment in one capital will generally have an impact on other capitals in what has been described as a spiraling-up process (Emery & Flora, 2006). Conversely, a deficiency in one of the seven capitals may precipitate a downward spiral as other assets and resources are negatively affected (Stofferahn, 2012). Although the capitals are interrelated, they can be independently examined and defined to foster a better understanding of how each is associated with community assets and liabilities. Exploring the capitals in this way
also highlights the need for a valid instrument that can reliably measure resources. Such an instrument can assist in identifying appropriate entry points for community and economic development programs, as well as measure the impacts of such efforts. The following provides a brief overview of each capital as categorized by either human or material capitals.

**Human Capitals**

*Social capital* is generally understood to involve trust and reciprocity among community members. Flora (2004), for instance, defines social capital as “mutual trust, reciprocity, collective identity, cooperation and a sense of a shared future” (p. 8). It also can be viewed as the collective voice of an engaged and organized community seeking programmatic outcomes that are beneficial to all residents (Brown, 1996; Turner, 1999). Putnam (1995a, 1995b, 2000; Putnam, Leonardi, & Nanetti, 1993) defines social capital in terms of the various components that characterize social organization, such as networks, norms, and trust. These allow for cooperation among community members and groups as they coordinate their activities to more effectively advance shared ideas and objectives (Putnam, 1995a, 1995b). Putnam (1995a, 1995b) claims that greater social capital within a community promotes and sustains healthy networks of civic engagement. These networks make possible a higher quality of life by nurturing social trust, encouraging wider acceptance of reciprocity protocols, and facilitating collective actions (Putnam, 1995a). This perspective corresponds to Coleman’s (1988) contention that a high degree of social capital (characterized by trust and trustworthiness) among individuals within groups is associated with more positive outcomes.

*Human capital* refers to innate, acquired, and developed attributes of individual community members, such as their abilities, skills, knowledge, education, self-esteem, and health (Becker, 1962, 1993; Schultz, 1961). In short, it is “the characteristics and potential of individuals that are determined by the intersection of nature (genetics) and nurture (social interactions and the environment)” (Flint, 2010, p. 49). Human capital facilitates community improvement by providing individuals with the physical and intellectual means to recognize and access internal and external resources (Emery et al., 2006; Emery & Flora, 2006; Flora et al., 2016), and is closely associated with the embodied form of cultural capital (Bourdieu, 2018).

*Cultural capital* can be described as an awareness and understanding of the language and conventions associated with a dominant culture (Bourdieu, 2018; Sullivan, 2001). Bourdieu (2018) maintains that this form of capital can be conceived as existing in three states: the embodied state, the objectified state, and the institutionalized state. The embodied state is characterized by an individual’s natural intellectual and physical capacities. The objectified state refers to actual cultural materials such as books. These objects can be considered manifestations of advanced thought processes. The institutionalized state is a kind of objectified cultural capital that is acknowledged and approved by a formally recognized institution. This form of cultural capital is perhaps most widely illustrated by institutions of learning granting diplomas, degrees, and other academic credentials. These various states can result in some community members attaining an elevated cultural status and placed in a position of influence or power as a result. Cultural capital, then, plays an important role in determining “what voices are heard and listened to, which voices have influence in what areas, and how creativity, innovation, and influence emerge and are nurtured” (Emery & Flora, 2006, p. 21).

*Political capital* can be described as individual or group capacity for transforming community practices and conventions into recognized rules that influence how resources are allocated (Flora et al., 2016). Turner (1999) maintains that political capital is the product of
social and economic (financial) capital, as it incorporates community building, government assistance, and private financial contributions. Flint (2010) defines political capital as the ability of an individual, group, or community to guide the development of the regulations that determine how resources are allocated, and influence the enforcement of those regulations. Turner (1999) and Flint (2010) each describe political capital in terms of self-efficacy and associated actions, as it influences individual and community capacities for identifying and pursuing interests and control of those pursuits, ultimately giving rise to self-directed decisions and actions.

Material Capitals

*Natural capital* is the foundation upon which all other forms of capital are built (Flora et al., 2016). It refers to a community’s natural assets such as climate, weather, geography, topography, physical beauty, and quality of the land, air, and water. (Emery & Flora, 2006; Flora et al., 2016). Natural capital can provide communities with many economic benefits and development opportunities, but it can also limit how a community matures or expands. Natural capital assets can impact community and resident behavior, but are also affected by human endeavors (Flint, 2010). The resources can be classified as either renewable or non-renewable. The former is characterized by ecosystem resources while the latter refers to assets such as oil, coal, and natural gas (Costanza et al., 1997; Folke, Hammer, Costanza, & Jansson, 1994).

*Financial capital* is perhaps the most recognizable form of capital, largely because it is the easiest to quantify and many researchers consider other capitals in terms of the financial impacts (Flint, 2010). It can be described as the availability of financial resources to invest in a community to build and develop agency, support existing and new businesses, and generally accumulate wealth for further investment (Emery & Flora, 2006). Taxes, fees, savings, and credit all constitute forms of community financial capital (Flora et al., 2016). The equitable distribution of these assets, and their relationship to other resources, can result in a healthy and diverse local economy (Flint, 2010).

*Built capital* is the manufactured and constructed elements of a community, such as schools, factories, roads, bridges, and the assets supporting the deployment of technologies (Flora et al., 2016). It refers to the infrastructure that underpins the pursuits connected to other forms of capital (Emery & Flora, 2006; Flint, 2010). Because it supports other activities, built capital is generally viewed as having a positive impact on community and economic development. However, other capitals can be negatively affected when potentially adverse consequences are dismissed while advancing development concerns (Flora et al., 2016).

The Community Capitals Framework provides a comprehensive foundation for an empirical tool that could be used by researchers internationally or domestically to identify and analyze personal agency perspectives within a broad range of place-based communities. Determining the extent to which individuals feel they can function within, influence, and change existing structural elements of a community will assist in identifying entry points for in-depth research inquiry or program design. This detailed information will also provide a basis for evaluating the utility and efficacy of such efforts. An initial step toward gathering relevant perceptual data is the development and validation of an appropriate instrument designed to quantify and evaluate each capital based on individual perceptions of personal agency.

Purpose and Objectives

The primary purpose of this research was to design and validate a personal agency scale based on the Community Capitals Framework. The study sought to address three objectives:
1. Establish the internal structure validity (preliminary) for a personal agency scale based on the capitals comprising the CCF.
2. Determine whether the hypothesized latent variables—the community capitals—are present among the scale items.
3. Ascertain the extent to which the community capitals, as represented in the scale items, are correlated.

**Methods**

Guided by a thorough review of the literature concerning the Community Capitals Framework (Emery et al., 2006; Emery & Flora, 2006; Emery, Gutierrez-Montes, & Fernandez-Baca, 2013; Fey, Bregendahl, & Flora, 2006; Flora, 2004, 2011; Flora & Bregendahl, 2012; Flora et al., 2016; Gutierrez-Montes, Emery, et al., 2009; Pigg et al., 2013) and scale development (Crocker & Algina, 1986), a scale was constructed to quantitatively analyze each of the community capitals regarding personal agency at the community level. This scale comprised a number of statements developed to measure various characteristics endemic of each capital.

Several methods were used to ensure content validity. First, a review of the literature pertaining to the CCF was performed to ensure that each of the scale items addressed specific aspects of the community capitals. In addition, content validity was established using a text-based analysis of prevalent traits and themes, identification of proposed indicators, and formation of specific items concerning appropriate indicators. These processes resulted in seven scales representing each of the community capitals. Due to the closely interconnected nature of the assets constituting the built and financial capitals, precedent found in the literature (Flora & Bregendahl, 2012), and an exploratory factor analysis (EFA) indicating the items represented one latent variable, these capitals were combined to form an integrated built-financial capital scale. Finally, a panel of scale development and communication experts reviewed the scale items (DeVellis, 2017).

A total of 37 items were developed with individual capital scales consisting of between five and seven items. Items were incorporated into a survey designed to capture specific (i.e., personal agency) perceptions of community residents. An online survey company, Qualtrics, was used to develop a sampling frame by implementing a non-probability (or non-random sampling) purposive sampling method. Data collection procedures, in conformity with guidance found in the literature, included the utilization of attention filters. Only complete responses were retained and analyzed (Lamm & Lamm, 2019). The purposive sampling employed in this study involved criteria selection that corresponded to U.S. Census data at the county level, which was the unit of analysis, based on gender, race, and age characteristics. A five-point Likert-type scale (5 – *Strongly Agree* to 1 – *Strongly Disagree*) was used to record respondents’ level of agreement with each statement.

Conducted as a pilot study in fall 2018, data were collected in six counties purposively selected in [STATE]. The counties were chosen based on [UNIVERSITY] programming and outreach efforts taking place within these areas, as well as their capacity to equally represent rural, urban, and metropolitan regions. Because a non-probability sampling technique was applied, potential issues related to non-response error were not problematic; however, the results of this study cannot be generalized. A total of 123 responses were collected, with a total number of responses per county ranging from 10 to 33. The resulting data were analyzed using Statistical Package for the Social Sciences (SPSS) version 25.
To ensure response process validity, a panel of scale design experts not involved in the instrument development examined the proposed scale items. This group analyzed the proposed statements and provided suggestions based on directions, item interpretability, and potentially confusing scale items. Any suggested changes were further explored by the researchers in reviews with each panel expert. At the conclusion of this iterative process, the recommended scale changes consisted of minor phrasing revisions. Specific scale items and related instrument directions were subsequently updated (Crocker & Algina, 1986). Internal structure validity was examined by analyzing the response distributions of the individual items, evaluating internal consistency (Cronbach’s alpha), and conducting exploratory factor analyses of hypothesized latent variables (Clark & Watson, 1995; Crocker & Algina, 1986; Messick, 1995).

Results

The study analysis consists of two sets of complimentary procedures. First, each of the six capital factors were analyzed. Second, the overall latent variable, individual agency, was analyzed consisting of all 37 items. Results are presented for both sets of analyses beginning with the individual factors.

The social capital scale was comprised of six items concerning whether an individual (1) listens to the concerns of other community members, (2) joins other residents to support community efforts, (3) joins other residents to support local change efforts, (4) voices his/her concerns, (5) assists in developing a conversation around issues important to the community, and (6) feels connected to the community. A Kaiser-Meyer-Olkin (KMO) test value of 0.892 suggests that factor analysis of the scale variables is justified, while a Bartlett’s chi-square statistic ($x^2 = 545.473$) is significant ($p < .05$). A factor analysis of these items resulted in one extracted factor explaining 72.2% of the total variance (Table 1). Given that the factor loadings across the six items are 0.79 or above and the eigenvalue is relatively high (4.330), there is strong evidence that the social capital scale items are all components of the same latent construct.

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor 1</th>
<th>Communalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listen to concerns of community members</td>
<td>0.890</td>
<td>0.793</td>
</tr>
<tr>
<td>Join others to support community efforts</td>
<td>0.881</td>
<td>0.776</td>
</tr>
<tr>
<td>Join other to support local change efforts</td>
<td>0.891</td>
<td>0.794</td>
</tr>
<tr>
<td>Voice my concerns</td>
<td>0.815</td>
<td>0.664</td>
</tr>
<tr>
<td>Help develop a conversation around important issues</td>
<td>0.822</td>
<td>0.676</td>
</tr>
<tr>
<td>Feel part of the community</td>
<td>0.792</td>
<td>0.627</td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>4.330</td>
<td>——</td>
</tr>
<tr>
<td>Cumulative Variance Explained (%)</td>
<td>72.172</td>
<td>——</td>
</tr>
</tbody>
</table>

Table 1
Factor analysis: Social components

The human capital scale included seven items related to an individual perceiving they can (1) be a leader in the community, (2) manage differences among community members/groups, (3) learn about techniques and tools for decision making, (4) take action to address community...
challenges, (5) collaborate with others to impact community change, (6) make the community better, and (7) access resources for personal needs. A KMO test value of 0.885 indicates that a factor analysis of the human scale items is appropriate, and the Bartlett’s chi-square value ($x^2 = 623.014$) is significant ($p < .05$). Table 2 details the results of the factor analysis, which show that one factor explaining 68.2% of the total variance was extracted. This result, along with the substantial factor loadings for each of the items and the associated eigenvalue of 4.774, demonstrates that the human scale components are facets of the same underlying variable.

Table 2
Factor analysis: Human components

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor 1</th>
<th>Communalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Be a leader in my community</td>
<td>0.738</td>
<td>0.544</td>
</tr>
<tr>
<td>Manage differences among members and groups</td>
<td>0.843</td>
<td>0.710</td>
</tr>
<tr>
<td>Learn about techniques and tools for decision-making</td>
<td>0.863</td>
<td>0.744</td>
</tr>
<tr>
<td>Take action related to challenges affecting community</td>
<td>0.887</td>
<td>0.787</td>
</tr>
<tr>
<td>Collaborate to impact community change</td>
<td>0.857</td>
<td>0.735</td>
</tr>
<tr>
<td>Make my community better</td>
<td>0.850</td>
<td>0.723</td>
</tr>
<tr>
<td>Access resources for personal needs</td>
<td>0.728</td>
<td>0.530</td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>4.774</td>
<td>——</td>
</tr>
<tr>
<td>Cumulative Variance Explained (%)</td>
<td>68.193</td>
<td>——</td>
</tr>
</tbody>
</table>

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The cultural capital scale consisted of six related statements associated with an individual’s capacity to live according to personal principles and values, and to participate in local movements, cultural events, and traditions: (1) living out philosophical beliefs, (2) living out ethical values, (3) practicing cultural traditions, (4) participating in social movements, (5) obtaining or using culturally relevant products, and (6) developing a personal connection to the local community. The value of the sampling adequacy measure (KMO) is 0.862, suggesting that the scale items are suitable for a factor analysis. The Bartlett’s sphericity test value ($x^2 = 366.527$) for the scale items is significant ($p < .05$). The results of the factor analysis presented in Table 3 indicate that the personal agency items comprising the cultural capital scale are highly interconnected aspects of the same construct, with only one extracted factor explaining 63.4% of the total variance. The sizable loadings for each scale item and a relatively substantial eigenvalue of 3.807 also suggest that the items are all components of the same latent construct.

Table 3
Factor analysis: Cultural components

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor 1</th>
<th>Communalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live out my philosophical beliefs</td>
<td>0.749</td>
<td>0.561</td>
</tr>
<tr>
<td>Live out my ethical values</td>
<td>0.825</td>
<td>0.681</td>
</tr>
<tr>
<td>Practice cultural traditions</td>
<td>0.777</td>
<td>0.603</td>
</tr>
<tr>
<td>Participate in one or more social movements</td>
<td>0.814</td>
<td>0.662</td>
</tr>
<tr>
<td>Access culturally relevant products</td>
<td>0.810</td>
<td>0.656</td>
</tr>
</tbody>
</table>
The political capital scale included seven personal agency items related to an individual’s ability to interact and influence with community, regional, and national leaders. Specifically, survey participants were asked to indicate how they perceived their ability to (1) participate in groups that work to affect change, (2) communicate with local government leaders, (3) communicate with county or state government leaders, (4) communicate with leaders at the federal level, (5) join coalitions that advocate for positive community change, (6) develop advocacy coalitions that confront local issues, and (7) mobilize the resources necessary for community change. A Kaiser-Meyer-Olkin test value of 0.887 suggests that the scale items can be factor analyzed. A Bartlett’s chi-square statistic \( \chi^2 = 748.582 \) is significant \( (p < .05) \). The factor analysis of the political capital scale indicates that the items comprising the scale are highly interrelated and describe the same latent variable. The one extracted factor explains a substantial 72.6% of the total variance and has an eigenvalue larger than 5.0 (see Table 4).

Table 4

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor 1</th>
<th></th>
<th>Communalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Be part of group that works to affect change</td>
<td>0.824</td>
<td>0.679</td>
<td></td>
</tr>
<tr>
<td>Communicate with local government leaders</td>
<td>0.859</td>
<td>0.738</td>
<td></td>
</tr>
<tr>
<td>Communicate with county/state government leaders</td>
<td>0.873</td>
<td>0.761</td>
<td></td>
</tr>
<tr>
<td>Communicate with federal government leaders</td>
<td>0.818</td>
<td>0.669</td>
<td></td>
</tr>
<tr>
<td>Join advocacy coalitions that address local issues</td>
<td>0.854</td>
<td>0.730</td>
<td></td>
</tr>
<tr>
<td>Develop advocacy coalitions that address local issues</td>
<td>0.876</td>
<td>0.767</td>
<td></td>
</tr>
<tr>
<td>Mobilize resources for community change</td>
<td>0.859</td>
<td>0.737</td>
<td></td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>5.081</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cumulative Variance Explained (%)</td>
<td>72.581</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The five personal agency items comprising the natural capital scale correspond to residents’ perceived capacity to support and access local natural resources and amenities: (1) developing relevant projects, (2) accessing parks in the community, (3) accessing quality water, (4) voicing opinions concerning use of natural resources, and (5) expressing opinions on land development issues. Factor analysis of the natural scale items is appropriate given the KMO test value of 0.744 and a significant \( (p < .05) \) Bartlett’s chi square statistic \( \chi^2 = 272.597 \). The results presented in Table 5 demonstrate that one factor explaining 59.1% of the total variance was extracted. This factor has a sufficiently high eigenvalue of 2.954.
Table 5

Factor analysis: Natural components

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor 1</th>
<th>Communalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop projects that support natural resources</td>
<td>0.756</td>
<td>0.572</td>
</tr>
<tr>
<td>Access parks in my community</td>
<td>0.672</td>
<td>0.451</td>
</tr>
<tr>
<td>Access quality water</td>
<td>0.646</td>
<td>0.418</td>
</tr>
<tr>
<td>Voice my opinion on use of natural resources</td>
<td>0.892</td>
<td>0.795</td>
</tr>
<tr>
<td>Voice my opinion on land development issues</td>
<td>0.848</td>
<td>0.718</td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>2.954</td>
<td></td>
</tr>
<tr>
<td>Cumulative Variance Explained (%)</td>
<td>59.074</td>
<td></td>
</tr>
</tbody>
</table>

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The consolidated built-financial scale is made up of seven items covering respondent perceptions of personal contributions to employment and the broader local economy, and personal agency with respect to support of local projects and businesses. Specifically, the built-financial scale consists of items meant to measure perceptions of the individual’s ability to (1) contribute to the local economy, (2) create local jobs, (3) save local jobs, (4) obtain grants to support of community projects, (5) secure grant money for business development, and (6) influence the development of information-sharing tools. A KMO test value of 0.788 suggests that the built-financial scale warrants factor analysis, while a Bartlett’s test value ($\chi^2 = 483.232$) is significant ($p < .05$). The factor analysis results presented in Table 6 show that the built-financial scale measures only one construct that accounts for 62.5% of the total explained variance. The factor has an eigenvalue of 3.751 and with sufficient factor loadings across items. Perceived ability to contribute to the local economy, however, has a considerably lower factor loading.

Table 6

Factor analysis: Built-financial components

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor 1</th>
<th>Communalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contribute to the local economy</td>
<td>0.359</td>
<td>0.129</td>
</tr>
<tr>
<td>Help create local jobs</td>
<td>0.789</td>
<td>0.622</td>
</tr>
<tr>
<td>Help save local jobs</td>
<td>0.850</td>
<td>0.722</td>
</tr>
<tr>
<td>Apply for grants to support community project</td>
<td>0.865</td>
<td>0.749</td>
</tr>
<tr>
<td>Apply for grants to support business development</td>
<td>0.901</td>
<td>0.811</td>
</tr>
<tr>
<td>Inform the development of information-sharing tools</td>
<td>0.848</td>
<td>0.718</td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>3.751</td>
<td></td>
</tr>
<tr>
<td>Cumulative Variance Explained (%)</td>
<td>62.520</td>
<td></td>
</tr>
</tbody>
</table>

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The overall community capitals index (including each item from the constituent capital scales) also was analyzed. The overall scale was deemed suitable for factor analysis based on a
Kaiser-Meyer-Olkin test value of 0.903 and a Bartlett’s chi-square statistic ($\chi^2 = 4243.599$) that is significant ($p < .05$). When the overall index was factor analyzed, six components explaining 72.3% of the total variance were extracted.

The descriptive statistics displayed in Table 7 suggest that the capital scales and the overall community capitals index are highly reliable. The Cronbach’s alpha coefficient for each of the scales is greater than 0.8, indicating that the individual capital scales are internally consistent and that the dimensions comprising each of the scales are closely related. The coefficient for the overall index indicates a particularly high level of internal consistency (Cronbach’s alpha = 0.968). The validity of the internal structure was further confirmed by examining the indicators of normal response distribution.

<table>
<thead>
<tr>
<th>Capital Scales</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>Cronbach’s Alpha (a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social</td>
<td>123</td>
<td>3.908</td>
<td>0.736</td>
<td>-0.545</td>
<td>0.326</td>
<td>0.921</td>
</tr>
<tr>
<td>Cultural</td>
<td>123</td>
<td>3.879</td>
<td>0.682</td>
<td>-0.734</td>
<td>2.048</td>
<td>0.883</td>
</tr>
<tr>
<td>Natural</td>
<td>123</td>
<td>3.779</td>
<td>0.697</td>
<td>-0.562</td>
<td>1.334</td>
<td>0.824</td>
</tr>
<tr>
<td>Human</td>
<td>123</td>
<td>3.621</td>
<td>0.817</td>
<td>-0.419</td>
<td>0.382</td>
<td>0.920</td>
</tr>
<tr>
<td>Political</td>
<td>123</td>
<td>3.535</td>
<td>0.855</td>
<td>-0.288</td>
<td>0.127</td>
<td>0.936</td>
</tr>
<tr>
<td>Built-Financial</td>
<td>123</td>
<td>3.335</td>
<td>0.820</td>
<td>0.059</td>
<td>-0.201</td>
<td>0.875</td>
</tr>
<tr>
<td>Overall</td>
<td>123</td>
<td>3.668</td>
<td>0.650</td>
<td>--------</td>
<td>--------</td>
<td>0.968</td>
</tr>
</tbody>
</table>

Further analysis of the community capital scales indicates that the individual scales are highly correlated. As shown in Table 8, each of the correlation coefficients are above 0.6 and some are substantially higher. This suggests that there is a high degree of interconnectedness between the scales. This result addresses the third research objective.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cultural</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Built-Financial</td>
<td>.756*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Human</td>
<td>.735*</td>
<td>.787*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Social</td>
<td>.710*</td>
<td>.694*</td>
<td>.805*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Political</td>
<td>.659*</td>
<td>.657*</td>
<td>.725*</td>
<td>.813*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Natural</td>
<td>.652*</td>
<td>.650*</td>
<td>.717*</td>
<td>.626*</td>
<td>.618*</td>
<td></td>
</tr>
</tbody>
</table>

Note: * $p < .01$

**Conclusions, Recommendations, and Implications**

Determining the internal structure validity of the overall personal agency scale was the first research objective. To establish internal structure validity, descriptive statistics for every individual item comprising the overall community capitals scale were examined. Specifically, the skewness and kurtosis of the responses were analyzed to ascertain if the distributions were approximately normal. This individual item analysis demonstrated that the responses were normally distributed among the five Likert-type scale options. Every item comprising the overall
scale had a skewness value less than 2 and a kurtosis value less than 7, indicating that the internal structure of the overall scale was valid given established thresholds (Fabrigar, Wegener, MacCallum, & Strahan, 1999; West, Finch, & Curran, 1995). Internal structure validity also was established by obtaining the Cronbach’s alpha for each of the capital scales and the overall index. The alpha coefficients for each of the capital scales and the overall scale were well above the generally accepted threshold for establishing internal consistency and scale reliability.

Following the individual item analysis, an exploratory factor analysis was conducted for each of the capital scales and for the overall scale. One factor was extracted for each of the individual scales and six were extracted for the overall scale. These results suggest that the items comprising each scale are dimensions of the six latent constructs representing the community capitals. In addition, an overall index analysis was performed to test for internal consistency and normality. The findings indicate that the constructed CCF instrument was valid and holds promise for quantitatively analyzing personal agency perceptions within communities. Conducting a confirmatory factor analysis (CFA) is recommended for future research.

Although each of the research objectives was satisfied, there are some limitations associated with this research. First, this research utilized a small sample size and explored a limited number of counties which were chosen because of ongoing extension and outreach efforts within those counties. The small sample size could potentially influence the results of the factor analyses, though the generally high levels of communality indicated that this concern was somewhat mitigated (Mundrom, Shaw, & Ke, 2005). Future research should attempt to replicate these results using a larger and more comprehensive sample frame. In addition, this study is not associated with any community or economic development program; therefore, the data should be considered a baseline rather than a tactical approach from an impact perspective. Furthermore, the data used in the study were collected based on county of residence although counties are not always synonymous with communities and, as a result, the data are interpreted in aggregate across counties. However, there is a possibility that different communities within a particular county have different characteristics. Although consistent with similar attempts to quantify the CCF (e.g., Rupasingha, Goetz, & Freshwater, 2006), this is a limitation that should be acknowledged.

The importance of this study is demonstrated by its “intent to transition from an outside-in to an inside-out perspective when it comes to extension programming and community-engaged research” (Borron et al., 2019, p. 85). Extension professionals and other educators, particularly those involved in international efforts, should consider using a quantitative measure to first conduct a baseline diagnostic approach, identifying personal characteristics of individuals within the community. Following such baseline data, then unique entry points for in-depth research inquiry or program design can be identified accordingly. Because the instrument is designed to measure personal agency perceptions associated with each community capital and is not specific to any one type of community, it can be applied to communities across boundaries and cultures. One implication is that it is very likely that different individuals (perhaps defined by cultural groups or socioeconomic strata) within the same community may have varying degrees of perceived agency. Therefore, subsequent research activities should not be a one-size-fits-all, but rather be informed by a variety of perspectives of those that a given program is intended to serve—such as those with more agency, the least agency, or mean levels of agency.

Despite the limitations of this study, many of the results offer practical insights. Descriptively, there were observed differences among the capitals—social capital had the highest mean response score while built-financial capital had the lowest. For individuals who want to
engage with the communities based on the diagnostics results, possible follow-up methods could include an appreciative approach focusing on strengths rather than on gaps (Lamm & Lamm, 2018); or, in the case of marginalized communities, a culture-centered approach focusing on coalition building among marginalized members of the population could be used (Dutta, 2008). The intent is to shift the lens of community understanding to the inside-out perspective, ultimately reorienting community development efforts.

References


A Typology of University Agriculture Students’ Projected Motivations to Study Abroad: An Application of Q Methodology

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Abstract
The study’s purpose was to understand Louisiana State University freshman agriculture students’ projected motivations to study abroad. To achieve this, we used a Q methodological approach. When viewed through the lens of the expectancy-value model of achievement motivation, findings suggested students’ motivations could be interpreted through three typologies: (1) Goal-Oriented Students, (2) Social-Oriented Students, and (3) Learning-Oriented Students. In particular, the Goal-Oriented Students expressed they were motivated to enroll in a study abroad course because they perceived it could enhance their educational and career-related ambitions through personal growth. Meanwhile, Social-Oriented Students articulated that the social dimensions of study abroad courses, i.e., networking, relationship building, and opportunities to experience a new culture, served as their primary motivation. Finally, the Learning-Oriented Students reported their desire to gain more agricultural knowledge, experience an alternative method of instruction, and learn to work with diverse populations provided intrinsic value and encouraged them to study abroad in the future. As a consequence, this study’s findings not only broaden the study abroad literature but also provide implications for university administrators and faculty to better accommodate students through recruitment and programming tailored to their motivational needs.

Keywords: motivation; Q methodology; study abroad; university agriculture students
Introduction and Review of Literature

A fundamental role of institutions of higher education is to provide students opportunities to engage in high-impact educational experiences that foster personal and professional development (Kuh, 2008). In light of the growing impact of globalization on the behaviors and characteristics of colleges and universities (Mitchell & Nielsen, 2012), high-impact learning practices that support global learning and diversity education have been identified as an essential tenet of the core mission of universities (Kuh, 2008). Efforts to internationalize the college experience have, therefore, gained momentum across the higher education landscape, particularly in areas of developing and promoting education abroad. For example, findings from the most recent survey conducted by the American Council on Education ([ACE], 2017) revealed growth in the number of U.S. institutions implementing policies and practices to foster internationalization efforts. Moreover, the number of students enrolling in study abroad programs has continued to increase over the past decade, with roughly one in 10 students studying abroad in the 2017-2018 academic year (Institute of International Education [IIE], 2019a).

Recent calls to provide more educational opportunities abroad are supported by an extensive body of academic literature, in which myriad student benefits have been documented. In particular, the primary reported outcomes for students who studied abroad include: (a) enhanced cultural competence; (b) a more developed global perspective; (c) deeper understanding of international issues; (d) increased abilities to communicate and collaborate with diverse groups; (e) the development of international networks beneficial to students’ future careers; and (f) increased self-efficacy and self-confidence when working in unfamiliar situations (Bunch, Rampold, Cater, & Blackburn, 2018; Conner, Milius, Stripling, Loizzo, & Doerr, 2019; Conner & Roberts, 2015; Foster, Sankey Rice, Foster, & Barrick, 2014; Hainline et al., 2018; Roberts & Edwards, 2015, 2016). Students who participated in a study abroad course in college were also found to be more likely to continue to engage in intercultural activities in the future than students who had not participated (Murphey, Sahakyan, Yong-Yi, & Magnan, 2014).

The benefits students obtain through study abroad courses is also critical to the success of colleges of agriculture in producing high-caliber graduates prepared to enter the agricultural career pipeline (Alston, Roberts, & Warren English, 2019, 2020). As an illustration, today’s graduates must be prepared to navigate an interconnected global economy, increased competitiveness in the world market, and more accessible borders that have improved access to commodities and services (Lewis & Gibson, 2008). Colleges of agriculture have, therefore, been tasked with producing globally minded and skilled professionals (National Association of State and Land-Grant Colleges [NASULGC], 2004). In response, recent literature has primarily focused on identifying the best practices for creating effective study abroad courses in agriculture (Bunch et al., 2018; Conner et al., 2019; Conner & Roberts, 2015; Fabregas-Janeiro, Kelsey, & Robinson, 2011; Lamm et al., 2011; O’Malley, Roberts, Stair, & Blackburn, 2019; Pigg, Richardson, Roberts, & Stair, in press; Roberts & Edwards, 2015, 2016; Rodriguez & Roberts, 2011). However, well-designed programs may provide little value if university agriculture students continue to choose not to enroll. For example, less than 3% of the undergraduate students who studied abroad in the 2017-2018 academic year were enrolled in an agriculture major (IIE, 2019b). As a result, it is necessary for additional work to be dedicated to examine the best practices for the design and delivery of study abroad experiences while also more intimately distilling a profile of agriculture students’ projected motivations to participate.
Theoretical Framework

This study was grounded in Eccles and colleagues’ expectancy-value model of achievement motivation (Eccles et al., 1983; Wigfield & Eccles, 2000). Using a similar lens, Raczkoski, Robinson, Edwards, and Baker (2018) investigated relationships among agricultural and life sciences students’ overall motivation to study abroad and their perceived expectations of success, subjective-task value, and self-efficacy. A statistically significant and positive relationship was reported among each of the motivational factors and students’ overall motivation to study abroad (Raczkoski et al., 2018). Although some of the other evidence in the relevant body of work has not examined motivational constructs using the expectancy-value model, several investigations (Beseli, Warner, Kirby, & Jones, 2016; Murphey et al., 2014) have more broadly examined indicators of study abroad participation, and their findings suggest students are more likely to participate if they are motivated, self-efficacious, and perceive the associated costs do not exceed the value they assign to the experience. Therefore, much of the existing literature on study abroad in agriculture aligns with key features of the expectancy-value model.

Conceptually, the key outcome of the expectancy-value model is the ability to describe individuals’ achievement-related choices and performance. Eccles et al. (1983) theorized this outcome was directly influenced by individuals’ (a) expectations of success and (b) subjective task-values (Eccles et al., 1983; Wigfield & Eccles, 2000; see Figure 1). Expectations of success represent individuals’ beliefs about how well they will perform a task in the future. As such, students who have lower expectations of their abilities to succeed are less likely to enroll in a study abroad course. For example, Calliouet and Wood (2019) examined agricultural students’ perceived barriers to participate in an international experience. They found concerns about language skills were among the top five barriers to enroll in a study abroad course (Calliouet & Wood, 2019). When interpreting this finding through the expectancy-value model, students with such concerns would be unlikely to study abroad. Subjective task value refers to how the value assigned to a task influences an individual’s desire to actualize it in practice. Therefore, task value is subjective because individuals can attribute a range of values to the same task or activity based on their personal goals, beliefs, and memories (Wigfield, Tonks, & Klauda 2009). When applied to study abroad, subjective task value suggests students’ motivations to enroll can be explained, in part, by examining four key values they assign to the experience: (1) attainment value; (2) intrinsic value; (3) utility value; and (4) cost value. To investigate students’ projected motivations to study abroad, we emphasized the four aforementioned values during this study’s design (Eccles et al., 1983; see Figure 1).

Attainment value is the personal importance students place on doing well on a task in terms of their core values (Eccles et al., 1983). Therefore, attainment value incorporates aspects of self-identity because individuals may perceive a task or activity as important if they view success as central to their sense of self (Wigfield et al., 2009). Consequently, students who maintain that studying abroad aligns with their interests, or how they wish to view themselves, may assign a higher value to enrolling in a study abroad course and be more likely to engage. To demonstrate, Beseli et al. (2016) reported the influence of attainment value on motivation to study abroad by describing how some students were motivated because they were from a small town and desired to see the world. The second value, intrinsic, refers to the personal enjoyment individuals’ gain from performing a task. If an individual intrinsically values an activity, he or she will be more likely to participate and sustain engagement in the activity in the future (Wigfield et al., 2009). For example, students may assign a higher degree of value to studying
abroad if the intended outcomes align with their interests. Examples of intrinsic value identified in previous research include: (a) gaining overall life experience and life-changing opportunities; (b) experiencing other cultures; and (c) understanding how they can use their education to create a positive change in the world (Bunch et al., 2015; Caillouet & Wood, 2019; Danjean et al., 2015; Edgar, Edgar, & Hansen, 2018). Utility value refers to the perceived usefulness of a task and how it fits within an individual’s future goals or plans (Eccles et al., 1983). Students who believe studying abroad will enhance their employability may perceive participating in such a program as more valuable than students who do not (Bunch et al., 2015; Danjean et al., 2015; Edgar et al., 2018). Lastly, cost value refers to what individuals must give up to perform a task, as well as the anticipated effort needed to complete the task (Eccles et al., 1983; Wigfield et al., 2009). Program cost, being too busy with school or work, and time away from home and friends have been identified consistently across prior literature as barriers to study abroad participation (Briers, Shinn, & Nguyen, 2010; Bunch et al., 2015; Caillouet & Wood, 20019; Danjean et al., 2015; Edgar et al., 2018). Therefore, students with concerns regarding the time and the effort required to study abroad may not perceive the value of the experience outweighs the associated costs and will be less motivated to enroll. As a consequence, the expectancy-value model’s four values – attainment, cost, intrinsic, and utility – served as a critical lens in this investigation to examine students’ motivations to study abroad.

![Figure 1](image_url)

**Figure 1.** Expectancy-value model of study abroad achievement motivation. Adapted from “Expectancy-Value Model of Achievement Motivation” by J. S. Eccles, T. F., Adler, R. Futterman, S. B. Goff, & C. M., Kaczala, J. L., Meece, and C. Midgley, 1983, *Achievement and achievement motivation*, p. 75.

**Purpose and Research Question**

The study’s purpose was to understand freshman agriculture students’ projected motivations to study abroad at Louisiana State University. Using this purpose, we used one research question to guide the investigation: What patterns (i.e., the Q-sort factor load) emerged regarding freshman agriculture students’ projected motivations to study abroad?
Methods

In this study, we used Q methodology (Brown, 1980; McKeown & Thomas, 2013). Q methodology uses both quantitative and qualitative approaches through a unique data collection technique, called a Q sort, to understand the collective views of individuals on a phenomenon of interest (Watts & Stenner, 2013). In Q, McKeown and Thomas (2013) argued that small sample sizes are preferred since individuals’ observational perspectives are unique and should not be used to infer generalizability. Because of this, it is critical to ensure that participants’ perspectives emerge through analysis, using a blend of quantitative and qualitative techniques, rather than imposing researchers’ secondary interpretations (Brown 1980). Therefore, unlike the quantitative paradigm, validity and reliability are not major concerns in Q (Brown 1980; McKeown & Thomas, 2013). Instead, Q researchers place value on replication. As an illustration, rather than attempting to yield consistent internal factor structures, a Q researcher would place emphasis on understanding if, using a similar condition of instruction, comparable factors would emerge. Therefore, Q researchers do not attempt to generalize; rather, they offer an interpretation of participants’ subjective views at a moment in time (Brown, 1980; Watts & Stenner, 2013).

Instrumentation

In the instrument development phase, the researchers conducted a synthesis of the literature to understand how students’ motivations to study abroad have evolved over time. Using the themes from the literature, we then created an open-ended questionnaire in which we purposefully selected 60 freshman students, equally male ($n = 30$) and female ($n = 30$), from each academic department in the college of agriculture. In particular, we asked these individuals to reflect on their motivations to study abroad by providing narrative responses to three open-ended items: “What aspects of study abroad courses interest you the most?” “What aspects of study abroad courses have prevented you from enrolling before?” and “What aspects of study abroad courses concern you the most?” Students’ narrative responses were then analyzed using thematic analysis (Merriam & Tisdell, 2016). Through this strategy, we created 154 initial statements from participants’ words, which represented this investigation’s concourse (Watts & Stenner, 2013). However, because we perceived using all 154 statements would be too taxing on participants, we developed theoretical categories using expectancy-value theory to facilitate a sampling of 36 statements, i.e., the study’s Q set. Of note, the statements were organized to reveal four homogenous theoretical categories: (1) attainment value, (2) cost value, (3) utility value, and (4) intrinsic value. However, we also emphasized heterogeneity within each category by presenting the concept in different ways. A description of each theoretical category is provided in Table 1.

<table>
<thead>
<tr>
<th>Category</th>
<th>Description of Category</th>
<th># of Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attainment Value</td>
<td>Statements that relate to the personal importance students place on doing well as a result of study abroad and how it speaks to their self-identity.</td>
<td>8</td>
</tr>
<tr>
<td>Cost Value</td>
<td>Statements that include negative aspects of engaging in study abroad, such as time, effort, and more.</td>
<td>8</td>
</tr>
<tr>
<td>Intrinsic Value</td>
<td>Statements related to the personal enjoyment that students attain from participating in a study abroad.</td>
<td>8</td>
</tr>
</tbody>
</table>

Table 1

Theoretical Categories of the Q-Set
<table>
<thead>
<tr>
<th>Category</th>
<th>Description of Category</th>
<th># of Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utility Value</td>
<td>Statements revolved around how study abroad may relate to students’ goals, such as their future career.</td>
<td>8</td>
</tr>
</tbody>
</table>

**Q Set and Data Collection**

For this investigation, we sought to understand the dominant perspectives that emerged in regard to freshman undergraduate agriculture students’ motivations to study abroad. To accomplish this, we purposefully sampled 20 sorters who (a) were a freshman in the college of agriculture at Louisiana State University, and (b) had not participated in a study abroad course. Further, to ensure a diversity of perspectives were represented, we prioritized recruiting sorters from each academic department in the college of agriculture at Louisiana State University with an undergraduate program. As a result, we successfully recruited 12 females and eight males sorters. Next, we asked our 20 participants, i.e., our Q set, to sort 36 randomized statements into three separate categories: (1) most like me, (2) neutral, and (3) most unlike me (McKeown & Thomas, 2013). Thereafter, they placed the individual statements onto a forced distribution (see Figure 2) ranging from -4 to +4 using the condition of instruction: “What are your motivations to study abroad?"

![Figure 2. Forced distribution used to collect data during the Q-sort.](image)

**Data Analysis**

After sorts were completed, we then used PQMethod version 2.35 to analyze our data (Schmolck, 2014). Three statistical tests were conducted: (a) correlation, (b) factor analysis, and (c) a summated computation of factor scores. Of note, we did not correlate items, or statements, using the traditional factor analysis approach. Instead, we correlated individual sorts following the conventions advanced by Brown (1980). Then, to extract factors, we used principle component analysis (PCA) by which we compared one, two, three, four, and five-factor solutions (Schmolck, 2014). After this procedure, we elected to use a three-factor solution to represent our findings because it captured (a) the largest number of total participants and (b) the great amount of explained variance, i.e. 62%. After identifying three factors, we analyzed (a) eigenvalues, (b) factor arrays, (c) factor loadings, (d) factor scores, and (e) each factor’s unique consensus and distinguishing statements. Further, we also identified defining sorts by analyzing the factor
matrix (see Table 2), using a significance level of .042 in which all 20 sorts were identified as defining. It should also be noted that correlations among factors were negligible \( r = -0.02 \) (1-2); 0.07 (1-3); and 0.08 (2-3), which indicated that our selected factor solution was quality and reflected the diverse perspectives of participants (Brown, 1980).

Table 2

<table>
<thead>
<tr>
<th>P Number/Gender</th>
<th>Age</th>
<th>Race</th>
<th>Academic Department</th>
<th>Factor Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>2-male</td>
<td>18</td>
<td>White</td>
<td>Ag Econ/Business</td>
<td>0.74a</td>
</tr>
<tr>
<td>5-female</td>
<td>19</td>
<td>White</td>
<td>Nutrition/Food Science</td>
<td>0.81a</td>
</tr>
<tr>
<td>8-male</td>
<td>19</td>
<td>White</td>
<td>Natural Resources</td>
<td>0.73a</td>
</tr>
<tr>
<td>10-female</td>
<td>18</td>
<td>Black</td>
<td>Textiles &amp; Merchandising</td>
<td>0.85a</td>
</tr>
<tr>
<td>11-male</td>
<td>18</td>
<td>White</td>
<td>Plant Science</td>
<td>0.71a</td>
</tr>
<tr>
<td>12-male</td>
<td>18</td>
<td>White</td>
<td>Animal Science</td>
<td>0.80a</td>
</tr>
<tr>
<td>17-female</td>
<td>20</td>
<td>White</td>
<td>Ag Econ/Business</td>
<td>0.79a</td>
</tr>
<tr>
<td>19-female</td>
<td>20</td>
<td>Mixed</td>
<td>Plant Science</td>
<td>0.77a</td>
</tr>
<tr>
<td>1-female</td>
<td>19</td>
<td>White</td>
<td>Plant Science</td>
<td>0.01</td>
</tr>
<tr>
<td>3-male</td>
<td>19</td>
<td>White</td>
<td>Textiles &amp; Merchandising</td>
<td>0.18</td>
</tr>
<tr>
<td>14-female</td>
<td>18</td>
<td>Native American</td>
<td>0.07</td>
<td>0.53b</td>
</tr>
<tr>
<td>15-female</td>
<td>18</td>
<td>White</td>
<td>Natural Resources</td>
<td>-0.01</td>
</tr>
<tr>
<td>13-male</td>
<td>18</td>
<td>Black</td>
<td>Ag Econ/Business</td>
<td>0.21</td>
</tr>
<tr>
<td>18-male</td>
<td>19</td>
<td>White</td>
<td>Agricultural Education</td>
<td>-0.11</td>
</tr>
<tr>
<td>20-male</td>
<td>19</td>
<td>White</td>
<td>Animal Science</td>
<td>0.17</td>
</tr>
<tr>
<td>4-female</td>
<td>19</td>
<td>Other</td>
<td>Plant Science</td>
<td>0.05</td>
</tr>
<tr>
<td>6-female</td>
<td>18</td>
<td>Black</td>
<td>Nutrition/Food Science</td>
<td>-0.09</td>
</tr>
<tr>
<td>7-male</td>
<td>18</td>
<td>White</td>
<td>Agricultural Education</td>
<td>0.14</td>
</tr>
<tr>
<td>9-female</td>
<td>18</td>
<td>Black</td>
<td>Natural Resources</td>
<td>-0.01</td>
</tr>
<tr>
<td>16-female</td>
<td>18</td>
<td>White</td>
<td>Agricultural Education</td>
<td>0.13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Defining Sorts</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>% Explained Variance</td>
<td>39%</td>
<td>10%</td>
<td>13%</td>
</tr>
</tbody>
</table>

\[ \text{Note.} \ a\text{Indicates a defining sort for Factor 1.} \ b\text{Indicates a defining sort for Factor 2.} \ c\text{Indicates a defining sort for Factor 3.} \]

To help interpret the study’s findings, we conducted follow-up interviews with three individuals from each factor who loaded high on the factor but did not load significantly on the other two factors. Then, using NVivo® qualitative analysis software, we analyzed the high and pure loaders’ responses using the constant comparative method (Corbin & Straus, 2015). After qualitative analysis, we employed Mauldin’s (2012) Q interpretation procedures and compared the qualitative data against (a) participants’ demographic information, (b) array positions of statements on each factor, (c) correlations between factors, (d) Z-score differences, (e)
distinguishing statements, and (f) consensus statements. Through this comparison of existing divergences and convergences among the data sources, we created a profile of each factor (Mauldin, 2012). Finally, we interpreted each profile through our theoretical framework, a process that helped emerge three diverse perspectives: (a) Goal-Oriented Students, (b) Social-Oriented Students, and (c) Learning-Oriented Students. Each perspective represents the motivational viewpoints freshman undergraduate agriculture students at Louisiana State University held in regard to studying abroad. Using key data from this investigation, we next narratively describe each emergent perspective in the presentation of findings.

**Results**

Through our analysis, we operationalized the emergent patterns, i.e., the significant Q-sort factor loadings, as typologies. A typology is the classification of individuals based on empirical evidence (Watts & Stenner, 2013). We identified three typologies that explained 62% of the total variance regarding freshman university agriculture students’ projected motivations to enroll in a study abroad course at Louisiana State University: (1) Goal-Oriented Students, (2) Social-Oriented Students, and (3) Learning-Oriented Students. To discern each typology, we used significant statements from the concourse, with accompanying statement numbers and factor array positions noted in parentheses, as well as qualitative responses captured during follow-up interviews to provide a rich narrative of the study’s findings. A description of each typology follows.

**Typology #1 – Goal-Oriented Students**

Eight participants, equally male and female, loaded significantly on the first typology, which accounted for 39% of the total variance. From Goal-Oriented Students’ perspectives, their motivation to enroll in a study abroad course was primarily to further their educational and career-related aspirations (24, +4), i.e., it held utility value (Eccles et al., 1983). For example, they perceived including their experiences abroad on a résumé could help them be more attractive to potential employers (20, +4). As an illustration, one male high and pure loader shared: “My professors have said that international experience can make you more marketable for internships and other jobs, so that made me realize that I should probably plan to study abroad before I graduate.” The Goal-Oriented Students were also motivated to enroll in a study abroad course in the future because they perceived it could help them achieve growth in key dimensions of their personal lives (4, +3). For instance, individuals holding this perspective reported they sensed study abroad courses might help them expand their horizons (28, +3) and learn to work with individuals from diverse backgrounds (19, +3). When probed during a post-sort interview about how a study abroad course might foster their personal development, one female high and pure loader revealed: “I have friends who have studied abroad and they talked about how the experience changed them. So, I think it would really push me to make me think differently.” Table 3 offers statements from the concourse central to this typology.

<table>
<thead>
<tr>
<th>No.</th>
<th>Statement</th>
<th>Array Position</th>
<th>Theoretical Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>24a</td>
<td>Study abroad courses interest me because I believe it could help me develop employment skills.</td>
<td>+4</td>
<td>Utility Value</td>
</tr>
</tbody>
</table>
Typology #2 – Social-Oriented Students

Driven by the social dimensions of study abroad courses, seven individuals represented the Social-Oriented Students typology. Of note, the Social-Oriented Students exhibited the most racial diversity of the identified typologies with four reporting they were white, one black, one Native American, and the other student identifying as mixed race. Further, the Social-Oriented Students were nearly equally divided between males (n = 3) and females (n = 4). Individuals representing this typology maintained they were motivated by the potential to meet and network with new contacts (35, +4) and study abroad with friends and others in their social network (2, +4). Nevertheless, the financial cost associated with the experience served as a major deterrent to their decision enroll (10, +3). Case in point, one male high and pure loader revealed: “I have talked about it with some of my friends, but most of them [study abroad courses] were too expensive for me right now.” Social-Oriented Students also reported they were driven by the opportunity to experience new food and culture (30, +3), which could help them expand their horizons and begin to think differently in the future (6, +3). As a result, from the perspective of individuals comprising this typology, study abroad courses were a valuable use of their time (7, -3). During a follow-up interview, one high and pure loader expanded on this notion: “Study abroad courses seem really fun but also seems like they could help you grow as a person.” Social-Oriented Students’ significant statements are presented in Table 4.
Table 4
Array Positions for Social-Oriented Students Statements

<table>
<thead>
<tr>
<th>No.</th>
<th>Statement</th>
<th>Array Position</th>
<th>Theoretical Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>35a</td>
<td>Study abroad interests me because I enjoy meeting and networking with new people</td>
<td>+4</td>
<td>Intrinsic Value</td>
</tr>
<tr>
<td>2a</td>
<td>I am interested in study abroad because I have friends that will go with me.</td>
<td>+4</td>
<td>Attainment Value</td>
</tr>
<tr>
<td>10</td>
<td>The financial cost of study abroad discourages me.</td>
<td>+3</td>
<td>Cost Value</td>
</tr>
<tr>
<td>30a</td>
<td>I am interested in study abroad because I want to experience different types of food and culture.</td>
<td>+3</td>
<td>Intrinsic Value</td>
</tr>
<tr>
<td>6</td>
<td>A study abroad course interests me because meeting different types of people will help me think differently.</td>
<td>+3</td>
<td>Attainment Value</td>
</tr>
<tr>
<td>22</td>
<td>I am interested in studying abroad because I want to be more competitive for university level awards.</td>
<td>-3</td>
<td>Intrinsic Value</td>
</tr>
<tr>
<td>13</td>
<td>Concerns about my safety in a different country are a barrier to my participation in a study abroad.</td>
<td>-3</td>
<td>Cost Value</td>
</tr>
<tr>
<td>7</td>
<td>I am not interested in studying abroad because I do see value in the experience.</td>
<td>-3</td>
<td>Attainment Value</td>
</tr>
<tr>
<td>17a</td>
<td>The emotional toll of study abroad courses is a barrier.</td>
<td>-4</td>
<td>Cost Value</td>
</tr>
<tr>
<td>14</td>
<td>Concerns about communication barriers discourage me from studying abroad.</td>
<td>-4</td>
<td>Cost Value</td>
</tr>
</tbody>
</table>

Note. aIndicates distinguishing statements for the Social-Oriented Students typology.

Typology #3 – Learning-Oriented Students

The final typology, Learning-Oriented Students, represented students who were primarily female (4/5). From this perspective, motivation to enroll in a study abroad course was grounded in their curiosity to acquire new insights through global engagement, i.e., it held intrinsic value (Eccles et al., 1983). In particular, the Learning-Oriented Students desired to learn more about agricultural production practices in another country (31, +4). Further, they viewed study abroad courses as an attractive option because of its design, experiential nature, and because it served as an alternative method of instruction (32, +4). The Learning-Oriented Students also perceived that study abroad courses could help them learn to work with diverse and underprivileged populations (19, +3; 8, +3) as well as to create a positive change in the world (5, +3). Or, as one high and pure loader explained: “I want to make an impact on the world so I think a study abroad course could help me understand how I can impact agriculture in other countries.” Table 5 provides an overview of the array positions of the Learning-Oriented Students.
Table 5
Array Positions for Learning-Oriented Students Statements

<table>
<thead>
<tr>
<th>No.</th>
<th>Statement</th>
<th>Array Position</th>
<th>Theoretical Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>31a</td>
<td>Studying abroad interests me because I would like to see how agriculture is practiced in different countries.</td>
<td>+4</td>
<td>Intrinsic Value</td>
</tr>
<tr>
<td>32a</td>
<td>I am interested in study abroad because I want to experience a different teaching approach.</td>
<td>+4</td>
<td>Intrinsic Value</td>
</tr>
<tr>
<td>5a</td>
<td>I am interested in studying abroad because I want to learn how to create positive change in the world.</td>
<td>+3</td>
<td>Attainment Value</td>
</tr>
<tr>
<td>19a</td>
<td>A study abroad experience could help me better understand how to work with people from diverse backgrounds in my future career.</td>
<td>+3</td>
<td>Utility Value</td>
</tr>
<tr>
<td>8</td>
<td>I want to study abroad because I want to expand my understanding of what it means to be underprivileged.</td>
<td>+3</td>
<td>Attainment Value</td>
</tr>
<tr>
<td>1</td>
<td>I’m not been interested in studying abroad because the courses do not align with my interests.</td>
<td>-3</td>
<td>Attainment Value</td>
</tr>
<tr>
<td>12</td>
<td>I am not interested in participating in a study abroad because being in an unfamiliar culture scares me.</td>
<td>-3</td>
<td>Cost Value</td>
</tr>
<tr>
<td>13</td>
<td>Concerns about my safety in a different country are a barrier to my participation in a study abroad.</td>
<td>-3</td>
<td>Cost Value</td>
</tr>
<tr>
<td>2a</td>
<td>I am interested in study abroad because I have friends that will go with me.</td>
<td>-4</td>
<td>Attainment Value</td>
</tr>
<tr>
<td>17</td>
<td>The emotional toll of study abroad courses is a barrier to my participation.</td>
<td>-4</td>
<td>Cost Value</td>
</tr>
</tbody>
</table>

Note. aIndicates distinguishing statements for the Learning-Oriented Students typology.

Conclusions

The purpose of this study was to understand freshman undergraduate agriculture students’ projected motivations to study abroad. When viewed through the lens of the expectancy-value model (Eccles et al., 1983), findings suggested that students’ motivations at Louisiana State University could be interpreted through three typologies: (1) Goal-Oriented Students, (2) Social-Oriented Students, and (3) Learning-Oriented Students. In particular, the Goal-Oriented Students expressed they were motivated to enroll in a study abroad course because they perceived it could enhance their educational and career-related ambitions through personal growth – a notion Eccles et al. (1983) described as utility value. This finding also aligns with those reported by Briers et al. (2010) that one of the primary motivations for university agriculture students to engage in international experiences is to enhance their competitiveness in their future careers.

Social-Oriented Students, the most racial diverse typology, articulated that the social dimensions of study abroad courses, i.e., networking, relationship-building, and opportunities to experience a new culture, served as their primary motivation – a notion that somewhat supports Eccles et al., (1983) description of intrinsic value. However, literature on the role social
influences play in serving as a primary motivation for agriculture students, especially regarding racial minority groups, to study abroad is scant. Finally, the Learning-Oriented Students, who were primarily female, reported their desire to gain more agricultural knowledge, experience an alternative method of instruction, and learn to work with diverse populations provided intrinsic value (Eccles et al., 1983) to encourage them to enroll in a study abroad course in the future, which is supported by literature reported in agricultural education (Danjean, et al., 2015; O’Malley et al., 2019; Raczkoski et al., 2018). Our findings, therefore, provided important insights into expectancy-value theory and practice regarding the design and delivery of study abroad courses. For instance, this study’s findings could be used as a basis to explore new dimensions of expectancy-value (Eccles et al., 1983; Wigfield et al., 2009) regarding the need to more intimately understand the role that social dimensions play in foregrounding motivation. Finally, we conclude that cost value – financial, safety, and time related concerns – did not appear to profoundly influence the typologies distilled in this investigation (Eccles et al., 1983). As a consequence, our findings conflict with those reported by Raczkoski et al. (2018).

Implications, Recommendations, and Discussion

As the blurring of borders between nations threatens to intensify, agricultural capital, labor, and trade will likely become more globally integrated in the future (Mitchell & Nielsen, 2012). Such trends present daunting challenges for U.S. colleges of agriculture that have, historically, struggled to motivate students to enroll in educational opportunities abroad (IIE, 2019b). As a result, today’s graduates appear ill prepared to tackle a world fraught by increasingly complex agricultural issues and problems (Alston et al., 2019, 2020). In response, the current study identified three typologies that represented freshman university agriculture students’ projected motivations to enroll in a study abroad course at Louisiana State University. Moving forward, we recommend that university administrators and faculty consider carefully the motivational characteristics of agriculture students identified in this investigation and use this knowledge to create recruitment and communication campaigns intended to target students’ diverse interests. We also recommend that future research explore the types of recruitment strategies that influence students’ intentions and actualized behaviors (Ajzen, 1991) to participate. Further, because students reported that cost value (Eccles et al., 1983) was not a primary factor influencing their motivation, we recommend that colleges of agriculture emphasize the value-added characteristics of study abroad courses to increase the likelihood of student enrollment moving forward.

A unique aspect of this study was that we analyzed indicators of students’ motivation to enroll in a study abroad course by interpreting how such coalesced holistically to form patterns of thought (i.e., the Q-sort factor loadings). As a result, this approach offered a more granular profile of freshman agriculture students’ motivations. For example, much of the previous research on student motivation to study abroad has focused on assessing the contribution of individual variables (Beseli et al., 2016; Danjean, et al., 2015; Raczkoski et al., 2018). However, through the use of Q methodology, we demonstrated how key motivational factors combined, clashed, and fomented to form three dominant perspectives or typologies. By providing this gestalt level view, students’ motivational needs can now be better accommodated through tailored programming. As such, we recommend that faculty who lead study abroad courses not only dedicate curricular space to engage students in agriculture-related content but also provide opportunities for students to reflect, individually and socially, on career advancement, being
more inclusive of diverse groups and perspectives, networking, relationship-building, and the integration of their learning abroad into their daily lives.

Although our intent was not to generalize from the study’s findings (Brown, 1980), the demographic composition of typologies, particularly the Social-Oriented Students’ and Learning-Oriented Students’ perspectives, warrant further study to examine whether such dimensions are transferable across contexts. Also, because of students’ emphasis on aspects of attainment, intrinsic, and utility values (Eccles et al., 1983) in this study, more research is needed to describe how these variables converge and diverge to shape motivation. Perhaps more intimately defining students’ motivational schemas can attain a better understanding of how to foster students’ perspective transformations (Mezirow, 2000) on global agricultural issues during their experiences abroad. Further, future research should also explore the specific programmatic aspects that significantly affect student motivation. This study’s findings also opened up additional questions that warrant future consideration. First, what are the effects of recruitment strategies that target students’ motivational interests over time in comparison to individual course-focused campaigns that are more short-term in form and function? And finally, which academic, career, cultural, and personal experiences most profoundly contribute to motivating and deterring students from studying abroad?

References


Piloting of the Concerns-based Adoption Model: Farmer Concerns About the Participatory Guarantee System in Cambodia

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Abstract
While there is a large body of adoption and agricultural extension literature on the process of introducing a new technology, agricultural development projects are often expected to produce immediate results that do not always allow for the integration of these theories into practice. The Concerns-based Adoption Model (CBAM) is a framework that places participants at the center of the change process to identify their concerns and challenges, providing a roadmap for projects to guide individuals with the correct support for their particular stage of adoption. CBAM has typically been used for the introduction of new curriculum in formal education. But this study assessed the potential for CBAM to be applied to agriculture innovations. In this study, we adapted and piloted the CBAM “Stages of Concern” model to assess adoption of an agriculture innovation. The innovation is the Participatory Guarantee System (PGS) for Cambodian vegetable farmers. We assessed the potential for CBAM as a tool for agricultural development project management. We found that the adapted survey consistently placed farmers in the anticipated Stage of Concern. Identifying users’ Stages of Concern can inform program designers and practitioners, assisting in tailoring support across the adoption process. CBAM has the potential to inform participatory project design and give project administrators an evidence-based, systematic protocol for assessing the adoption process, adding another tool to the development practitioners’ toolbox.

Keywords: Diffusion of Innovations, adoption, project design

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Introduction

Within the context of international development, there is renewed interest in participatory programming and increased pressure for development project practitioners to produce rapid results with significant, evidence-based impacts (Ticehurst & Cameron, 2000; Woolcook, 2011). However, these two strategies can be contradictory. Participatory development usually takes extra time, and project results are often incremental. In this environment, there is a need for tools that systematically help development practitioners to integrate participant feedback and concerns into programming and evaluation (Ticehurst & Cameron, 2000).

Agricultural extension and experiential education scholars recognize change is an ongoing process, moving individuals through stages of learning, adoption, and finally integration into a community (Baker, Robinson, & Kolb, 2012; Dewey 1938; Kolb, 1984; Rogers, 2003). In the education sector, the Concerns-based Adoption Model (CBAM) is a framework for critically assessing the adoption process when introducing new teaching curricula or educational tools to instructors. It acknowledges that new users go through a cycle of concerns, and levels of use of an innovation, as they engage with new material, try new skills, and integrate these into their existing schema (Hall, Wallace, & Dossett, 1973).

Participatory agricultural development often involves a similar presentation of new tools or systems that farmers might want to incorporate into their ongoing activities. CBAM has the potential to be a useful tool for participatory agriculture programs to monitor the change process at the individual level and to aid in supporting communities throughout the adoption process. While there are studies on CBAM in the broader field of education and teacher training (Kelly & Staver, 2004; Tunks & Weller, 2009), the literature indicates two studies applied this method in the agriculture setting (Cashman, 1990; Myers, Barrick, & Samy, 2012).

One study was in Egypt, where Myers et al. (2012) used CBAM to evaluate the introduction of active learning into agriculture technical schools. Their study applied CBAM to agricultural education, and it was conducted in a traditional educational setting, focusing on classroom tools and curriculum, as most CBAM applications do. The other study was in Nigeria, where Cashman (1990) evaluated the adoption process of alley cropping by farmers using an adapted version of CBAM. Cashman (1990) demonstrated “CBAM provides a diagnosis of farmers’ needs, as well as prescription for action” (p. 102). CBAM has only been adapted and implemented once in the context of agriculture innovations. For this reason, we conducted an assessment of CBAM as a tool for assessing farmers’ concerns and then incorporated those concerns into project design.

Our three-month study takes place in Cambodia, where the Safe Vegetable Value Chain project (SVVC) helps farmers meet market demands for safe, domestically-produced vegetables by introducing production and postharvest technologies to improve phytosanitary quality, and by creating new marketing channels. This USAID funded project first operated in Kandal province from 2010 to 2015 and thereafter moved to Battambang province. In Kandal, SVVC introduced net houses to protect crops from pests, and partnered with a wholesale vegetable supplier to introduce a Participatory Guarantee System (PGS). In 2015, SVVC received further USAID funding to conduct similar work in Battambang province.

Because, in Cambodia, there is a demand for technical training in value chain development and topics such as food processing and food safety (Gill, Ricciardi, Bates & James, 2017), this project introduced a PGS. As an alternative to conventional marketing systems, locally-defined standards and certification programs such as the PGS emphasize building confidence and trust between stakeholders, offering a way for smallholder farmers to reach
higher standards, and enhance safety of agricultural products (Nelson et al., 2016). Buyers, growers, and other stakeholders set production and handling standards based on organic principles that are realistic and relevant to that unique community and market. Of particular importance is the development of a participatory community evaluation process to ensure compliance.

Theoretical Framework

The process of change and adoption of innovations has been extensively studied since the 1930s. Central to this work was experiential learning (Dewey, 1938; Baker et al., 2012), and its focus on a circular process led by an individual’s desire to solve immediate problems. Dewey (1938) posited learning is an individual process based on “the organic connection between education and personal experience” (p. 25). Dewey (1938) and Kolb (1984) acknowledge prior experiences of individuals, quality of experiences, and integration of that experience through reflection, as central to learning.

Change-theorists describe the change process through stepwise models. Lewin (1947) and Chambers (2007) focus on the importance of involving participants in the planning phase and group dynamics. Havelock found deficiencies in other models and introduced the concept of the “linkage model” that develops users’ transferable skills and builds collaborative relationships to help solve problems (Havelock, 1971). The theory was built on a six-phase model: 1) pre-contemplation of the need for change; 2) diagnosing the problem; 3) acquiring the resources for change; 4) identifying the solution; 5) implementing; and, 6) maintaining the change (Havelock, 1973).

The diffusion of innovation theory (Rogers, 2003) describes agricultural technology adoption. Based on experiences in Iowa, Rogers (2003) recognized the importance of a social network of peers in innovation uptake and adoption. Like experiential learning theory, diffusion of innovations theory includes a behavior-change framework rooted in the idea that change is a process where individuals adopt new concepts through a predictable social process (Rogers, 2003). According to Rogers (2003), the rate of adoption is influenced by the attractiveness of the innovation’s positive aspects, positive communication during the uptake of a new innovation, and the strength of an individual’s social system.

The Concerns-based Adoption Model (CBAM) framework was developed as a way to “understand the personal side of the change process” and to model the adoption of new curriculum and educational tools (George, Hall, & Stiegelbauer, 2006, p. 2; Hall, Wallace, & Dossett, 1973). Based on the theories of Rogers and Havelock, the CBAM model focused the change process on the individual and created a framework for integrating individual users’ conceptions and concerns into the adoption of a technique or tool (Hall et al., 1973). The CBAM is composed of three elements: a) innovation concerns; b) stages of concern (SOC); and, c) levels of use of an innovation. To expand: first, program designers articulate a clearly communicated vision of each element of the new innovation (innovation concerns); next, they monitor new users’ concerns (SOC); and finally, they practice with the innovation (levels of use) to better tailor support as adopters move through the cycle of change.

In CBAM, an individual’s Stages of Concern are grouped into three categories: self, task, and impact. These are based on empirical evidence from the adoption process in Table 1.

Table 1
Stages of Concern about an innovation

![Table 1](image-url)
<table>
<thead>
<tr>
<th></th>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Refocusing</td>
<td>The individual focuses on exploring ways to reap more universal benefits from the innovation, including the possibility of making changes or replacing it with an alternative.</td>
</tr>
<tr>
<td>5</td>
<td>Collaboration</td>
<td>The individual focuses on coordinating and cooperating with others regarding use of the innovation.</td>
</tr>
<tr>
<td>4</td>
<td>Consequence</td>
<td>The innovation focuses on the innovation’s impact on their immediate sphere of influence.</td>
</tr>
<tr>
<td>3</td>
<td>Management</td>
<td>The individual focuses on the processes and task of using the innovation. Issues related to efficiency, organizing, managing, and successful functioning of the innovation dominate.</td>
</tr>
<tr>
<td>2</td>
<td>Personal</td>
<td>The individual is uncertain about the demands of the innovation and his/her/their adequacy to meet those demands. The individual is analyzing their financial or status implications of the innovation and the implications of the innovation on their personal situation.</td>
</tr>
<tr>
<td>1</td>
<td>Informational</td>
<td>The individual is generally aware of the innovation and is interested in learning about it. Interest is confined to the general characteristics, effects, and requirements.</td>
</tr>
<tr>
<td>0</td>
<td>Unconcerned</td>
<td>The individual indicates little concern about the innovation or is unaware of it.</td>
</tr>
</tbody>
</table>

Note. Adapted from George, Hall, and Stiegelbauer (2006).

A user’s initial concerns about a new technique or tool are focused on their own use or the self. In Self stages, individuals are concerned about their awareness of a technique, how its adoption impacts them personally, and whether they have the ability and means to successfully adopt. The next stage deals with learning to successfully use the new processes, or the task. In this stage, challenges and frustrations may occur as people learn to use a new technique or tool. The final set of stages, Impact, are characterized by technique mastery and an outward shift of perspective towards understanding how the technique impacts a user’s immediate sphere of influence and their ability to share the technique with others and make improvements to the technique itself.

CBAM theorists believed they identified “a developmental process of [the necessity] easing earlier concerns before later concerns are developed” (George et al., 2006, p. 8). They found the resolution of concerns along the stages of adoption holds true for most process- and product- innovations. Extending CBAM from education to agriculture would follow a similar process. Project leaders would identify farmers’ concerns, then categorize them into Stages of Concern, moving from unconcerned all the way to refocusing experiences, along the adoption continuum.

Given the conceptual and theoretical frameworks above, and the SVVC project’s participatory approach, this study used CBAM theories to assess Cambodian farmers’ adoption of PGS. Reflection and assessment are also embedded in CBAM’s SOC. The CBAM suggests...
change is a process that has predictable stages as individuals try to adopt innovations within social contexts. The CBAM SOC may offer international agriculture development practitioners a tool to classify the progress of farmers in the adoption of an innovation.

**Purpose and Research Objectives**

The purpose of this study was to explore the potential of the Concerns-based Adoption Model (CBAM) as a tool to enhance the adoption of agricultural innovations. Specifically, the research objectives were to: (a) adapt and pilot the CBAM Stages of Concern (SOC) instrument to an agriculture innovation context and (b) determine if CBAM’s classification system is a useful tool for international development projects.

**Methods**

The CBAM manual prescribes the CBAM methodology, survey tools, and analysis frameworks (Hall et al., 1973). Guided by this manual, the SOC instrument was adapted to assess farmers’ concerns about the Participatory Guarantee System (PGS) and included two sections: the SOC questionnaire and open-ended questions. In the SOC questionnaire, a series of statements were presented to respondents where each statement corresponded with one of the Stages of Concern. These statements were adapted to align with the expressions of typical expressions of concern identified in CBAM literature (Cashman, 1990; George et al., 2006). For each statement, respondents ranked their level of agreement on a Likert-type scale from zero to seven where zero indicated that the statement was “irrelevant” to the respondent and seven indicated that it was “very true”. Open-ended questions were used to validate the SOC responses and provide additional context. Surveys and interview questions were translated and administered in Khmer (Table 2).

<table>
<thead>
<tr>
<th>Table 2</th>
<th><em>Expressions of Concern about the Participatory Guarantee System (PGS) prior to translation</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage of Concern</td>
<td>Expressions of Concern</td>
</tr>
<tr>
<td>6</td>
<td>Refocusing</td>
</tr>
<tr>
<td>5</td>
<td>Collaboration</td>
</tr>
<tr>
<td>4</td>
<td>Consequence</td>
</tr>
<tr>
<td>3</td>
<td>Management</td>
</tr>
<tr>
<td>2</td>
<td>Personal</td>
</tr>
<tr>
<td>1</td>
<td>Informational</td>
</tr>
<tr>
<td>0</td>
<td>Unconcerned</td>
</tr>
</tbody>
</table>
Survey respondents were selected based on past and current involvement with SVVC. Given time and resource limitations, respondents came from groups of farmers with varying levels of experience and exposure to PGS to represent the maximum number of predicted SOCs as possible. The adapted CBAM SOC questionnaires were administered to a selection of farmers \((n = 76)\) from the SVVC project target regions of Kandal and Battambang. Kandal farmers who participated in PGS were surveyed \((n = 15)\), as well as a comparable group of farmers who live in the same community as the PGS-users but did not use PGS \((n = 16)\). Battambang farmers \((n = 30)\) from the SVVC-supported cooperative were selected to assess their interest in PGS. The final group, also from Battambang, had participated in a PGS training \((n = 15)\).

Stage of Concern data were analyzed at the individual- and group-level, according to the CBAM SOC manual (George et al., 2006). Each question in the SOC questionnaire corresponded to a particular stage. At the individual-level, mean scores for questions of the same Stage were calculated, resulting in a relative intensity score (zero to seven) for each stage. A high relative-intensity score indicated that a participant’s concerns aligned more closely with a given stage, while a low score did not. At the group level, mean relative intensity scores were calculated for each of the four sample populations.

Qualitative data from open-ended questions were analyzed using content analysis and analytic induction (Merriam, 2009). Composite SOC scores for each respondent were generated from the raw Stage of Concern data and the open-ended survey data. As discussed in more detail in the findings, the SOC scores and qualitative survey responses were cross-referenced to develop a full understanding of the adoption process, and farmers’ concerns about PGS.

Validity and reliability were approached by designing the study to allow for cross-checking, and by triangulation between the SOC scores and qualitative survey questions (Merriam 2003). Surveys were reviewed for content validity by experts in survey design, education, and agriculture. Survey drafts were piloted with an initial test group for face and content validity and consistency. Reliability was analyzed using Cronbach’s alpha, understanding the critiques and limitations of this method (Cronbach, 1951; Tavakol & Dennick, 2011). Cronbach’s alpha scores between 0.70 – 0.95 are considered ideal for group uniformity (Tavakol & Dennick, 2011), and all SOCs scored within this range.

Results

Stage of Concern Survey Tool Adaptation

The Concerns Based Adoption Model (CBMA) framework and Stage of Concern (SOC) tool proved adaptable from the education to the agriculture setting for measuring innovations. Questions were adjusted to fit a farmer’s context; however, re-wording the questions was a challenge, given the level of nuance between the questions associated with each stage and the need for translation. Through analysis of the raw Stage of Concern scores, we found that participants who did not have experience with the Participatory Guarantee System (PGS) responded positively to statements aligned to the Consequence and Collaboration stages that normally represent individuals who actively used the innovation and were beginning to think about how it is impacting them, and how to work with others. For example, some of the farmers from the Battambang, No Training group who had never been introduced to PGS scored highly in the Impact stage.

To address this, modifications were made to the processing of the raw Stage of Concern scores. The standard CBAM SOC model assigns users with a particular Stage of Concern by ranking their top two relative intensity scores (George et al., 2006). The user’s lowest intensity
score is also used to give a better understanding, to identify where that individual might be in the adoption process (George et al., 2006). We followed a similar procedure but also included the results of the open-ended survey questions to generate a composite Stage of Concern Score for each individual. By doing so, we corrected for some of the survey word choice issues that resulted in farmers who did not yet have experience with PGS to similarly give high rankings to both the Self and Impact stages. In the case where an individual who had not used PGS scored the Consequence stage highest and the Personal score the second highest, the composite score was adjusted downward to the Personal stage to generate the composite score. All adjustments were cross-referenced with open-ended survey responses to ensure that verbal responses aligned with the overall expressions of concern rubric for each Stage of Concern category.

Feedback from enumerators about the survey process was also documented as a way to assess the revised SOC tool. Lead enumerators who translated the survey noted that the Stage of Concern questions were challenging to translate into Khmer due to their level of nuance and complicated sentence structure. This remained a challenge, even after streamlining some questions for clarity and simplicity. To clarify the translated survey with enumerators, lead enumerators organized a full-day training to discuss each question and practice survey administration. Following the training, enumerators said they felt more confident in understanding the questions. While most of the enumerators had not administered a Likert-type questionnaire before, they noted it was fairly easy to use. Enumerators also noted that farmers with limited exposure to PGS, such as the Kandal, Non-PGS farmers, had trouble understanding the Stage of Concern questions, but were more comfortable answering open-ended questions. However, given these documented challenges with the process of adapting CBAM, the resulting Stage of Concern data aligned with expectations.

Relative Intensity Scores

In the Stage of Concern survey, farmers responded to a series of questions. Each correlated to one SOC on a scale from zero to seven with zero representing “irrelevant”, and seven “very true”. Responses were then grouped by SOC category and averaged for each individual as well as each group of farmers. The average scores of each stage represent the relative intensity of a particular individual or group. Higher relative intensity scores denoted a strong positive response to that stage while low relative intensity scores indicate a low association with that stage (Table 3).

<table>
<thead>
<tr>
<th>Table 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stage of Concern relative intensity scores for all farmer groups</strong></td>
</tr>
<tr>
<td><strong>Stages of Concern</strong></td>
</tr>
<tr>
<td>Unconcerned</td>
</tr>
<tr>
<td>Informational</td>
</tr>
<tr>
<td>Personal</td>
</tr>
<tr>
<td>Management</td>
</tr>
<tr>
<td>Consequence</td>
</tr>
<tr>
<td>Collaboration</td>
</tr>
</tbody>
</table>
Refocusing | 1.72 | 4.06 | 0.25 | 5.17 | 1.70

### Composite Stage of Concern Scores

The composite SOC score aimed to present a clear picture of the respondents’ stages by taking into consideration both the raw SOC scores and the open-ended survey questions. We illustrate the distribution of survey respondents across the SOC grouped by location and experience with PGS (Figure 1).

#### Figure 1. Stage of Concern Composite Scores for Each Farmer Group

#### Stage of Concern Scores

Overall, the findings from adapting and piloting the CPGS BAM SOC were consistent with each group’s level of exposure to PGS. The most experienced PGS farmers had higher relative intensity scores for the Impact stages which are typically associated with more advanced use of a new innovation. Conversely, those farmers with less exposure to the PGS aligned more
closely to the Unconcerned and Self stages which characterize individuals who are either uninterested in the innovation or would like to know more about it.

The SOC scores (Table 3 and Figure 1) demonstrate support for the concept that farmers move through a series of adoption stages, and that the tool was effective at identifying SOC. We compared and contrasted all survey groups that did not use PGS. For example, Battambang, No Training, and Kandal, Non-PGS groups followed a similar pattern of high relative intensity scores for the Unconcerned, Informational, and Personal stages followed by a declining response to the remaining stages (Figure 1). The highest relative intensity score in the Kandal, Non-PGS group was the Personal stage, which aligns with their level of exposure to PGS. Most farmers cited their lack of knowledge and experience as the primary concern. “No one has asked me to join” and “no one has introduced PGS to me” were frequent statements. Because these farmers live in close proximity to the Kandal, PGS farmers, the non-users had the opportunity to learn about PGS and expressed high readiness and interest in continuing to learn. Many expressed they would like to participate in the PGS because there were “stable prices”, while others were concerned that there were “high requirements and a lot of labor.” While the Battambang, No Training group followed a similar pattern to the Kandal, Non-PGS group, the Battambang farmers had lower relative intensity scores in the Self stages compared to Kandal, and the Battambang farmers equally ranked the Informational and Personal. This is consistent with the fact that the Battambang, No Training farmers had not heard of PGS prior to the survey. Additionally, more farmers in this group ranked the Unconcerned stage higher than the Kandal, Non-PGS farmers. Given that most of Battambang horticulture cooperative members decided not to pursue PGS, this finding is consistent with expectations. Even though Battambang, No Training farmers had less exposure to PGS than Kandal, Non-PGS farmers, the Battambang farmers ranked the Collaboration stage the highest among all non-PGS users. Some of these farmers had much higher Impact relative intensity scores compared to the Self stages that could not be explained by survey wording issues alone. The Battambang cooperative had more exposure and alternative marketing systems and advanced production tools and techniques as well as a deeper understanding of quality standards. Some individuals in this group may have responded to the survey based on their existing knowledge of those techniques rather than PGS. As such, farmers were primed to share knowledge gained through projects and activities to which they had previously been exposed. They were likely considering use of their existing marketing program, and this was confirmed via open-ended survey data. For example, even though these farmers had not yet been introduced to PGS, many farmers in this group indicated they wanted to “expand their use of PGS” because “they are getting higher prices for the marketing standards.”

The Battambang, With Training, Users had high Impact stage scores. This was a surprise because these stages are usually associated with individuals who used PGS for some time and were comfortable with a technique, wanting to share knowledge with others, and to improve the system itself. This may be explained due to the similarity of statements related to the Personal and Consequence stages. As established in the CBAM framework, Personal stages statements were crafted to align with individuals contemplating “how PGS will impact me,” while Consequence stage statements model the idea “how PGS is impacting me.” Additionally, after receiving training in PGS, farmers may have felt competent enough to share what they had learned with others even though they had not yet practiced PGS themselves. This may explain the high Collaboration stage scores.
Concerns-based Adoption Model for Project Management

To assess the potential of the efficacy of CBAM as a project management tool, feedback was gathered from SVVC project administrators about their experiences during the CBAM survey process. In an interview, administrators noted that the CBAM survey informed them about the concerns of project participants (LeGrand & Buntong personal communication, January 31, 2019). The method helped them identify farmers who were ready to try PGS, as well as those that either did not wish to join or might need more time to consider the guarantee system. CBAM also gave the SVVC project administrators an understanding of the stages that existing users experienced as they adopted PGS, as well as their past and present challenges using the PGS.

Conclusions

Adapting and Piloting the Stage of Concern Survey Tool

The survey itself was easy to adapt from the educational to the agricultural context. Survey findings indicate the need to consider social context while acknowledging group dynamics, and compatibility as found in the theories of Lewin (1947) and Rogers (2003). In one case, the leaders of a farmers’ cooperative made a decision not to use PGS, but the CBAM survey identified individual farmers wanting to learn more about PGS. This demonstrates the functionality of the SOC and how the adaptation of the SOC questionnaire to an agriculture innovation can provide tools to actualize adoption.

While adapting the tool for the PGS innovation was not complicated, some challenges arose in simplifying the wording to ease translation, while also preserving the intent of each question. This phenomenon is not unique to the Stage of Concern tool and is common in most situations when working across languages (Brislin, 1970; Hennink, 2008; Merriam, 2009). Like most surveys, the SOC tool was designed to repeat items in different ways to ensure validity and reliability. Similar questions were asked that corresponded to each stage, and these questions had very subtle differences, which proved to be difficult to translate in a field-based research setting. There are several possible reasons that this was a challenge, ranging from the differences between Khmer and English languages; the unfamiliarity of farmers with surveys and PGS; and the educational differences between farmers and enumerators.

As with most research, having multiple sources of data gives greater confidence in the findings. In the only other study that used CBAM in an agricultural context (Cashman,1990), the researcher only used open-ended questions, which were adapted from the SOC survey to gather data, which was in contrast to the Likert-style survey approach presented in the CBAM manual (Cashman, 1990; George et al., 2006). We found using both the SOC survey and open-ended interview questions allowed for triangulation of our findings.

All technological introductions involve learning and change at the individual level. The findings of this study showed the adapted SOC tool was effective at placing people into the appropriate SOC category along the adoption process. The concerns expressed by farmers aligned with the Stage of Concern findings and support the effectiveness of the tool. These concerns also provide context and direction for project professionals to target support to program participants across each of the SOC. The SOC also has potential to be a tool to document outcomes of participatory projects and promote lasting results.

Recommendations

Given the fact that enumerators in agricultural development projects are often college-
aged and often have limited English skills, it was not surprising that translation was a challenge. To overcome translation and wording nuances between stages, we recommend surveys be piloted multiple times with enumerators to ensure full comprehension, and to help improve the accuracy of translation. This requires resources and time which can be a challenge in development projects; but, ultimately, investments are worth the return in terms of accurate data.

We recommend conducting further research to determine the efficacy of CBAM and the SOC in more agricultural contexts. If findings are positive and this methodology was integrated into development projects, like in this study, the CBAM SOC survey could be used as a tool to achieve greater adoption and improve learning outcomes through the use of reflection and the development of agricultural communities of practice. The full CBAM framework, including the Innovation Configuration Map and the Levels of Use, were not tested by our study but could be analyzed for their potential to serve as a tool for agricultural development projects to elicit behavior change through a participatory framework.

Adoption researchers extensively note that change is a process that occurs over time, but donors frequently require immediate and tangible results. CBAM could be used as evidence of change as project beneficiaries move across the SOC. However, when using CBAM, development practitioners and their donors must be prepared and open to accept all possible survey results, including the possibility that an innovation might not be welcome or appropriate at a given time or to target beneficiaries. As noted by Rogers (2003), compatibility is one of the interconnected variables that determine the success of adoption. Practitioners need to have a willingness to be responsive to the community and return to the design phase if an innovation is not compatible.

**Implications**

Agricultural development project teams are frequently tasked with reaching large numbers of people with objectives to train them in the same series of innovations constructed by donors and program administrators. This project design is contradictory to the learning and change theories which note that individuals move through the learning and adoption processes on an individual level (Baker, Robinson, & Kolb, 2012; Dewey 1938; Hall et al., 1973; Kolb, 1984). Development practitioners benefit from understanding that people go through stages as they adopt technologies or new processes, and that adopters do this at different rates and at different times, particularly in the critical Personal and Management stages within the SOC. When project implementers use CBAM SOC, they become aware of the stages project beneficiaries are in. Knowing this, project leaders can focus on activities that promote lasting adoption and strategically communicate the innovation and thereby, ensure the needs of each farmer are met at the right time (Moyo & Salawu, 2017). Restructuring a project in this way can save time and money. Resources are not wasted training farmers who will not adopt an innovation due to incompatibilities with current agricultural systems or societal frameworks. Furthermore, resources can be targeted at tailoring training for those who share similar situations, skills, and needs, thereby enhancing successful adoption.

Project monitoring and evaluation can be strengthened with the CBAM SOC tool. Practitioners are increasingly expected to demonstrate evidence-based impacts in the short lifespan of an agriculture development project (Mansuri & Roa, 2003). As change and adoption of a new innovation is an ongoing process, it can be difficult for project leaders to quickly demonstrate results. A common failure of participatory projects is that project time-frames are too short to include participatory practices (Chambers, 1994). For projects that aim to be
participatory, there is a need for tools that demonstrate incremental change (Ticehurst & Cameron, 2000). If used periodically throughout a project, the CBAM SOC would document trainees’ adoption over time and serve as evidence to donors that progress is taking place. CBAM can also be an ongoing monitoring tool and feedback mechanism for participatory projects, providing additional methods, while also serving a particular niche for participatory project management by focusing on learning and adoption.

References


Lived Experiences during International Service Learning: A Semiotic Analysis of Photo Journals

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Abstract
International service learning (ISL) is a pedagogical approach used to prepare students to be global citizens and has emerged as a popular short-term program model for international experiences. Few studies of ISL have integrated semiotic photo analysis into their evaluations. Combining students’ photographs with text encourages reflection on knowledge and experiences as well as how they are related. The current study used semiotic analysis to understand the lived experiences of students on an ISL to Guatemala. The participatory nature of the research process was critical to the semiotic analysis, as the researchers had an understanding of the cultural perspectives and traditions that emerged in the images which could have been overlooked by a researcher without knowledge of the specific cultural context. Participants kept a photo journal of 10 images and associated narratives to depict their experiences on the ISL. Both semiotic and content analysis were conducted on each journal entry. Coding yielded nine themes: new perspectives, personal connections, impact of coffee, intercultural comparisons, reality of life in Guatemala, cultural values, impact of ISL, connection to photograph, and sense of place. Combining the semiotic and content analysis yielded concurrent meanings through narrative and visual reflections, which, when combined with the researchers’ participatory knowledge of the experience, informed future ISL projects for the research and teaching team. The combination of visual and narrative methods required students to think about what story they will tell about their experience, and brings new layers of meaning to the reflection process.

Keywords: photo-based methods, experiential education, educational evaluation, Guatemala

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Introduction

As significant shifts occur in the pedagogy of higher education, research methodology, and community development, civic engagement and experiential learning are highly valued as holistic educational processes toward sustainable social change (Peterson, 2009). Short-term international program models have increased in popularity with students interested in international experiences (Bunch, Rampold, Cater, & Blackburn, 2018). International service learning (ISL) is a pedagogical approach used to prepare students to be global citizens (Bringle & Hatcher, 2011) that has emerged as a popular short-term program model for international experiences (Bunch et al., 2018). The nexus of ISL, cross-cultural interactions, and agriculture allows students to examine, dissect, and understand the complex relationship between the social and natural sciences (Roberts, Raulerson, Telg, Harder, & Stedman, 2019). Reflective journaling is often used during ISL experiences to solidify participants’ concrete experiences during the ISL, an experiential learning environment, into learning and knowledge creation (Kolb, 1984; Roberts et al., 2019). Reflection also allows participants to critically examine their experiences during ISL (Roberts et al., 2019).

Visual methodologies are a relatively new analysis procedure in a majority of disciplines (Glaw, Inder, Kable, & Hazelton, 2017). Many studies have evaluated ISL experiences through examining emotion, cognition, and learning style (Hains, Ricketts, & Tubbs, 2012; Lamm, Cannon, Roberts, Irani, Unruh Snyder, Bredemuhl, & Rodriguez, 2011), and other studies have utilized photonarrative methods in their ISL evaluations (Bost & Wingenbach, 2018; Dobbins, Dooley, & Edgar, 2019; Homeyer, Leggette, McKim, & Walker, 2017; Uscanga, Edwards, & Watters, 2019). However, a review of literature found no ISL experiences that integrated semiotics into their photo analysis process. Bost and Wingenbach (2018) used a semiotics framework to analyze the effects of the photo narrative process on students’ intercultural learning, but the current study differs by using semiotic analysis to understand the lived experiences of students on an ISL to Guatemala. Examining photo journals through semiotic analysis may allow researchers to better understand the lived experiences of students on an ISL because traditional qualitative methods, such as coding, may not bring to light the entire experience of the students.

Though many of the photo-based methodologies emerged as a way to “deep[en] the understanding of select marginalized groups” (Borron, 2013, p. 6), these methodologies can play a role in understanding the cultural impact of students who participate in ISL as they experience cross-cultural experiences. Photo-based methods also allow participants to focus their experiences in light of the culture in which they experience this impact, and to highlight those relationships that emerged through the process. The interpretation of images through photo-based or visual methodologies allows researchers to reveal deeper layers of meaning in the analysis process (Glaw et al., 2017).

Literature Review

ISL, which began in U.S. universities in the 1990s (Bringle & Hatcher, 2011), combined the idea of service-learning with an international setting (Ash & Clayton, 2004). In the broadest sense, service-learning involves community service and learning activities. Dewey (1986) proposed service learning as distinguished from other types of learning because it includes experiential learning, reflection, and reciprocal learning. Literature suggests ISL has the opportunity to enhance undergraduate and graduate students’ experiences abroad, by enhancing their intercultural competency (Kohlbry, 2016), changing students’ worldviews (Kiely, 2004),
and making students feel as if they are part of the solution to global problems rather than a contributor to them (Niehaus & Crain, 2013). Moreover, ISL may also benefit students in agricultural contexts. Roberts and Edwards (2016) investigated university agriculture students participating in an ISL and their lived experiences and found “students’ cross-cultural knowledge and understandings became more complex” (p. 17).

Photo-based methods are used as a research tool in many fields, such as health care (Newman, 2010), natural resource management (Beckley, Stedman, Wallace, & Ambard, 2007), and education (Goldston & Nichols, 2009). Bost and Wingenbach (2018) found photo-based methods “have immense educational value and potential as tools to impact students’ ethnorelative worldviews” (p. 96). Examples of photo-based methods include photovoice and photo journal (Bost & Wingenbach, 2018; Madden & Dell’Angelo, 2016).

Photo journals, which often include photos and text, provide students the opportunity to reflect on their learning and share experiences through their own perspectives (Madden & Dell’Angelo, 2016). Research indicates that by combining students’ photographs with text encourages reflection on knowledge and experiences as well as how they are related (Madden & Dell’Angelo, 2016). Photo journals are derived from photovoice (Wang & Burris, 1997) and are similar in concept and application to photonarrative (Bost & Wingenbach, 2018). Madden and Dell’Angelo (2016) found students who created reflective photo journal entries “developed an understanding for how that content was connected and coordinated to a bigger picture” (p. 27). Edgar and Rutherford (2012) described the importance of analyzing both text and photos in order to understand the entire context of a message. Photo journals may be particularly useful in understanding students lived experiences during ISL experiences in that students must distill their experiences through these photographs to symbolize the most impactful moments of the opportunity.

**Theoretical Framework**

Semiotics, in the broadest sense, is “the study of signs” (Chandler, 2007, p. 2). Individuals are constantly surrounded by signs within images, actions, and words that must be decoded (Saussaure, 1959). Semiotics involves the signs mentioned in everyday speech as well as anything that may stand for something else (Chandler, 2007). In simple terms, an object is considered a sign if it has “meaning beyond the object itself” (Edgar & Rutherford, 2012, p. 17). Images may contain sign relations that help characterize meaning and analysis within an image or photograph (Edgar & Rutherford, 2012). Edgar and Rutherford (2012) noted semiotics quantifies the meaning of an image via visual content analysis, and explained “semiotic methodology is used to provide researchers with information about the content of images and provide an understanding of how the audience would interpret the image and the effect it could have on building perceptions” (p. 18).

There are three types of signs in semiotic theory: iconic, indexical, and symbolic (Peirce, 1931-58). Iconic signs, or icons, are similar in resemblance to what they represent. For example, an icon may be the drawing of the gender of a person allowed in a bathroom. The most common example of icons are photographs that are purposely used as a representation of what they are depicting (Lester, 2006). However, icons do not have to be visual (Chandler, 2007). Indexical signs have a logical association with what they represent. For example, a photograph of a smokestack emitting large amounts of smoke represents pollution (Lester, 2006). Another example examined by Peirce is a sundial or clock because they indicate time (Chandler, 2007). Typically, it may take longer to interpret an indexical sign than an iconic sign. Symbolic signs
are abstract and do not have a logical connection with what they represent. For example, symbols may be “words, numbers, colors, gestures, flags, costumes, most company logos, music, and religious images” (Lester, 2006, p. 58). Unlike icons and indexical signs, symbols must be taught, which creates a heavy social and cultural influence on them. Considering symbols are culturally and socially imbedded, they are typically passed on from generations and include more emotions from viewers than iconic or indexical signs (Lester, 2006).

**Purpose and Research Questions**

The purpose of this study was to understand the lived experiences of participants on an ISL to Guatemala. The research questions that guided this study were: a) What themes emerged from the narratives associated with each journal?; b) What iconic, indexical, and symbolic characteristics emerged from the photographs?; and c) What story do the four photo journals tell about participants’ experiences during the ISL?

**Methods**

The present study employed qualitative content analysis methods based on semiotic theory to analyze photographs from student photo journals during an ISL to Guatemala. Four students who applied were selected for the ISL from a Higher Education Challenge grant-funded graduate course, *Global Horticulture and Human Nutrition to Enhance Community Resilience and Food Security*. Students completed the coursework prior to the ISL. This line of inquiry followed a participatory methodology and research design, as the researchers used their contextual knowledge through participatory observation with the participants to emphasize the voices of those being studied through the research process (Steinberg, Bringle, & McGuire, 2013). Autophotography, an ethnographic research methodology in which the researcher and reader view data through the participant’s view through photography (Glaw et al., 2017), also guided the research design.

Participants kept a photo journal of 10 photos and associated narratives to depict their experiences on the ISL. The purpose of the photo journals was to allow students to reflect and tell a story through pictures and narratives about their international experience. Both semiotic and narrative content analysis were conducted on each journal. The semiotic analysis was conducted in two phases for each photograph: (a) identifying the iconic, indexical, and symbolic characteristics of each photograph, and (b) identifying the connotative (positive, negative, neutral) tone of each photograph. The content analysis consisted of identifying the emerging themes within the associated narratives and the connotative associations within each narrative. This project maintained inter-coder reliability through a comparative assessment of all 40 images in which two researchers independently coded for semiotic characteristics in each photograph and then compared the identified characteristics to ensure holistic capture of the iconic, symbolic, and indexical characteristics in each image. Two photographs were selected for results presentation from each of the students’ photojournals. The selection of these images were based on the criteria of capturing a significant moment for the students while in country, the ability of the photograph to be anonymized for privacy, and the relation of the photograph to the students’ graduate studies.

One researcher spoke Spanish, which led to contextual differences in the analysis process. One participant also spoke Spanish and had family who was Guatemalan, which influenced his experience and subsequent reflection. The participatory nature of the research process was critical to the semiotic analysis, as the researchers had an understanding of the
cultural perspectives and traditions that emerged in the photographs which would have been overlooked by a researcher without knowledge of the specific cultural context required for some of the coding process. The researchers gained this cultural perspective to guide data analysis by traveling with the participants in country. This yielded richer analyses of the photographs and the narratives through semiotic and content analysis.

Results

The dual analyses from the photographs and the narratives revealed impactful moments from the participants’ perspective about the ISL. The research questions were discussed in relation to the relevant findings for each question. The first section describes the emergent themes from the narratives. The following section contains the results for the first and second research questions, as the iconic, indexical, and symbolic characteristics are discussed in relation to the story each participant told in their journal.

Emergent Themes from Photo Journal Narratives

The participatory nature of the research process was critical to the semiotic analysis, as the researchers had an understanding of the cultural perspectives and traditions that emerged in the images which could have been overlooked by a researcher without knowledge of the specific cultural context. The narratives with each image were analyzed separately from the image. Coding occurred using MAXQDA and yielded nine themes: new perspectives, personal connections, impact of coffee, intercultural comparisons, reality of life in Guatemala, cultural values, impact of ISL, connection to photograph, and sense of place. These themes were developed from 71 initial codes.

Semiotic Characteristics and Participants’ Stories

The semiotic analysis revealed varied layers of meaning in each image. This analysis revealed how four students perceived the same experiences differently, as well as the most impactful moments for each participant on the trip. Table 1 contains the semiotic characteristic for each figure presented in this section to view simultaneously with the narrative analysis. To emphasize the individual experiences of each participant, the individual participants’ photo journals are discussed together as a narrative integrating the emergent themes from each participants’ photograph.

Table 1

<table>
<thead>
<tr>
<th>Figure</th>
<th>Iconic</th>
<th>Symbolic</th>
<th>Indexical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1</td>
<td>Man holding photograph and packaged coffee, strainer in background, table, bowl</td>
<td>Different packaging shows evolution of cooperative over time, impact of ECG, more opportunities for markets through different packaging</td>
<td>Man holding before photograph of self—growth, progression, change</td>
</tr>
<tr>
<td>Figure 2</td>
<td>Packaged coffee, English words, rice and beans, table, hands, pen, paper</td>
<td>English words indicate that its marketed outside Guatemala, old logo indicates change/evolution/progress</td>
<td>Packaged coffee for sale/export</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
<td>Interpretation</td>
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<td>--------</td>
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<tr>
<td>Figure 3</td>
<td>Leaves, plants, sticks, dirt, red fruit, basket, shirt</td>
<td>Red coffee berries mean they are ripe, harvest yields financial gain, experiences of Guatemalan coffee farmer with harvest basket. Collecting fruit indicates a harvest.</td>
<td></td>
</tr>
<tr>
<td>Figure 4</td>
<td>Eight people, chairs, man pouring beverage, chairs, people sitting, concrete structure</td>
<td>ECG farmer sharing his commodity with guests, concrete porch signals financial prosperity, shirt indicates he is part of an organization or business, tourism. Coffee tasting, skin color of guests could indicate they are visitors.</td>
<td></td>
</tr>
<tr>
<td>Figure 5</td>
<td>Yellow wall, sign with woman in a yellow shirt, Spanish words, container with bullets</td>
<td>Mayan symbol of cultural heritage, machismo, bullets from ex-Guerrilla fighters in the household, non-traditional gender roles, written in Spanish instead of Mayan which was spoken in the household. The sign is a form of art.</td>
<td></td>
</tr>
<tr>
<td>Figure 6</td>
<td>Man gesturing, tablecloth, tools in background, coffee maker</td>
<td>Man conversing with someone, machetes in the background represent his war-torn past, coffee machine represents their new purpose and something to share with guests. Talking indicates someone is listening, engaging in reciprocal conversation.</td>
<td></td>
</tr>
<tr>
<td>Figure 7</td>
<td>Trees, vegetation, landscape, blue sky, clouds</td>
<td>Beauty of Guatemalan landscape, coffee as part of landscape and beauty, integrated naturally. Coffee plants, blue sky means clear day.</td>
<td></td>
</tr>
<tr>
<td>Figure 8</td>
<td>Flower on plant, green fruit, brush on ground</td>
<td>Blossoming coffee flower signals economic prosperity. Coffee plant, flower blossom means that the plant is producing, economic prosperity.</td>
<td></td>
</tr>
</tbody>
</table>

Sparky, an agricultural education student, framed each photo journal entry as a chapter in his experience, choosing to highlight the relationships built and the impact of coffee. General semiotic characteristics for his images included notions of change, exchange, evolution, and bonding.

Sparky’s photograph (Figure 1) represented the theme of connection to photograph, when he described “what [he] liked about the picture.” It also primarily related to the impact of coffee theme, as he described the evolution of the cooperative and the economic prosperity experienced by Mario. Sparky explained how one can see the beginning of the first cooperative, and “then we see [Mario] in the present with his various […] micro-lots and blends. He has been able to thrive off of coffee and has rolled with the many changes […] throughout these years.”
Sparky discussed the concept of change, stating that he believed this photograph “exemplified change,” which you could even see “in [Mario’s] expression between the two pictures.” Table 1 shows the symbolic characteristics in the photograph, which connect to Sparky’s reflection on change. The indexical characteristics also related to growth, progression, and change, but showing a man holding a before and after photograph of himself.

This photograph (Figure 2) also represented Sparky’s reflection on the concept of change, in which he connected this concept beyond change in the cooperative to personal change. This related to the theme, personal connections. Sparky stated, “I focused a lot on change during this trip,” and directly connected his experiences during the trip to the changes that occurred within the cooperative—“because of this bag of coffee […], I was able to experience Guatemala and its coffee industry. I thought this was a unique moment to catch a glimpse of what the farmers started with and what they are now.” Again, Sparky evoked the theme impact of coffee on the lives of the farmers in the cooperative, in addition to discussing the impact of ISL, when he stated that he is interested not only in the impact of coffee, but also in learning about people’s personal histories and paths to get to where they are today. The symbolic and indexical characteristics of Figure 2 related to marketing, growth, expansion, and export, which coincided with Sparky’s meaning behind the photograph explained in the narrative.

Tony, a horticultural student, focused his images on cultural artifacts, coffee and the coffee plant, and personal interactions. The general semiotic characteristics for his images included financial gain, travel, cultural intersections and interactions, cultivation, and juxtaposition.

Figure 3 demonstrated, along with Tony’s reflective narrative, the theme new perspectives. He stated, “getting a taste of the harvesting process of coffee put into perspective all the hard work that the farmers go through in order to have high quality coffee.” He discussed how, as visitors, they had the easy job of only harvesting a few trees with fruit, rather than hiking up a volcano to harvest, and hiking back down carrying 100 pounds on their backs. His new perspective was understanding just “how much work goes into enjoying a quality cup of coffee.” He reemphasized this point by saying: “I will never look at coffee the same again, I will make sure to buy quality coffee with a known origin. This will ensure I am helping farmers directly and not buying the overpriced and lower quality supermarket coffee.” Tony’s reflective narrative indicated an intended behavior change in response to experiences on the ISL, further elaborating
upon the impact of ISL theme. Semiotic characteristics from Table 1 for Figure 3 included harvesting of coffee fruit yielding financial gains, and seeing a Guatemalan coffee farmer with the coffee basket connected to Tony’s reflection on the hard work that goes into crafting one cup of quality coffee.

Figure 2. Titled: “It All Starts Somewhere”.

Figure 3. Photograph from Tony’s journal.

Tony’s selected image of a farmer “proudly serving us a cup of his own coffee” (Figure 4) demonstrates the intimacy of growing coffee from seed to cup. He described how Gonzalo (the farmer) served this coffee after a hike up a volcano to his field, where the participants
harvested cherries, then returned to Gonzalo’s home where they learned how to roast and grind the coffee beans according to traditional methods. Tony felt that Gonzalo “enjoyed [how] we had nothing but good things to say about [this] delicious cup of coffee.” The personal experience of tracing Gonzalo’s coffee through the production process, and how it connected to Guatemalan traditional coffee culture, helped this horticulturalist see the personal connections between production and culture. Tony himself is of Guatemalan descent, which provided extra nuance to this interaction, and related to the new perspectives theme. He stated that he appreciated “shar[ing] this cup of coffee with the farmer who put his blood, sweat, and tears [into the product] to have us enjoy this high-quality coffee.” The symbolic and indexical characteristics analyzed diverged somewhat from Tony’s narrative (Table 1). While the characteristics yielded concepts of sharing coffee, they also revealed financial prosperity (from Gonzalo’s participation in the organization and the concrete structures in his home), the indexical characteristic about the differing skin tones of the guests was not emergent in Tony’s narrative.

![Figure 4](image-url)

*Figure 4. Photograph from Tony’s journal. Picture blurred to maintain farmer confidentiality.*

Ruth, a student of food science, included many cultural artifacts in her images, as well as images which represented cultural dissonance, such as trash littering the landscape, and bucket showers. These themes were analyzed as cultural values, changing gender roles, financial security, and impact of coffee. She also framed each entry around the community in which it was taken, echoing the sense of place theme.

The image seen in Figure 5 sat on top of a book case at Ruth’s host family’s home. She described how her host family’s home had “bits of feminism sprinkled throughout it.” Her host mom, Ana, a veteran of the Guatemalan civil war, “went from fighting for the indigenous peoples to fight for women’s empowerment and rights in Guatemala.” Ruth reflected how Ana’s activism aligned with many of her own beliefs about the rights of women and the disenfranchised, relating to the intercultural comparisons theme. She was particularly struck by
how Ana’s progressive views juxtaposed Ruth’s previous conceptions of the values of rural Guatemala, a country with a strong tradition and history of “machismo.” The symbolic and indexical characteristics from Table 1 for Figure 5 closely reflected Ruth’s interpretation and meaning for this photograph. However, the juxtaposition noted between the Mayan cultural artifact and the Spanish words in the sign were noted in addition to Ruth’s explanations of gender roles, which demonstrated further the complex history of Guatemala and their relationship with colonialization and modernization both yielding Spanish influences.

Figure 5. From Ruth’s journal. Spanish words in the picture translate to, “in a [chauvinist] system, being a woman represents an act-of-resistance.”

Roberto, Ruth’s host dad, explained how when they moved to this community, “we traded the art of war for the art of coffee.” She reflected again the sense of place theme, by describing the difficulty hearing him over the storm outside from an intense, pounding rain that happened every afternoon in the community. She described Roberto’s infectious passion in the foreground of the photograph, with his machetes in the background—this served as “a reminder of the dark history of many of these farmers [in the community] after the Guatemalan Civil War.” This narrative reflection connects to the theme of reality of life in Guatemala, and the lingering consequences for many of the days during the civil war. Again, in Figure 6 the symbolic and indexical characteristics in Table 1 reflect Ruth’s narrative description and meaning behind the image.

Celia, a horticulture student, depicted images of animals, plants, landscapes, and infrastructure. The semiotic characteristics present in her images included prosperity, financial security, precariousness of coffee farming, and poverty. Celia’s photograph in Figure 7 represents the impact of coffee theme. She explained how, in the image, “the coffee plant is in the foreground representing its importance to the farmers in [the community].” Celia also described how in this particular area, coffee plants are integrated “with the natural environment of the forest,” demonstrating the sense of place. The symbolic characteristics for Figure 7 (Table 1) include the beauty of the Guatemalan landscape with coffee as part of the landscape, reflected in Celia’s narrative.
In this photograph (Figure 8), Celia explained her excitement to see “the coffee plants in different phases of production.” She wanted to demonstrate in her photograph the “diversity of coffee flowering and fruiting.” As a horticultural student, she recognized the impact of coffee and learned about coffee production from the plant to processing. The symbolic and indexical characteristics from Table 1 reflect the idea of a blossom representing a future harvest, which yields economic prosperity for the coffee farmers.
Conclusions, Implications, and Recommendations

Overall, relationships with farmers and the effect of coffee were some of the major impactful experiences indicated in the photo journals. Though only two representative photographs were included for each participant, the narrative analysis of all photo journal entries supported the emergent themes and these conclusions. Participants’ connection to their photographs in their journals were expressed in various ways, through a fond statement about the person or people in the image, about the feelings the photograph reminded them of from the ISL experience, or in how the technical aspects of the image reflected their own emphases and highlighted concepts from the experience.

The confluence of both semiotic and content analysis allowed the researchers to investigate how students crafted their story of the ISL through visual and narrative methods. This process adds to the current literature of methodologies used to understand the lived experiences of students during an ISL (Bost & Wingenbach, 2018; Bunch et al., 2018; Hains et al., 2012; Lamm et al., 2011; Roberts et al., 2019), as traditional qualitative methods, like coding, do not always reveal the comprehensive story of impact and experience. The semiotic analysis allowed researchers to see what images were meaningful for the students and to understand those images and the messages they told about the experience. Combining the semiotic and content analysis yielded concurrent meanings through narrative and visual reflections, which, when combined with the researchers’ participatory knowledge of the experience, informed future ISL projects for the research and teaching team.

Determining new methods for evaluating ISL to better understand the lived experiences of the students is critical for service-learning pedagogy. The combination of visual and narrative methods requires students to think about what story they will tell about their experience, and brings new layers of meaning to the reflection process. The photo journal process allowed students to determine ten images that represent and distill their experience. This benefits the stakeholders of ISL to see how students construct impactful moments, which can be used to modify future ISL by allowing for more activities that facilitated impact and learning. As the photo journal methodology was combined with other methods to evaluate the ISL experiences for each participant, it gave insight to how the participants gave visual meaning to otherwise narrative reflection processes.

This form of engaged pedagogy can help the discipline critically evaluate and reinvent paradigms used for service learning (Peterson, 2009). The participants continually reflected on
the reciprocal relationships formed during this experience, and the interpretive visual meaning provided by the photo journals emphasized the importance of engaging with local knowledge to diversify students’ perspectives to better prepare graduates as global citizens (Bringle & Hatcher, 2011; Peterson, 2009). Daily reflective narratives (reported elsewhere as it was outside of the scope of the current study) helped evaluators capture the essence of the total experience, as well as the minute details which contributed to the overall ISL impact; however, by having participants craft a visual story, they illuminated how they viewed the impactful moments from the trip. It also allowed an opportunity to add depth and richness (Borron, 2013) to the ISL evaluation process by co-constructing the story of the experience through the participants’ perspectives. According to Kahn (2010), few individuals “consider the significance of the visual in teaching and learning, and how visual approaches allow is to teach what culture and global awareness really is” (p. 45). Perhaps researchers should evolve their methods for evaluating ISL to include photo-based methods as a way to educate and communicate with external stakeholders about the impact of their programs. The researchers encourage those involved with leading ISLs to include opportunities for participants to reflect through both written and visual forms to better understand the lived experiences during international travel.

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Prospects and Evaluation of an Integrated Extension Model designed for Anthrax-free Area Development

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Abstract

The main purpose of this study was to assess and evaluate an Integrated Extension Model to improve the overall knowledge, attitude and practice habits of community people over a sustained period. The survey questionnaire results have indicated that the various sources of anthrax message dissemination had played a significant role in the study. Among those responsible for disseminating the information, it was realized that students serving in the role of message disseminators played the most significant role (15%) in delivering the anthrax-related key information to the community. Majority community members (97.5%) were made aware of the nature, occurrence, public health importance, and management of the disease. Their dangerous habits and attitudes toward slaughtering of sick animals were reduced (<30%). The attention of local administration and the law enforcement agency focused distinctively on the issue of animal slaughter. Vaccination and clinical records reveal that the percentage of vaccination coverage was increased from 40% to 85% and the percentage of farmers who can diagnose anthrax has been increased from 30% to 40%. On the other hand, their poor economic background together with the dispersed settlement nature of the farmers was the main gaps identified that continued to force them to slaughter infected animals, sell their products and consequently conceal that information, all issues that are required to be addressed in the future. Based on the research findings, it can be concluded that this model is an efficient, effective and suitable method to raise awareness levels in a large community with regards to a zoonotic disease like anthrax.

Keywords: anthrax, One Health, awareness, Integrated Extension Model, community.
Introduction

Before the development of the vaccine in the 1930s, anthrax was regarded as a disease of major health or economic importance and was the foremost cause of uncontrolled mortality in cattle, sheep, goats, horses, and pigs worldwide. Humans contract the disease directly or indirectly from animals or animal products. Anthrax (popularly known as “Torka” in Bangladesh) is an acute infectious zoonotic disease caused by *Bacillus anthracis*, a soil-borne, spore-forming bacterium (OIE, 2008). The anthrax spore (*i.e.*, in its dormant stage) is resistant to heat and chemical disinfectants, and this dormant stage may persist and remain viable for several decades in the soil (Dragon et al., 2001; Hirsh & Zee, 1999; OIE, 2004). The disease is still enzootic worldwide and *Bacillus anthracis* has always been high on the list of subversive agents for potential use in biological warfare and bioterrorism.

Anthrax naturally occurs in almost all countries in the world; however, the disease is most prevalent in tropical and sub-tropical countries (Biswas et al., 2011). Sporadic occurrence and epizootics of anthrax occur among livestock and wild herbivores in the United States, southern and eastern Europe, and Canada. Outbreaks at the animal-human interface are reported from countries in Africa, the Middle East, and Asia (Islam et al., 2018). In southern Asia, anthrax is considered as highly enzootic – this is the case especially in India and Bangladesh where continual outbreaks occur in both animals and humans (Siddiqui et al., 2012).

In Bangladesh, anthrax has been reported in cattle and humans since 1980, and cases may be reported during any month of the year (FAO/OIE, 2010). In 2008 and 2009, animal anthrax outbreaks were reported from 58 of the 64 districts in the country, and while some districts have outbreaks almost every year, in others the outbreaks may occur only once every five or more years (FAO, 2016). Though animal anthrax has been presumed to be enzootic for long period earlier, in Bangladesh it was recognized as a zoonotic disease during the year 2009–2010 (Ahmed et al., 2010). According to the Department of Livestock Services (DLS), from 2010 to 2016 there was 17,139 anthrax cases reported and 1,268 animals died due to anthrax. Anthrax outbreak is mostly prevalent in Sirajganj and nearby districts (Ahmed et al., 2010; Biswas et al., 2011). Along with animal infections, more than 600 people have been diagnosed with anthrax in Bangladesh until the year 2011 (Fasanella et al., 2012). Favorable environmental conditions such as soil pH, calcium content, moisture, soil type, high ambient temperature and rainfall and topography positively correlated with the persistence of anthrax spores and the subsequent outbreaks of anthrax (Ahsan et al., 2013; Hugh-Jones, 2002; Van Ness, 1971).

After the analysis of every previous human anthrax outbreak in Bangladesh, it was observed that the outbreaks occurred due to the slaughtering of sick or moribund animals, presence at the slaughtering site, and the handling of raw meat and meat products (HSB, 2009; Samad & Hoque, 1986). Studies identified that most of the people in anthrax prone area were not well informed about the potential transmission of infections from sick animals to humans. Poor awareness level, lack of efficacy of anthrax treatment of humans, and inadequate vaccination program in livestock, improper washing of grass before feeding of animals, slaughtering of moribund cattle, and selling flesh of cattle that died of unknown causes to the community were found to be major reasons for repeated outbreak of anthrax (Hassan et al., 2015).

The Global Health Security Agenda (GHSA) recommends a multi-sectoral, One Health (OH) approach to be adopted towards strengthening both the global and nation’s capacity to prevent, detect, and respond to human and animal infectious disease threats, occurring naturally, accidentally or intentionally, to contain the spread of a disease of zoonotic importance (WHO,
2016). The approach requires educating the local community on anthrax transmission and prevention, control phases such as real-time surveillance, animal vaccination including mass awareness creation and motivation that will help and thereby facilitate early detection, control, and prevention of anthrax outbreaks (Chakraborty et al., 2012). The issues like improvement of vaccination rate, proper knowledge for early diagnosis of anthrax disease by livestock farmers and optimum awareness level of the community members about anthrax disease are prerequisites to establish an anthrax free area.

**Purpose and Research Objective**

Proper knowledge and optimum awareness level of the community people about anthrax disease are prerequisites to establishing an anthrax-free area. To realize this goal, an Integrated Extension Model (Model) was introduced in the study area to improve the anthrax awareness level. The objective of this study was to assess and evaluate our Model to improve the overall knowledge, attitude, and practice level of the people in concerned area over a sustained period.

**Methods**

**Description of the Integrated Extension Model through the Project**

The Model was designed by the research team for a project titled *An Integrated Approach to Establish an Anthrax-free Model Area in Bangladesh* funded by the Ministry of Education, Government of the People’s Republic of Bangladesh. The Model is based on the recommendation of the Global Health Security Agenda (GHSA). The OH approach, a multi-sectoral involvement approach was used to enhance the key information components of anthrax disease among the community members. In this Model, Bangladesh Agricultural University’s (the Agricultural University in Bangladesh that has many research scholars and working experience on technology extension and research) and the DLS jointly developed tools and materials of anthrax disease control measures conversant with the local context, geographic location, socio-economic status, risk factors, agent, host and environment factors, and their interaction. The vaccination status and community members’ awareness level increased through the integration of all potential sectors changing upon the community as shown in Figure 1.

**How the Model Works**

Firstly, key information and necessary measures pass through the first (outer) circle of different stakeholders like the local governmental health department, law enforcement agencies, livestock office, local administrative government offices (*Upazila Parishad, Union Parishad*), farmers’ club, religious institutions, educational institutions, to sensitize and activate them in their respective fields. Then, these stakeholders take the necessary initiative to influence key persons of the second (inner) circle, like individual households, religious leaders, students, livestock traders, volunteers, meat buyers, and sellers. These key persons have a positive influence on the overall community. The community is our ultimate target for the implementation of overall control strategies. Anthrax control measures in the community appropriately reached would make it possible to build an anthrax-free area, our final goal.

The prime difference of our model from other extension approaches is that with this model we involved all influential groups, and not only the local governmental LDS and/or the Health departments to engage their role at the community level. This method included not only the circulation of information about anthrax but also raising awareness of the role and responsibilities of all groups involved in reaching the targeted goal of development of an
anthrax-free area. Thus the involvement of all the agencies such as local government administration, law enforcement agencies, and mass community awareness is needed.

Figure 1. Integrated extension model. Bangladesh Agricultural University & Livestock Department jointly develops extension tool and materials. Key information passes among agents in the first outer circle, then disseminates to second circle that ultimately impacting upon the community.

Study Area, Design and Populations
The study was conducted in the Kamarkandha Upazila (sub-district) of Sirajganj district, north-western Bangladesh, as shown in Figure 2. The diameter of that area is 4.68 sq. a kilometer, longitude and latitude between 24° 21.933′ to 24° 23.189′ to 24.23.189 and 89° 39.635′ to 89° 38.821′ respectively. Criteria for the area choice were based on the repeated outbreak of anthrax in both animal and human, geographical location, the openness of livestock
department, communication, livestock density and awareness levels among the community members.

Figure 2. Map of Bangladesh indicating anthrax case occurrence, and the location of our integrated extension model implementation areas

A questionnaire was compiled to conduct the survey with a selected cross-section of the target population including livestock farmers, traders before starting the awareness extension program. The questionnaire served to gather baseline data of overall knowledge, attitude, and practice regarding anthrax disease in that community. After that, an awareness program was implemented through the Model for around 2 years. Then, the second survey (mid-term) was conducted using the same questionnaire and the findings were compared with the baseline survey data.

Sample Size Determination and Sampling Procedure
The sample size for the study was determined using a simple random method (Thrusfield, 2009). In mathematical notation: 

\[ n = Z^2 p (1 - p) / d^2 \]

where \( n \) represented the required sample size; \( Z \), the \( Z \)-score at 95% confidence interval or 1.96; \( p \), the expected percentage frequency of likely exposure to anthrax disease through the farmers; and \( d \), the margin of error. From the study area’s estimated population size 4000, a hypothesized expected percentage frequency of 50% was used with 5% desired absolute precision, and a sample size of 351 was obtained. As the desired effect was not more than 1% for cross-sectional study at a single level probability sampling, a contingency of 5% was added to take care of no-response, and the size was adjusted to 372 participants.

Implementation Method of the Awareness Program through the Model
Educational tools were designed and developed by the Department of Agricultural Extension Education of Bangladesh Agricultural University. This model was implemented to reach the entire community. Regular announcements, leaflets, posters and disease brochure
distributions, pictorial billboards, newspaper reports, broadcast of key messages using local cable channels were the informational tools applied to raise awareness about anthrax disease. Community members were categorized into different groups based on their exposure to the disease. Training programs were developed and conducted for schools (primary and high), butchers and farmers. Sensitization workshops and meat market inspections were added to improve knowledge, skill and practice levels. Messages by law enforcement agents, the local Imam (religious leader), and politically influential persons were other strategies used to raise awareness and strengthened the disease control mechanisms.

Data Collection and Management of Statistical Analysis

Two cross-sectional surveys were conducted - one before applying the model (baseline survey) and another after two years of work. A one-stage cluster sampling technique was employed to draw the required sample size of the participants, determined by using online resources like Epi Tools - Sample size calculations (Nielsen, 2012; Sergeant, 2019). The questionnaires for this study was comprised of 3-parts and contained 22 questions, mostly closed-ended, to simplify data processing, minimize variation and improve the precision of response. The 1st part was designed to determine demographic information, the 2nd part, exposure to livestock and the 3rd part, KAP (Knowledge, Attitudes, Practices) of anthrax. Collection, storage, and presentation of data were done by using KoboToolbox (Harvard Humanitarian Initiative) for easy and reliable use in difficult field settings, such as humanitarian emergencies or post-conflict environments. Recorded data of both baseline and evaluation surveys were transferred to excel worksheets format and descriptive statistics were carried out using Microsoft Excel® tools. Descriptive analysis was performed, and results expressed in frequencies and proportions. Categorical response variables were presented as proportions and their associations determined by chi-square tests.

Results

Tools Used for Dissemination of Anthrax Information in the Community

Bangladesh Agricultural University and the Livestock Department jointly developed information tools such as the vaccination card, disease information card, billboard publicity, information leaflet, publicity script for proclamation, training modules, session guide for community yard meeting and resourced-based area mapping. Networks with different stakeholder groups dependent upon the strategy and focus were built to deliver a key message to the community. The evaluation survey engaged respondents with questions regarding how and where they received information on anthrax. The wide variations of answers supported the effectiveness of the Model. All the sources of anthrax message dissemination played a significant role. Among all information disseminators, student disseminators had the largest impact (15%) to deliver the anthrax related key information to the community. Details of the imparting of different sources of message dissemination are provided in Figure 3.
Figure 3. Sources where respondents received their information on anthrax

Demographic and Exposure to Livestock Characteristics of Participants

Of the 372 participants approached for baseline and evaluation surveys, all participated, giving a response rate of 100%. The majority (34.41%) and (38.17%) of them were in the age group 31 and 40 years respectively. The result showed that male and female participation was almost 47.58%. Most respondents had primary or higher level of education and had exposure to livestock. The detailed findings are shown in Table 1.

Table 1.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Baseline</th>
<th></th>
<th>Evaluation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group (Years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11-20</td>
<td>33</td>
<td>8.87</td>
<td>47</td>
<td>12.63</td>
</tr>
<tr>
<td>21-30</td>
<td>54</td>
<td>14.52</td>
<td>68</td>
<td>18.28</td>
</tr>
<tr>
<td>31-40</td>
<td>128</td>
<td>34.41</td>
<td>142</td>
<td>38.17</td>
</tr>
<tr>
<td>41-50</td>
<td>67</td>
<td>18.01</td>
<td>50</td>
<td>13.44</td>
</tr>
<tr>
<td>51 and above</td>
<td>90</td>
<td>24.19</td>
<td>65</td>
<td>17.47</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Male 195 52.42 180 48.39
Female 177 47.58 192 51.61

Education
- Illiterate 45 12.10 30 8.06
- Primary school 77 20.70 101 27.15
- High school 139 37.37 100 26.88
- College or higher 111 29.84 141 37.90

Occupation
- Employed 290 77.96 312 83.87
- Unemployed 82 22.04 60 16.13

Exposure to livestock
- How often contact with livestock:
  - Frequently 234 62.90 197 52.96
  - Sometimes 100 26.88 87 23.39
  - Never 38 10.22 72 19.35
  - Unclear 0 0.00 16 4.30

- Seen any illness signs of livestock:
  - Frequently 48 12.90 54 14.52
  - Sometimes 120 32.26 111 29.84
  - Never 98 26.34 109 29.30
  - Unclear 106 28.49 98 26.34

- Seen any sudden death of livestock:
  - Frequently 14 3.76 19 5.11
  - Sometimes 78 20.97 104 27.96
  - Never 211 56.72 196 52.69
  - Unclear 69 18.55 53 14.25

Change in Knowledge, Attitude and Practice Level of Participants

The comparison of the baseline and the midterm survey results indicates the majority of community members (97.5%) became aware of the nature, occurrence, public health importance, and management of the disease. There was notable change in the knowledge level ($p < 0.05$) after awareness interventions. The misconception of “diseased animal can be slaughtered for meat” decreased from 90% to 60% among members of the target community. Also, the percentage of people who believe anthrax can be prevented and vaccine is effective increased from 10% to 70% and 13% to 77% respectively. But the participation in anthrax control awareness program was not increased like other attitude indicators. Vaccination coverage and primary diagnosis knowledge of anthrax disease among the farmers were increased. The percentage of vaccination coverage was increased from 40% to 85% and the percentage of farmer who can diagnose anthrax has been increased from 30% to 40%. But other practice indicators like proper carcass disposal, the slaughter of sick animals, and compulsory certification were not significantly ($p < 0.05$) improved. The detailed finding from the KAP questionnaire survey of respondents is shown in Table 2.
Table 2
Knowledge, Attitude and Practice Level of Participants in Baseline and Evaluation Survey

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Baseline</th>
<th>Evaluation</th>
<th>Odds ratio (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes %</td>
<td>No %</td>
<td>Yes %</td>
<td>No %</td>
</tr>
<tr>
<td>Knowledge:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heard of Anthrax or Torka</td>
<td>13</td>
<td>87</td>
<td>97.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Learn from awareness program</td>
<td>3</td>
<td>97</td>
<td>67</td>
<td>33</td>
</tr>
<tr>
<td>Vaccine availability in Livestock office</td>
<td>10</td>
<td>90</td>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td>Certification needed for slaughtering</td>
<td>5</td>
<td>95</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Slaughtering diseased animal is illegal</td>
<td>2</td>
<td>98</td>
<td>65</td>
<td>35</td>
</tr>
<tr>
<td>Attitude:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anthrax can be prevented</td>
<td>10</td>
<td>90</td>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td>The vaccine is effective in animal</td>
<td>13</td>
<td>87</td>
<td>77</td>
<td>33</td>
</tr>
<tr>
<td>Diseased animal. can be slaughtered</td>
<td>90</td>
<td>10</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>The awareness program is effective</td>
<td>15</td>
<td>85</td>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td>Willingness to participate in awareness program</td>
<td>5</td>
<td>95</td>
<td>15</td>
<td>85</td>
</tr>
<tr>
<td>Practice:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regularly vaccinate cattle</td>
<td>40</td>
<td>60</td>
<td>85</td>
<td>15</td>
</tr>
<tr>
<td>Carcass disposal procedure followed</td>
<td>2</td>
<td>98</td>
<td>7</td>
<td>93</td>
</tr>
<tr>
<td>Certification before slaughtering</td>
<td>5</td>
<td>95</td>
<td>13</td>
<td>87</td>
</tr>
<tr>
<td>Informing Livestock department about death animal</td>
<td>7</td>
<td>93</td>
<td>30</td>
<td>70</td>
</tr>
<tr>
<td>Slaughtering of sick animals</td>
<td>6</td>
<td>94</td>
<td>8</td>
<td>92</td>
</tr>
<tr>
<td>Never buy meat of infected animals</td>
<td>5</td>
<td>95</td>
<td>37</td>
<td>63</td>
</tr>
</tbody>
</table>

Discussion
The vaccination of healthy animals is a special aspect of the control of anthrax (Ahmed, 2018; Kaufman et al., 1973). They studied the impact of vaccination using the Sterne strain vaccine in controlling the disease. However, a single dose Stern spore vaccine could not be kept with a protective immunity level for a year until the introduction of an additional single dose as a booster (Ndiva et al., 2012; Turnbull et al., 2004; WHO 2008). According to DLS (2018),
The anthrax vaccination rate was not more than 30-40% in the rural area, like our finding in our research area. The success of the establishment of an anthrax free area by mass community awareness extension program depends on the capability to mobilize resources in different sectors, coordination and intersectoral approaches, especially between different stakeholders, including veterinary, health, administration, law enforcement agencies, and public health services. The Model includes all possible stakeholders that can play a role to improve community awareness since each department has their own strategies, responsibilities and service for the well being of the community. Collaboration and constant communication must improve knowledge, attitudes and practice level of the mass of people in the community.

A study in Wisconsin by Grant and Olsen (1999), indicated that not only did physicians and veterinarians hold very different views about the disease risks from certain animals and infectious agents, but that they also communicated very little with each other about zoonotic diseases and their prevention. Many researchers (Hairi et al., 2003; Itrat et al., 2008; Nalongsack et al., 2009), recommended the development of educational strategies designed to improve behavior and practice of effective disease control measures.

Regarding the origins of outbreaks of anthrax, guidelines for the surveillance and control of anthrax in humans and animals compiled by the Veterinary Public Health Anthrax Group of the World Health Organization in 1993 highlighted the need for comprehensive preparedness and response guidelines (Anonymous, 1993). Shanko et al. (2015) also recommended a model for success in the prevention and control of major zoonoses. They suggested that the model depends on the capability to mobilize resources in different sectors and on coordination and intersectoral approaches, especially, between national (or international) veterinary and public health services. Our Model in the research area follows and is supported by this recommendation.

The demographic data of our survey resembles the national agriculture and rural statistics (BBS, 2018). National agricultural and rural statistics about literacy rate, man-women proportion and involvement with livestock are similar to those of our survey findings. Knowledge, attitude and practice level at the baseline of this study are comparable with the findings of other researchers in Bangladesh (Hasan et al., 2015; Islam et al., 2018). However, the respondents’ practice improvements over the course of the extension program were much lower than their knowledge and attitude improvements. The attention of local administration and law enforcing agency should be focused on that issue. On the other hand, the poor economic background together with the dispersed settlement nature of the farmers were the main possible reasons that have continued to force them to slaughter infected animals, sell their products and conceal that information from any potential notice. But it can be said that the knowledge, attitude and practice level were significantly improved in the Model area due to the awareness-raising interventions.

Conclusions and Recommendations

Through the application of the Integration Extension Model over two years, most of the community members (97.5%) became aware of the nature, occurrence, public health importance and the management of the disease. The negative impact due to the attitude toward the slaughtering of sick animals was reduced (<30%). The attention of local administration and law enforcement agencies markedly focused on that issue. On the other hand, the percentage of vaccination coverage was increased from 40% to 85% and the percentage of farmers who can diagnose anthrax has been increased from 30% to 40%. It would not be possible for only the local governmental LDS and/or Health department of the local area to control any zoonotic disease by a time-bound program.
Based on these findings, it can be concluded that this model is efficient, effective, and suitable to increase the awareness level of the people toward the control of any zoonotic disease like anthrax. However, the program did not show promising results over the behavior improvements of the target community. The change of behavior/practice is the most important thing for controlling the disease. Further research should be focused on exploring this aspect of integrated extension programming.

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Impact of Agricultural Communication Interventions on Improving Agricultural Productivity in Malawi

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Abstract
Agricultural communication (AGCOM) has been known to aid in disseminating research-based agricultural information among Malawian farmers. In 1958 the Malawi Government, via the Ministry of Agriculture, established the Agricultural Communications Branch (ACB) in an attempt to increase access to and adoption of scientifically-proven technologies among farmers. Moreover, in 2000 the Malawi Government started implementing an agricultural extension policy that promoted pluralistic demand-driven extension, which led to the increased availability of non-governmental organizations providing AGCOM services to farmers. However, after several decades of using different communication tools to promote new technologies, low productivity in most small holder farms remains a challenge, with limited adoption of improved technology as one of the contributing factors. In this exploratory, convergent, mixed methods study, 30 Malawian farmers and six AGCOM officers who were selected using convenient and snow ball sampling respectively participated in key informant interviews. In addition, 64 AGCOM officers who were selected using simple random sampling were involved in a survey. The findings of the study revealed that information delivered to farmers does not address farmer needs in most cases. Specifically, existing policies, source and availability of funding, and the agricultural calendar influenced choice of information that was disseminated. For example, the existing policy does not allow AGCOM officers to disseminate local and innovative farmer practices unless they are tested and approved by scientists. Such policies, perpetuates a mindset among farmers that innovations originate from outside their communities, thereby making it hard for them to share their local, indigenous ideas with their colleagues. Moreover, it has contributed to the inability of AGCOM to be used as an innovation creation tool, hence AGCOMs’ limited impact.

Keywords: adoption, improved technologies, agricultural communication, increased productivity, information dissemination
Introduction

Since its inception, agricultural communication (AGCOM) has been known to aid in disseminating research-based agricultural information to farmers (Cash, 2001). This led to the use of AGCOM as a tool rather than as a science for understanding behavior (Tucker, 1996). However, for developed countries like the U.S., there have been changes in AGCOM focus, one of which include the inclusion of the general public and not only farmers as the audience for AGCOM (Tucker, Whaley, & Cano, 2003). While for most developing countries like Malawi, AGCOM is still used as a promotional and awareness creation tool among rural farmers to facilitate adoption of improved technologies for increased productivity in small farms (Masambuka-Kanchewa, 2013; Masangano, Kambewa, Bosscher, & Fatch, 2017; Ragasa, Aberman, & Mingote, 2017).

In Malawi, agricultural communication interventions dates back to 1958, when the Malawi Government, via the Ministry of Agriculture, established the Agricultural Communications Branch (ACB) in an attempt to increase access to and adoption of scientifically-tested and proven technologies among farmers (Manda & Chapota, 2015). Moreover, implementation of a pluralistic, demand-driven extension service in 2000 led to an increased availability of non-governmental organizations providing agricultural extension services to farmers (Masangano et al., 2017). Inorder to improve efficiency and increase extension coverage, most of these organizations adopted the use of Information Communication Technologies (ICTs) as a tool for delivering information on improved technologies to farmers (Steinfield, Wyche, Cai, & Chiwasa, 2015). After several decades of using different communication tools to promote emerging technologies, low productivity among most small holder farms remains a challenge (Lunduka, Fisher, & Snapp, 2012; Ragasa et al., 2017). Furthermore, access to information to guide farmers production practices is still highlighted as a major constraint (GoM, 2016, p4). Despite, increased focus on the use of AGCOM as an improved technology dissemination tool, little is known regarding its impact on addressing farmers’ needs as well as capturing farmers’ voices (Masambuka-Kanchewa, 2013; Ragasa et al., 2017; Masangano et al., 2017). Effectiveness of AGCOM interventions can only be achieved if these tools are used to address different challenges faced by farmers at various stages of their production and decision making processes (Masangano et al., 2017). Therefore, the limited impact of AGCOM on the adoption of improved technologies among small holder farmers raises a question as to whether using AGCOM as an awareness or technology promotion tool in Malawi is effective.

Theoretical Framework

Framing Theory (Scheufele, 2000) and the Theory of Diffusion of Innovations (Rogers, 2003) were used to guide the study. Framing “refers to the process by which people develop a particular conceptualization of an issue or reorient their thinking about an issue” (Chong & Druckman, 2007, p.104). Framing is important for presenting complex ideas as it is known to be useful in improving comprehension of ideas and concepts (Scheufele & Tewksbury, 2006). Framing is achieved through selection, placement, and presentation of specific topics or issues in a way that allows the audience to focus on specific elements while making salient selected components (Matthes, 2009). Frames are categorized as either individual or media frames (Scheufele, 1999). Individual frames are described as “internal structures of the mind ( Kinder & Sanders, 1990, p. 74). These frames are “mentally stored clusters of ideas that guide individuals’ processing of information” (Entman, 1993, p. 53). On the other hand media frames are “a central organizing idea or story line that provides meaning to an unfolding strip of events . . . The frame
suggests what the controversy is about, the essence of the issue” (Gamson & Modigliani, 1987 p. 143). Media frames assist journalists package information in a way that is easily understood and apprehended by the audience (Gitlin, 1980). Intellectuals, political leaders, or other people with power and vested interests are responsible for building frames, while the media is responsible for setting the frames (Scheufele, 2000). Frame building involves formation of ideas or narratives that feed into news stories or narratives that are transmitted by the media (Scheufele, 1999) while frame setting “is concerned with the salience of issue attributes (Scheufele, 1999 p.166).

In most developing countries, AGCOM has been framed by the policy makers, scientists and other players as an awareness creation and improved technology promotion tool (Briggs & Moyo, 2012; Dhaka & Chayal, 2016; Šūmane et al., 2018). As such different mass media channels, such as radio and newspapers, have been useful and influential in reaching out to more people as they are believed to contribute towards the adoption of improved technologies (Doerfert, & Irlbeck, 2011; Graybill-Leonard, Meyers, Mcquail & Windahl, 1995; Tucker, et al., 2003). However, effective communication entails provision of opportunities for dialogue between and among farmers and other players so they are able to express their concerns and needs as well as incite a response from relevant stakeholders (Rodriguez-Colombia, 2015). Moreover, a lot of research in AGCOM frames has been conducted in U.S.A and has focused on the impact of mass media framing of agricultural information and its impact on public perceptions about agriculture (Charanza & Naile, 2012; Sellnow & Sellnow, 2014; Specht & Beam, 2015).

The importance of communication channels in disseminating agricultural information cannot be over emphasized as indicated by the Diffusion of Innovations Theory (Dol) (Rogers, 1976). Dol theory looks at how a new idea or innovation spreads or is accepted by people in a social system and people’s decision-making process (Rogers, 1976). Diffusion is defined as “the process by which an innovation, perceived as a new idea, spreads via certain communication channels over time among the members of a social system” (Rogers, 2003, p.13). Innovations have been perceived as originating from outside the social system (Dagron, 2009), hence the need for communication channels to diffuse them into the social system.

Individuals go through different stages as they decide to adopt or reject a technology or an innovation. Rogers (2003) identified these stages as: “knowledge, persuasion, decision, implementation, and confirmation” (p. 20). Therefore, the effectiveness of communication channels in diffusing innovations depends on which stage a person is in during the decision-making process. However, for AGCOM, the focus has been mainly on mass media including ICTs and their role in improving farmers’ access to information on improved technologies (Rogers, Shinghal, & Quinlan, 2009) while ignoring the differences that exist in farmers’ decision making stages. Interpersonal communication channels, as opposed to mass media communication channels, have been known to be effective during the persuasion stage while mass media channels are said to be effective during the knowledge phase (Rogers, Shinghal, & Quinlan, 2009). Therefore, knowledge of an individual’s stage in the decision making process is crucial in ensuring that relevant communication channels are selected and used. Moreover, framing of AGCOM as a tool for disseminating information on improved technologies to farmers affects the use of communication channels and how information is disseminated within a social system (Rogers, 2003).

**Purpose and Research Questions**

The purpose of this study was to explore the effectiveness of AGCOM interventions towards improving agricultural productivity in Malawi. The following research questions were...
used to guide the study: 1) What factors influenced choice of content and communication channels? 2) How did farmers perceive AGCOM and its role on improving agricultural productivity? and 3) What perceptions did AGCOM officers have regarding the role of AGCOM?

Methods

Using a pragmatic paradigm lens (Badley, 2003; Jacobson, 1993), the researcher sought to understand how AGCOM activities were implemented in Malawi including the involvement of farmers’ and AGCOM officers. The pragmatic paradigm was used to guide the researcher in understanding the underlying factors for the use of agricultural communication and their practical and empirical implication on agricultural development (Badley, 2003; Johnson & Onwuegbuzie, 2004; Yvonne Feilzer, 2010). Therefore, the results of this study were not only expected to be statistically significant but socially significant as well. An exploratory, convergent, mixed-method research design was employed to capture both farmers’ and AGCOM officers’ perspectives (Creswell & Creswell, 2017). Therefore, both theoretical and methodical triangulation were employed (Denzin, 1970). Theoretical triangulation involves the use of more than one theory to study a given construct (Denzin, 1970). Therefore, theoretical triangulation was applied in this study and involved the use of two theories: diffusion of innovation, and framing theories. The methodological triangulation involved both “in method and between method triangulation” (Denzin, 1970, p. 298).

In method and between method triangulation was used in this study through collection of data in multiple ways such as: content analysis of communication artifacts and other documents, interviews with farmers and communication officers and surveys with communication officers. The qualitative data from the communication officers were collected before conducting the interviews with the farmers as such farmer interviews were used for triangulation. Triangulation was useful in this case because it assisted in understanding the drivers of AGCOM from both farmers’ and AGCOM officers’ points of view (Greene, Caracelli, & Graham, 1989; Kwok, 2012). Surveys were used to collect quantitative data and key informant interviews were used to collect qualitative data in order to have an in-depth understanding of the issues under study.

AGCOM Officer Survey

Population and Sampling.

The population of interest for this part of the study were AGCOM officers working in Malawi for both the public and private organizations. A sampling frame was created from the Department of Agricultural Extension’s communication officers’ database of AGCOM organizations in Malawi. Using simple random sampling, 64 AGCOM officers were recruited from a population of 100 to participate to ensure the sample was representative of all AGCOM officers in Malawi (Creswell, 2011). AGCOM officers recruited were from 34 AGCOM organizations throughout the country which included: public organizations, both local and international non-governmental organizations, private, and farmers’ organizations.

Instrumentation, Data Collection and Analysis

The AGCOM officer questionnaire contained both closed-ended, Likert scale-type questions which were developed based on the results of a content analysis of the communication artifacts developed by various AGCOM organization in Malawi between 2010 and 2016 (Masambuka, Rodriguez & Buck, 2018). In addition, closed-ended and Likert scale-type questions were modified from existing scales to capture the officers’ perceptions of AGCOM (Ajzen, 2006; Jirojwong, Johnson, & Welch, 2014). Two constructs were created based on the responses: Role of AGCOM in agriculture and Importance of AGCOM. The Likert scale items
ranged from 1 – *Strongly disagree* to 5 – *Strongly agree*. The closed-ended items included 10 dichotomous items which assessed factors influencing choice of messages to deliver. These were created from a list of items that identified reasons why officers developed messages based on the results of the content analysis. In addition 10 items that assessed choice of channels used were also included based on the results of the content analysis.

A panel of experts that included a statistician, two U.S.A based AGCOM professors, a research design expert and two AGCOM practitioners was used to ensure face, content and construct validity. A pilot test was run with 30 respondents from five countries in Sub-Saharan Africa namely; Malawi, Zambia, Kenya, Tanzania and Namibia. Internal reliability for all each scale was calculated *ex post facto* with a Cronbach’s alpha coefficient of .84 for Role of AGCOM in agriculture and .85 for Importance of AGCOM and uses of AGCOM. Moreover, the upper and lower bound correlation coefficient for the dichotomous variables (Sun et al., 2007) was calculated *ex post facto* with a cronbach’s alpha coefficient of .82 for choice of channels and .80 for choice of messages.

Two trained enumerators and the primary researcher distributed the survey to the respondents at their various offices. The research team left their contact details with the respondents, and the respondents communicated with them through WhatsApp whenever they had completed the survey. In addition, the enumerators collected contact information from the respondents and followed up with them up to three times for a period of three weeks before considering the respondent as non-responsive. Data collected from the surveys were analyzed using Statistical Package for Social Scientists (SPSS) version 25. Descriptive statistics including frequencies and cross tabulations were used to analyze the data.

**Farmer and AGCOM Officer Interviews**

**Population and Sampling.**

A total of 30 (both crop and livestock) farmers, 15 men and 15 women, were recruited using convenience sampling to participate in the key informant interviews. The use of convenience sampling ensured that only those participants who were available and willing to take part in the study were recruited (Dörnyei, 2007). Participants were drawn from three villages representing the three regions of the country so differences in production and cultural systems as well ecological patterns, which may have an impact on farmers’ experiences and knowledge, were incorporated. Moreover, an equal number of men and women were recruited from each village to take part in the interviews to accommodate differences that may exist among farmers due to gender differences (Ary, Jacobs, Sorensen, & Razavieh, 2010; Flyvbjerg, 2006).

In addition, six AGCOM officers were recruited using snowball sampling (Goodman, 1961). Snowball sampling was used to ensure only participants that were knowledgeable about the subject matter were recruited so relevant and accurate information was captured (Ghosh et al., 2013). Of the six AGCOM officers, five worked with the ACB, a part of the public extension provider within the Ministry of Agriculture. One AGCOM officer was from a private extension provider known as Farm Radio Trust (FRT). Deliberate measures were put in place to ensure that only officers who had served for at least up to five years were included in the interviews to ensure that only experienced officers were involved. As such there were more participants from the Ministry of Agriculture because most of the organizations did not have officers who had served for that period of time.
**Instrumentation and Data Collection.**

Two semi-structured interview guides were used – one for farmers and the other for AGCOM officers. To ensure the semi-structured interview guides contained relevant and objective questions, a content analysis was conducted on communication artifacts, such as video and radio programs, as well as print materials developed and disseminated to farmers between 2010 and 2016 (Holsti, 1969; Masambuka et al., 2018). The farmers’ interview guide was pilot tested with 20 farmers from Columbus, Ohio while the AGCOM officers’ interview guide was pilot tested with five AGCOM officers from Malawi who did not take part in the full study.

Two trained enumerators and the principal investigator conducted the interviews. All the farmer interviews were conducted at a central location chosen by the community members. Extension workers for each community recommended mobilizing the farmers to meet at a central location. The extension workers communicated with the community members a day before each meeting so the farmers could come to a specific meeting place which ranged from churches, schools, to community grounds. To ensure every participant was able to express their views without being interrogated (Morgan, 1996), arrangements were made so the one-on one interview were conducted privately. All the farmer interviews were conducted in Chichewa, as the vernacular language for Malawi, and lasted for a maximum of one hour. While the AGCOM officer interviews were held in the officers’ offices in English. Each AGCOM officer interview lasted approximately 30 minutes. All the interviews were recorded using audio recorders.

**Reflexivity Statement.**

The researcher acknowledges that her experience and knowledge about the AGCOM programs in Malawi may have influenced her interpretation and analysis of the data. The researcher was a doctoral student at the time of the interviews but had previously held a role as an AGCOM officer for the Ministry. Moreover, before starting her doctoral program, the researcher was responsible for coordinating all AGCOM in Malawi and had previously interacted with some of the interview participants.

**Data Analysis.**

Both inductive and deductive data analysis approaches were used (Thomas, 2006) during and after the data collection process. Field notes were taken after each interview and analyzed to identify emerging themes which were then followed up in subsequent interviews. All interviews were transcribed and translated prior to data analysis. Pseudonyms were used to cover the identity of the participants where one initial such as J was used for female respondents and two initials such as PE were used for male respondents. NVivo Pro was used to analyze the data from the key informant interviews with emergent themes and subthemes generated. The themes were reported based on the number of times statements corresponding to a given theme emerged. For example, if a statement was mentioned by four or more AGCOM officers, the word “majority or most” was used and for those themes that had two corresponding statements, the word “few” was used (Harding, 2013). The same approach was used for the farmer interviews. In this case, if there were more than 20 corresponding statements, the word “majority” was used and if there were more than 15 corresponding statements, the word “some” was used. If there were less than fifteen statements, the word “few” was used.

**Data Integration.**

Data from the key informant interviews and the surveys were analyzed independently and then integrated to interpret the meaning of the results (Bazeley, 2012, Creswell & Creswell, 2017; Sandelowski, 2000). The quantitative results were explored and reported in line with the qualitative results (Eisner, 1991; Fetters, Curry, & Creswell, 2013). Specifically, quotes from the
interviews were used to substantiate the findings of the quantitative research (Bazeley, 2012). The quotes were chosen regardless of the content as long as they addressed the questions that appeared to be significant in the quantitative results. Therefore, quotes were selected regardless of the existing discrepancies with the quantitative results.

Results

Demographics of Survey Respondents
A total of 64 AGCOM officers, comprised of 27 women (42%) and 37 men (58%) working for 30 different organizations in Malawi were surveyed. Respondents ranged from 24 to 69 years of age ($M = 35.00; SD = 8.14$). The majority of the respondents ($n = 29$) worked for the ACB as it is the major public AGCOM organization in the country followed by respondents who were working for international non-profit organizations ($n = 15$). Only 35% had a college degree in journalism. While less than 10 percent ($n=6$) had associate degrees in others fields which included agribusiness management, sociology, website management, and administration.

Demographics of Key Informant Interviews Participants
The six AGCOM interview participants included two women and four men. Their years of service ranged from nine to 21 years. Almost all of the participants indicated serving in one position except for one officer who reported they had switched organizations. A total of 30 farmers participated in the key informant interviews including 15 men and 15 women from three districts. The farmers’ years of farming ranged from six years to 50 years with the majority having farmed for 20 years. Maize was indicated as one of the crops grown by the farmers in all the communities. However, there were variations in other types of crops grown and livestock raised from district to district.

Factors Influencing Choice of Content and Communication Channels Used

Factors Influencing Choice of Content.
AGCOM officers were asked to indicate factors that influenced their choice of content. Importance of the message in addressing farmers’ needs was reported as the major influencing factor ($n = 63; 98 \%$) followed by organizations’ requirements ($n = 58; 90 \%$). Availability of farmers to share negative experiences was the least influential factor ($n=32; 90 \%$). However, during the interviews, the agricultural calendar, availability and source of funding, and the existing policies emerged as influencing choice of content from the interview data.

Agricultural calendar.
The majority of the officers reported the agricultural calendar was used as a guide when deciding the type of content and message to disseminate. For example, PE stated,

We are able to identify the message needs by identifying gaps where we feel that farmers are supposed to get information depending on the agriculture calendar which we have, so using the calendar we are able to decide as to what messages we are supposed to produce each month.

The agricultural calendar is a handbook that provided instructions on different agricultural activities that are supposed to be implemented based on the ecological zones. However, the last time the calendar was updated was in 2000.

Availability and source of funding.
The availability of funding and the source of funds were reported by the majority of the officers as influencing choice of content to develop and disseminate. For example, it was reported that in most cases, choice of content to disseminate was influenced by the objectives of
different projects. MN stated, “Some projects they pay… the project comes with their own objectives for example, some projects promote only maize others promote rice production.” Moreover, the source of funding not only influence the type of message to disseminate but also the locations that are visited for the collection of content. J summarized this well when he stated, …We cannot cover some places where that project is not working so we go where that project is working but the message goes to the whole country...But for content collection it's that area where the project is working but for the message it goes nationwide.

Existing policies.
The majority of the participants indicated they were not supposed to disseminate any technologies that have not been scientifically proven, even in cases where farmers have innovations that seem to be working as summarized in the following response from PE:

We cannot disseminate messages on our own without waiting for the researchers telling us to disseminate the information. For example, this year most we had an army worm outbreak and one farmer in Zomba had a concoction that he was using and managed to eliminate the problem in his field. We went and talked with him during a field day, but we could not promote what he was using because the researchers have not tested and approved it.

Factors Influencing Choice of Communication Channels Used.
Table 1 shows the respondents’ results when they were asked to list the factors influencing their choice of communication channels. The results indicated the type of message being delivered (n = 62) and number of people reached by the media (n = 60) were the top factors influencing choice of a communication channel. Respondents’ competency in using the media channel was indicated as one of the least influencing factors (n = 46), followed by requirements from funding organization (n = 44).

Table 1. Factors influencing AGCOM officers' choice of communication channels

<table>
<thead>
<tr>
<th>Influencing Factor</th>
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<th>%</th>
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<tbody>
<tr>
<td>Type of message</td>
<td>62</td>
<td>95</td>
</tr>
<tr>
<td>Number of people reached</td>
<td>60</td>
<td>92</td>
</tr>
<tr>
<td>Availability of resources</td>
<td>59</td>
<td>91</td>
</tr>
<tr>
<td>Farmers’ media accessibility</td>
<td>57</td>
<td>88</td>
</tr>
<tr>
<td>Farmers’ ability to use media</td>
<td>56</td>
<td>86</td>
</tr>
<tr>
<td>Time required to send the message</td>
<td>58</td>
<td>89</td>
</tr>
<tr>
<td>Organization requirement</td>
<td>50</td>
<td>77</td>
</tr>
<tr>
<td>Officer’s media accessibility</td>
<td>47</td>
<td>72</td>
</tr>
<tr>
<td>Officer’s competency using the media</td>
<td>46</td>
<td>71</td>
</tr>
<tr>
<td>Funding organization requirement</td>
<td>44</td>
<td>66</td>
</tr>
</tbody>
</table>

*Note: n= 64. The officers were asked to respond to each question.

In terms of media channels used when delivering agricultural information, the majority of the respondents (86%) reported using print media, followed by radio (83%). Television and mobile phones were reported as the least used media channels (65% and 63% respectively).

Availability of funding emerged as one of the themes that influenced the type of channels used during the interviews. Specifically, the participants indicated availability of funding influenced the times at which various radio programs were aired, quantity of print publications
produced and disseminated, as well as the frequency at which radio programs were aired. Moreover, the officers reported airing programs during times when they were aware that farmers would not be able to access the messages. PE summarized this well stating,

Many people were saying that we would be able to listen to the program soon after six o’clock because that’s when we are at home…So, what we decided to do was to look at the monetary issue. After six o’clock was very expensive.

The impact of funding was also reported as affecting continuation of various radio or television programs even in cases where farmers still demanded the programs as summarized in the following response from PN:

Farmers were asking why we are not watching these programs so it’s difficult to explain the truth to farmers that we are failing to this because of the issue of political issues we can’t say the government do not have monies.

Funding availability was also observed as contributing to limited production of print materials. K stated, “We produce less copies for the farmers because of financial problems so many farmers do not have uhm, what can I say I can say do not have access to the publication that we do produce here.”

Farmers’ Perceptions of AGCOM and its Impact on Implementation of AGCOM Interventions

In order to explore farmers’ perceptions about AGCOM, participants were asked to describe what they perceived as the purpose of the information they received as well as their involvement in the content and channel selection. All the interviews revealed the farmers perceived AGCOM as being used to improve technology dissemination and as an instruction delivery tool. Moreover, the farmers also indicated they are not involved in channel and content selection.

**AGCOM as an Improved Technology Dissemination Tool.**

The majority of the participants indicated that most of the information they had access to was aimed at disseminating new and improved technologies as summarized in the following response from E: “We hear more about improved farming practices such as conservation agriculture which is being promoted nowadays.”

In addition, it was observed the farmers believed only successful farmers who had adopted improved technologies were featured in the radio programs. As such they were willing to share their success stories about adopting improved technologies. For example, FS stated,

Am comfortable to share my input because I have benefitted from the advice that I have been getting from the radio unlike how I used to benefit in the past, so I feel I am supposed to be providing input.

**AGCOM as an Instructional Tool for Dissemination of Proper Farming Practices.**

The majority of the participants indicated they viewed AGCOM as being aimed at teaching them about different farming practices as such viewed themselves as just passive learners as summarized in the following responses from M: “They teach us how to make manure, proper farming practice” which was echoed by PK: “They tell us to start preparing our land, making manure, making and buying fertilizer.”

**Relevance of the Messages in Addressing Farmers Needs.**

When the participants were asked about their opinions regarding the relevance of disseminating information on improved technologies, the majority indicated they found the information useful. CC stated, “When we have access to agricultural information you are able to
learn and apply so that one is able to differentiate modern agricultural practices with traditional ones.” However, despite their acknowledgement of the information being relevant and useful, some expressed the information does not address their needs. K stated, “In this area farmers are receiving information on crops that farmers in this area do not grow…. sometimes they are provided with information on rice production and yet people in this area farmers do not grow rice.”

Timing for the delivery of the messages was also indicated as affecting farmers’ ability to perceive the information as being relevant. CC stated, “The information comes at the wrong time because of that you end up failing to get the message because you have not been able to access the message.” This was echoed by KK: “They said we should be making manure that is last year sure, but the message came in late after the rains had already started so we failed to make manure.”

The participants also expressed concerns regarding the information on improved technologies. They felt it was not location specific which makes it hard for them to benefit fully from such messages. WB stated, “When providing advice please advise farmers to plant seeds that are indeed beneficial based on their geographical locations because the areas are different. Because in some cases, they send seeds to areas where they cannot do well…”

Additionally, the majority of the participants indicated they do not find the information disseminated through various channels as being trustworthy based on their experiences. E stated, “We know that the information that is provided to us is not accurate. So, like I have said that we just listen from the radio and when we get the information from the radio we do not to take the information as gospel truth and wholly as such we try to pick or choose what to take seriously or not…”

This sentiment was echoed by M when he stated,

We just decided to follow the traditional methods because we saw that they were useful in areas where the improved methods were failing. So, we still use a portion of land and practice our traditional methods while another piece we practice the improved ones, but we have seen that our traditional methods still work.

To respond to the challenges associated with the information, the majority of the participants indicated they conducted their own evaluation before implementing what they had been told. TJ summarized this well when he stated,

We take the advice with caution, for example there was the extension advice on increasing fertilizers we picked it up but not fully, so we start by practicing a little bit by coming up with portions where we implement that and for the rest, we follow our own practices. So we say on this piece of land let me host a demonstration and for this field let me apply this new fertilizers and the other piece the old fertilizer so that I can compare if the demonstration plot works then I am good to go otherwise I do not just go ahead and implement without trying and knowing the answer but you just have to know what will be the outcome so divide the piece of land.”

Moreover, TJ and some of the farmers also expressed concern over their lack of involvement in the selection of content and channels used for disseminating agricultural information and indicated that some of messages that they receive are not useful. TJ stated, “…these people just send the messages because they just follow the agricultural calendar since all they know is that during this season these are the activities that farmers are involved in, but they have not seen that we are really doing.”
Additionally, the majority of the participants indicated the language used in these programs poses a challenge to farmers to access the information. P shared, “The information that is delivered in English when farmers in this area do not understand English.” This was echoed by KK, stating “…The problem is understanding because the language that they use on the radio and our language here may be different.”

Some of the farmers also indicated the information provided through the radio lacked some details. KK stated,

Uf on the radio, I have never heard them describe differences in the topography of the land, but I heard that we should grow vetiver grass in all the land where there is a water way that's all. They don't talk about the differences in the land topography while the extension worker tells you.

Lack of consistency in providing the messages was also indicated as one of the factors that makes it hard for farmers to fully benefit from the messages. TT shared,

It happens that at first, we are able to get the information and then after a while we end up not having access to the information anymore even before we got a chance to get all the information that we needed as such we end up being stuck not knowing what to do.

AGCOM Officers’ Perceptions of AGCOM

In the survey, respondents were asked to indicate their opinions regarding the purpose of AGCOM by responding to true or false items. The majority of the respondents (n = 63; 97%) had the view that AGCOM was used to inform farmers about improved technologies. This was followed by the opinion that AGCOM was used for communicating farmers’ needs to policy makers and scientists (n = 58; 89%). Sharing farmer success stories with funding organizations was indicated by fewer officers (n = 47; 72%) while the opinion that AGCOM was about informing people with little agricultural knowledge about agriculture was indicated by the least number of respondents (n = 44; 68%).

However, when AGCOM officers were asked their opinions on the purpose of AGCOM during the interviews, the participants indicated the purpose of AGCOM was to disseminate information to the farmers. This was emphasize by KE when he stated,

The main reason is to make sure that our farmers are always having updated information so that they are able to produce more not like how they used to farm in the past when they used their local and indigenous knowledge.

Conclusion, Recommendations and Implications

The results indicated AGCOM’s potential contribution toward improving agricultural productivity not fully explored in Malawi. Limited involvement of farmers in the communication process and increased focus on the use of AGCOM for communicating new ideas and not the adaptation of existing ideas contributes to AGCOM’s ineffectiveness (Leeuwis & Aarts, 2011). This is the case despite availability of studies dating back several decades (Higgins, 1991) which emphasized the importance of promoting two-way communication between farmers and policy makers, as well as researchers. Currently, AGCOM has been framed as a tool for disseminating information on improved technologies to farmers (Aker, 2011; Manda & Chapota, 2015; Matthes, 2009; Ragasa et al., 2017). Moreover, there is increased focus on using AGCOM as an instructional tool or for creating awareness which limits farmers’ ability to demand services (Masangano et al., 2017; Ragasa & Chiyu, 2017). Use of AGCOM as an instructional tool or as an awareness creation tool has contributed to a failure by farmers to value local and indigenous knowledge. Hence, leading to the promotion of a mindset among farmers that only outsiders
have and can provide answers to their problems. As such, it denies farmers the opportunity to address their own problems using local resources and knowledge.

Furthermore, the existence of policies that deny the dissemination of farmers’ innovations through established communication channels perpetuates the perception that AGCOM should be used for communicating to farmers and not with and among farmers. There is a need to revisit policies on technology dissemination so farmers are provided with opportunities to use established and efficient communication channels to share their ideas and innovations. Moreover, there is a need to take advantage of the strong social networks that exist in rural areas to promote information and innovation sharing among farmers with support from extension agents (Briggs & Moyo, 2012; Šūmane et al., 2018).

Increased focus on using AGCOM as an awareness creation tool ignores the importance of communication in other stages of the DoI process (Rogers, 2003). As a result, it has contributed to the increased use of mass media channels with the expectation that increasing awareness of a given technology will contribute to the adoption of the technology. However, such an approach ignores the role of other channels, including interpersonal communication, when persuading farmers to adopt or reject a technology explaining part of the reason for low adoption rates related to emerging technologies despite increased efforts to disseminate the technologies to farmers using different mass media channels.

Most of the mass media channels used in agriculture do not provide opportunities to include farmers’ innovations, voices, and demands; thus, limiting farmers’ ability to demand services or share their views (Masangano et al., 2017; Ragasa et al., 2017). For AGCOM to have a positive impact on sustainable agricultural development, there is a need to a shift the focus from using AGCOM as an improved technology transfer or awareness creation tool to one that communicates farmer’s needs, experiences and perceptions about different technologies, enhancing and promoting dialogue among farmers, policy makers and researchers.

The existence of various ICTs, such as mobile phones, presents an opportunity to capture real time farmer needs with messages that are location specific. However, in order to explore the effectiveness of various communication channels in enhancing the adoption of scientific innovations, there is need for more research on the role of AGCOM in the other stages of the DoI. Specifically, more research is needed that explores the use of ICTs as a way of increasing extension coverage taking into consideration both scope and size.

Despite only using descriptive statistics, the differences in the responses from the surveys and key informant interviews calls for the need for further research utilizing mixed method designs coupled with inferential statistics to examine factors that influence the development and dissemination of agricultural information. The results of this study revealed AGCOM programs and activities are not driven by farmers’ information needs but rather by requirements from funding organizations. Considering AGCOM activities in most developing countries is dependent upon project funding, there is need for more research to be conducted to assess the impact of project fund dependency on AGCOM activities. Furthermore, the interviews with the AGCOM officers indicated they do not contribute to the selection of communication channels but rather are dictated by the organizations for which they work. Therefore, there is need for more research aimed at assessing perceptions of the role of AGCOM officers in various AGCOM organizations. Finally, there is also need for more research to examine AGCOM programs course offerings, especially in developing countries. Such research will be important in identifying the skills and knowledge AGCOM student’s acquire while obtaining their degrees,
and its importance in enabling AGCOM officers to serve as dialogue promoters as opposed to information disseminators.

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Awakening Transformative Learning: A Comparison of the Dissonance Experienced by Agriculture Majors During Study Abroad Courses to Costa Rica and Thailand

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Abstract
Students who have participated in study abroad courses exhibit an improved capacity for citizenship, emotional growth, and global competence. However, achieving such requires that study abroad courses be designed to allow students to question their underlying beliefs and values—a concept called dissonance. When individuals reflect on dissonance, it has been reported to spur a process in which their previously held perspectives are transformed. As such, this investigation sought to compare the dissonance experienced by agriculture majors (N = 21) at Louisiana State University during study abroad courses to Costa Rica and Thailand. We bounded cases by academic college, degree level, and year. However, they were distinct regarding context and duration. As a result, two forms of dissonance were consistent across cases: intellectual and moral. However, within cases, we also distilled context-specific dissonance that students grappled with that helped them reconsider their previously held worldviews. Our findings demonstrated that when students processed dissonance productively, their global knowledge and perspectives were transformed. We also concluded that although shared forms of dissonance existed, it is imperative for faculty to design students’ experiences abroad purposefully to nurture students’ perspective changes in transformative ways.

Keywords: Costa Rica; dissonance; study abroad; Thailand; university agriculture students
Introduction and Literature Review

Over the past few decades, globalization has affected nearly every aspect of society (Longo & Saltmarsh, 2011). For U.S. higher education institutions, the cultural, economic, political, and social interconnectedness of the world, as well as improved opportunities for collaboration and the sharing of knowledge, have illuminated the need to emphasize global perspectives in the undergraduate curriculum (Blake-Campbell, 2014; Hartman & Kiely, 2014; McCabe, 2001; Ogden, 2007). However, Bok (2006) argued, “it is a safe bet that a majority of undergraduate students complete their four years with very little preparation either as citizens or as professionals for the international challenges that are likely to confront them” (p. 233).

Previous evidence has demonstrated that graduates who have been exposed to global perspectives in their undergraduate experience were better prepared to solve cross-cultural issues and problems (Myers, 2010). One approach that U.S. higher education institutions have used to achieve such outcomes is through international education experiences, such as study abroad courses (Boli & Petrova, 2008; McCabe, 2001; Ogden, 2007; Reilly & Senders, 2009).

Study abroad courses are structured academic excursions in which students: (a) participate in well-planned curricular activities, (b) partake in cross-cultural exchanges through direct interaction with others, and (c) engage in a critical reflection on their experiences to obtain a better understanding of global connections and an appreciation for the customs and traditions of their host country (Longo & Saltmarsh, 2011). Over time, study abroad courses have diversified in form and function. For example, they can range from short-term, one week or less, to more involved experiences that span an entire academic year (Strange & Gibson, 2017).

Currently, the percentage of undergraduate students who have participated in an international educational experience is limited; however, this number is expanding rapidly (Institute of International Education (IIE, 2019). For example, in the 2017-2018 academic year, 341,751 U.S. undergraduate students engaged in an international educational experience, a 2.7% increase over the previous academic year, but a figure that only accounted for about 2% of all undergraduate students in U.S. higher education (IIE, 2019). As such, additional evidence is needed to help substantiate study abroad courses as an essential element of students’ undergraduate experience, especially in the context of agriculture.

To this point, previous evidence has demonstrated that study abroad courses can yield critical outcomes for students. In particular, students who have participated in such have been shown to have improved capacity for citizenship, emotional growth, and global competence; further, they report a more established sense of career awareness and personal identity (Reilly & Senders, 2009; Roberts & Edwards, 2015, 2016; Vanden Berg & Schwander, 2019; Schlarb, 2019). Therefore, study abroad courses have been advanced as a vital component of students’ personal and professional development during their academic careers (Blake-Campbell, 2014; Seifen, Rodriguez, & Johnson, 2019). For example, Briers, Shinn, and Nguyen (2010) reported that one of the primary motivators for agricultural undergraduate students to study abroad was that they perceived the experience could help advance their career. In response to such findings, much of the recent literature has focused on understanding other factors that either encourage or avert agriculture students from enrolling in study abroad courses (Bunch, Blackburn, Danj, Stair, & Blanchard, 2015; Danj, Bunch, & Blackburn, 2015; Estes, Hansen, & Edgar, 2016; Raczkoski, Robinson, Edwards, & Baker, 2018; Roberts, Rampold, Ramage, & Komunjero, in press). As a result, we now understand that undergraduate agriculture students are primarily intrinsically motivated to engage in such activities; however, their perceived beliefs about the cost and value of study abroad courses also affect their decision to enroll (Raczkoski et al.,
Because many undergraduate students do not engage in global learning experiences until their junior or senior year (IIE, 2019), it is critical for colleges of agriculture to communicate the opportunities and benefits associated with such early in students’ undergraduate degree programs. Further, faculty should purposefully design courses to ensure that students’ learning experiences abroad support their desired outcomes (Estes et al., 2016).

To achieve this, university faculty should become more familiar with how to design and deliver study abroad experiences in ways that effectively align with students’ needs and expectations (Hartman & Kiely, 2014). Perhaps the most commonly used instructional practice to ensure that such outcomes are achieved is through embedding critical reflection in the study abroad experience (Whitney & Clayton, 2011). Critical reflection refers to the practice of having students deeply ponder their experiences and question how their views of the world should grow and expand in the future (Roberts, Stair, & Granberry, in press). The use of critical reflection has been shown to catalyze essential processes, particularly in the affective domain of learning (Ash & Clayton, 2009a). As a result, reflection often serves as a primary mechanism by which faculty can effectively facilitate students’ shifts in understanding and also help them to productively construct meaning from their experiences abroad (Ash & Clayton, 2009b).

In a global context, reflection also helps open up opportunities for faculty to address potentially problematic outcomes that emerge as a result of students’ interactions in their host country such as misinterpretations of the actions of others, the reinforcements of negative stereotypes, and ill-informed judgments (Whitney & Clayton, 2011). As a result of these new understandings, students may also begin to grapple with their experiences and begin to reconsider previously held perspectives and worldviews (Kiely, 2004, 2005). To achieve this, however, requires that reflective sessions in study abroad courses be designed intentionally to allow students to question their underlying beliefs and values – a concept Mezirow (1991) called dissonance. Mezirow (1991) explained that when individuals reflect on dissonance, it could spur a powerful learning process, called transformational learning (TL), by which individuals’ previously held worldviews are transformed. O’Malley, Roberts, Stair, and Blackburn (2019) reported that university students experienced four forms of dissonance during a study abroad course to Nicaragua: (1) environmental, (2) sociocultural, (3) personal, and (4) intellectual. And, as a consequence of such dissonance, they experienced a transformation of their perspectives (O’Malley et al., 2019). However, a need existed to understand whether agriculture students in study abroad courses in other contexts and at varying durations of time experienced similar forms of dissonance.

**Theoretical Framework**

We grounded this investigation in Mezirow’s (1978, 1991, 2000) transformational learning theory (TLT). TLT lies at the intersection of adult learning theory and seeks to explain how individuals make meaning of their experiences and how such can lead a perspective transformation on an issue or topic (Mezirow, 1991). Through the lens of TLT, this process unfolds after an individual is introduced to alternative beliefs and perspectives that conflict with their previously held worldviews, a phenomenon described by Mezirow (2000) as a disorienting dilemma or dissonance. Mezirow (1991) theorized that after individuals experience dissonance and assign meaning to this experience, it has the potential to mature an individual’s previously held beliefs and values (Mezirow, 1991, 2000). Because of its emphasis on individual change, TLT has served as a critical tenet of study abroad programming over the past decade (Bell,
Despite this, however, the theory has been critiqued by scholars and practitioners who argue that transformative outcomes vary significantly due to context, duration, and other programmatic features (Bell et al., 2016; Strange & Gibson, 2017). As an illustration, Perry, Stoner, and Tarrant (2012) advanced the notion that short-term study abroad courses, generally lasting two weeks or less, can serve as a vehicle to elicit transformative shifts in undergraduate students’ perspectives. However, a quantitative analysis of similar factors reported that short-term study abroad courses only demonstrated negligible outcomes (Dwyer & Peters, 2004). As a result, Dwyer and Peters (2004) argued that more long-term experiences abroad are needed to transform students' perspectives effectively. In response to such conflicts, researchers have noted the importance of purposefully designing study abroad courses in ways that allow students to experience dissonance and assign meaning to such, regardless of programmatic features, through critical reflection (Strange & Gibson, 2017).

On this point, Kiely (2004) theorized the dissonance students grapple with during study abroad courses influences the transformation they undergo. For example, as they observe differences regarding their host country’s customs, dress, language, and other traditions, students begin to consider how this knowledge stands in contrast to their existing frame of reference (Kiely, 2004). Further, as they engage with more profound dissonance, such as economic disparity, gender bias, human welfare, illness, and racial issues, it often sparks a sense of disequilibrium, and students begin to reexamine their existing perspectives and adopt a more mature view of the world (Kiely, 2005). Therefore, students' experiences abroad become a crucial turning point in which their perspectives are influenced by the dissonance they encounter (Kiely, 2004). For example, O’Malley et al. (2019) theorized that the four forms of dissonance – environmental, sociocultural, personal, and intellectual – students experienced during a study abroad course to Nicaragua shaped the perspective changes they underwent as they developed a more mature understanding of “global issues and problems in agriculture” (p. 199; see Figure 1). Nevertheless, more knowledge is needed to describe how contextual and other programmatic features influence the forms of dissonance that initiate transformational learning. As a consequence, we required agriculture majors to process their experiences during study abroad courses to Costa Rica and Thailand through reflective exercises.

**Background and Setting**

In this investigation, we analyzed study abroad courses led by faculty in the College of Agriculture at Louisiana State University to Costa Rica and Thailand in 2019. The courses had similar focuses; for example, each featured opportunities to learn about agribusiness, production practices, higher education, as well as discussions and experiences that highlighted the role of policy on agriculture. Further, each study abroad course allowed students to engage in unique cultural excursions while also interacting with locals who exposed them to each country’s unique customs and traditions. However, the courses also differed in two key aspects: context and duration. Nevertheless, students had similar assignments and expectations.

During the week-long study abroad course to Costa Rica, students visited several agrotourism industries, including dairy, coffee, wildlife sanctuaries, and national parks. Students also toured E.A.R.T.H University, a private, non-profit university that focuses on agricultural sciences, sustainability, and experiential learning. It should also be noted that Costa Rica is more developed than other countries in Central America, such as Guatemala and Nicaragua. Therefore,
students had the opportunity to observe more contemporary approaches to agriculture than would be experienced in other destinations in Central America. The second study abroad course under investigation occurred in Thailand over four weeks. During this course, students visited multiple agrotourism and Royal Project sites that featured research and innovation in agricultural production. Students also had in-depth learning experiences at Chaing Mai University by which they were exposed to innovative production practices as well as Extension services that targeted Northern Thailand’s Hill Tribe farmers, among other stakeholder groups.

In both study abroad courses, students were required to reflect daily using the smartphone application ReCap®. Using this application, students captured their daily thoughts and experiences regarding (a) what they learned, (b) what was different from their experiences in the U.S., (c) what was similar, and (d) if anything caused them to feel discomfort. Students in both courses were also required to submit a portfolio and create a presentation in which they shared their key experiences and the most impactful moments. Therefore, the design of the courses under investigation greatly influenced our collection of data as well as the purpose of the study.

Purpose and Research Question

This investigation’s purpose was to compare and contrast the forms of dissonance experienced by agriculture majors at Louisiana State University during study abroad courses to
Costa Rica and Thailand. One research question framed this investigation: In what ways did agriculture students at Louisiana State University experience similar but distinct forms of dissonance during study abroad courses that varied regarding context and duration?

Methods

To achieve the purpose of the study, it was critical to reveal how our biases, prejudices, and relevant experiences shaped this investigation. For example, two of the researchers were faculty at Louisiana State University and were responsible for the design and facilitation of the study abroad courses under investigation. The other researchers were graduate students whose studies focused on international agriculture and global education. It should also be noted that one of the graduate students participated in all activities and experiences associated with the Thailand study abroad; therefore, she served as an additional participant observer (Patton, 2002). Further, all researchers had previous international experience and had facilitated or participated in study abroad courses before data collection in Costa Rica and Thailand. The combination of these backgrounds greatly influenced our collection and analysis of the data, especially regarding how we interpreted participants’ lived experiences and the dissonance they endured. As a consequence, our positionality in this investigation greatly influenced our methodological decisions.

When approaching this investigation, we used a constructionism epistemological position to guide our assumptions and investments (Crotty, 1998). As a result, we chose to ground this study in Stake’s (2006) multiple case study design. Using this approach, we gained a more in-depth understanding of the central issue, or quintain, regarding the dissonance experienced by participants during study abroad courses to Costa Rica and Thailand. The multiple case study approach helped describe the dissonance experienced by participants from varied perspectives to achieve a more granular portrayal of the phenomenon (Stake, 2006). To achieve this, we collected data from agriculture students (N = 21) at Louisiana State University to create a description of each case. Thereafter, we conducted a cross-case analysis to compare findings and describe how they converged and diverged across cases (Stake, 2006). As such, our goal was not to generalize from the study’s findings (Stake, 2006). Instead, we intended to provide a metainterpretation to describe how the results might be transferable to other study abroad courses (Grandy, 2010).

Description of the Cases, Participants, and Data Sources

To examine the dissonance, we bounded cases by academic college, degree level, and year (Stake, 2006). For example, all of the students were undergraduate agriculture students at Louisiana State University who participated in a study abroad course offered through the College of Agriculture in 2019. Although these factors bounded cases, they were also distinct in two ways: context and duration. As an illustration, in the first case, students’ experiences abroad occurred in Costa Rica for one week; however, in the second case, students studied in Thailand over four weeks. In total, 10 females and three male students comprised Case #1 – The Costa Rica Study Abroad Course (n = 13). Meanwhile, five females and three males represented Case #2 – The Thailand Study Abroad Course (n = 8). It is important to note that participants were only enrolled in one study abroad course, i.e., no student participated in both courses under investigation. Further, students’ previous international experience varied considerably within each case. After Institutional Review Board (IRB) approval, students were briefed about the purpose of the study. At that time, they signed an electronic disclosure form indicating their
agreement to participate. Then, during each study abroad course, the participants were required to record at least one daily video reflection; however, some students submitted more than one upload per day. To capture video reflections, we used the smartphone application ReCap®. Although students’ video reflections served as the primary source of data in this investigation, we also used observations and fieldnotes to triangulate findings (Patton, 2002). Of note, the number of daily video reflections was impacted by technological difficulties experienced by students, which included an unstable Wi-Fi connection during both study abroad courses. Therefore, some students did not submit all of the required reflections. Despite this, a total of 344 video reflections (Case #1 = 103; Case #2 = 241) were submitted across cases. To facilitate analysis, all data – including videos, field notes, and memos – were transcribed verbatim. Then, students’ names were removed from transcripts to ensure anonymity. Thereafter, we assigned students a participant number to maintain a thorough audit trail.

Data Analysis

To analyze the data, we used Corbin’s and Strauss’ (2015) constant comparative method through the use of the following coding procedures: (a) open, (b) axial, and (c) selective. To accomplish this, we uploaded all data into NVivo® qualitative analysis software. The open coding phase involved three separate open coding techniques: (1) descriptive, (2) in vivo, and (3) emotion coding (Saldaña, 2016). During this phase, emotion coding served as the most productive technique because it helped map students’ emotional journeys as they encountered dissonance and began to make meaning regarding how their perspectives were transforming during their study abroad course. For example, the following emotion codes emerged during our analysis: (a) excited, (b) confused, (c) disturbed, (d) surprised, and (e) tensed. After each round of open coding, we also created analytic memos to capture our emergent assertions and interpretations of the data (Saldaña, 2016). In the second phase of analysis, we engaged in axial coding (Corbin & Strauss, 2015). Axial coding is a process by which researchers reduce the data generated in the open coding phase into distinct categories (Corbin & Strauss, 2015). Therefore, we scrutinized relationships among all open codes using code weaving and data displays to arrive at categories for each case. This process also allowed us to more intimately explore discrepancies between the data units and categories and consider alternative interpretations (Stake, 2006). After considering rival explanations, we then created evidentiary warrants, grounded in the data, which helped to create individual case reports (Stake, 2006). In our final phase of analysis, we used selective coding as a way to analyze our axial codes and case reports by thinking with theory (Corbin & Strauss, 2015). As a consequence, themes emerged in individual cases by interpreting them through the lens of Mezirow’s (1991, 2000) TLT. Finally, to compare and contrast the dissonance experienced by students in each case, we engaged in cross-case analysis procedures. Next, we describe how we upheld rigor in this study.

Standards for Qualitative Quality

To ensure that we embued quality in this study, we used Lincoln’s and Guba’s (1985) standards for trustworthiness: (1) credibility, (2) transferability, (3) dependability, and (4) confirmability. As such, we ensured that credibility was embedded throughout this study by (a) providing thick, rich descriptions of the findings, (b) mobilizing alternative viewpoints and rival explanations, and (c) linking data to existing research and theory. The second standard, transferability was achieved by (a) outlining the characteristics of the participants and the study abroad courses in which they engaged, (b) detailing how cases were bounded and the resulting
implications, and (c) were transparent about the limitations of the study, especially regarding data collection and analysis. Dependability, the third standard, reflected the ways in which we (a) revealed how our positionality shaped the study’s design and procedures, (b) were explicit about the study’s purpose, and (c) upheld a systematic audit trail. Finally, we promoted confirmability by (a) providing our reflexivity statement, (b) fully described our data collection and analysis procedures, and (c) ensured that all findings and conclusions were connected to data. Our discussion of the study’s findings is provided next.

Results

Through our analytic work, three themes emerged in each case. The themes represented the forms of dissonance experienced by agriculture majors at Louisiana State University during study abroad courses to Costa Rica and Thailand. Although two forms of dissonance were consistent across cases, variant forms also emerged. When interpreted through Mezirow’s (1991, 2000) TLT, each theme described how students’ perspectives began to expand and mature as a result of their experiences abroad. However, it should be noted that the forms of dissonance identified in this investigation occurred at varying levels of intensity and points in time during each study abroad course. In our description of each theme, we drew on case reports and participants’ words within cases to situate our findings. Finally, at this report’s conclusion, we offer a meta-interpretation as a result of our cross-case analysis (Stake, 2006).

Case #1: The Costa Rica Study Abroad Course

In April 2019, 13 agriculture students from Louisiana State University engaged in a study abroad course to Costa Rica for one week. During the course, students had experiential learning opportunities on topics that included: (a) agricultural business, (b) agricultural policy, (c) agrotourism, (d) Hispanic culture, and (e) production agriculture. Based on these experiences, students articulated the dissonance they encountered during moments of critical reflection. Next, we offer our interpretation of the three forms of dissonance distilled from this case through the lens of Mezirow’s (1991, 2000) TLT: (1) environmental, (2) intellectual, and (3) moral.

Environmental Dissonance.

Throughout the study abroad course, students noted that environmental differences existed between the United States and Costa Rica. For example, students explained they were largely surprised by differences regarding the climate, geography, and wildlife and their existing frames of reference. As an illustration, Participant #5 shared, “It just so different here… the mountains, the humidity, the wildlife, the driving…it’s just a lot different than what I’m used to in the United States.” Further, Participant #7 added, “I was surprised how beautiful and clear the water was. I’ve never seen water like that before in the United States.” Other students made a note of how environmental differences had implications for agriculture as well. For example, Participant #3 explained, “Because the climate is different, people in Costa Rica really have to approach farming and agriculture differently. It is just something that had not really crossed my mind.” As students made sense of the environmental dissonance they experienced, they also began to notice key contrasts regarding their existing knowledge and what they gained exposure to during their experiences in Costa Rica.

Intellectual Dissonance.

During the study abroad course, the students also described how they experienced discrepancies concerning their knowledge and practices, i.e., intellectual dissonance. In particular, students encountered new agricultural practices and modes of teaching in Costa Rica.
that differed from those they had been exposed to in the U.S. For instance, after visiting E.A.R.T.H University they experienced a different model to teaching and learning in which students at E.A.R.T.H acquired agricultural knowledge through “practical experiences rather than theory-based lectures. It just made me consider a different way of gaining agricultural knowledge” (Participant #2). Further, students also noted differences regarding agricultural practices found in Costa Rica in comparison to the United States. Participant #6 explained, “agriculturalists place a lot more emphasis on sustainability than those in the United States. They just really make it a priority here.” After rendering meaning from these intellectual disparities, students began to consider whether dimensions of their moral values should be modified.

**Moral Dissonance.**

The final theme for the first case, moral dissonance, reflected how students began to reenvision their sense of moral obligation as a result of their experiences in Costa Rica. For example, after gaining exposure to sustainable practices, they began to articulate how they began to sense a moral duty to integrate sustainable practices into their daily lives. As an illustration, Participant #4 revealed, “their [Costarian people’s] commitment to sustainability has made me reflect on the impact of my own decisions more. I guess it makes me want to do better in the future.” Similarly, Participant #1 shared, “people in Costa Rica are really trying to make the Earth a better place through agriculture. When I go back home, I need to make some changes so that being more sustainable is a bigger priority in my life.” As a consequence, students’ perspectives on agriculture began to grow and evolve.

**Case #2: The Thailand Study Abroad Course**

The second case draws on the experiences of eight agriculture students during a study abroad course to Thailand in the summer of 2019. Throughout the course, students engaged in experiential learning on the following topics: (a) agricultural business, (b) agricultural policy, (c) agrotourism, (d) production agriculture, and (e) Thai culture. Our interpretation of the dissonance students experienced during is interpreted through the lens of Mezirow’s (1991, 2000) TLT.

**Sociocultural Dissonance.**

After arriving in Thailand, students began to articulate stark sociocultural differences between Thailand and the United States. In particular, students spoke to how their experiences with various customs and traditions of Thai society challenged their existing perspectives. For example, Participant #15 shared:

I did not think the food would be so unfamiliar. I knew that they, of course, would have different dishes, but I did not know that they would have vegetables and fruits that I had never heard of. Overall, it has also been an interesting adjustment to the food…

Other aspects of Thai society appeared to stoke dissonance for students as well. For example, in our fieldnotes, an emergent pattern was that differences in the country’s customs regarding travel challenged students. In a video reflection, Participant #20, provided more insight into this concept, “One aspect that shocked me here [in Thailand] is the traffic... there are motorbikes flying in between the lanes, and Thai people are just fearless. It’s like a death trap.” Students also described how navigating a Buddhist culture challenged their existing frames of reference. Participant #17 explained, “In America, a lot of times people come off as really frustrated. Whereas in Thailand, because it’s a Buddhist culture, they place more emphasis on acceptance. It’s hard to explain, but it's really made me think.” As students assigned meaning to their sociocultural dissonance, however, they began to ponder other differences more deeply as well.
Intellectual Dissonance.
After learning more about agriculture in Thailand, students perceived their existing knowledge and frames of reference were incomplete. For instance, after visiting the Hill Tribe farmers in northern Thailand, Participant #14, compared his knowledge of agriculture in the U.S. to the practices he had observed:

I am just so shocked by the agriculture here. I mean I grew up on a farm in Louisiana so I thought I knew a lot about agriculture and food production...[but] they have two or more crops growing on the same land whereas we usually only have one. The little spaces are still used for the farm...they [the Thai people] are really smart and efficient.

These shifts in students’ perspectives extended to other aspects of production agriculture as well. For example, Participant #16 explained: “Today was pretty mindboggling for me. I mean I have seen and done composting before, but vermicomposting [composting with worms] completely blew my mind.” Consequently, students intellectual shifts appeared to help them began to reassess values and other principles they had not previously considered.

Moral Dissonance.
The final theme that emerged from students’ experiences in Thailand was moral dissonance. Moral dissonance referred to the ways in which students began to critically examine their prior values and consider whether they should adopt a new perspective moving forward. In his final video reflection, for example, Participant #21 shared:

I think my biggest takeaway has been how everyone here, even those who aren't directly involved in agriculture, are dedicated to living more sustainably. In the United States, we are kind of all talk. But everyone here seems to have this ethical obligation to do better.

Similarly, Participant #18 began to make comparisons between the values espoused by individuals she encountered in Thailand and those in the United States. And, as a result, she pondered how to could adopt such values into her daily life. She explained: “I just keep thinking about the values of the Thai people. When I go home, I hope to have a greater appreciation for the environment. It has just given me a lot to think about.” As a consequence, students’ new sense of moral obligation seemed to foment critical perspective changes.

Cross-Case Analysis
A cross-case analysis (Stake, 2006) of the study’s findings illuminated key convergences and divergences regarding the dissonance students experienced during their study abroad courses when interpreted through the lens of Mezirow’s (1991, 2000) TLT. In particular, two forms of dissonance were consistent across cases: (1) intellectual and (2) moral. However, additional forms of dissonance also emerged within each case. Therefore, the observed differences appear to illuminate the role of context and duration in facilitating key student outcomes. Table 1 provides an outline of the study’s cross-case comparison of themes.

Table 1
A Cross-Case Comparision of the Forms of Dissonance

<table>
<thead>
<tr>
<th>Theme</th>
<th>Description</th>
<th>Case #1</th>
<th>Case #2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental</td>
<td>Differences students noted regarding the climate, geography, and wildlife with their existing frames of reference.</td>
<td>✔</td>
<td>✗</td>
</tr>
</tbody>
</table>
## Conclusions and Implications

The purpose of this study was to compare and contrast the forms of dissonance experienced by agriculture majors at Louisiana State University during study abroad courses to Costa Rica and Thailand. To fulfill this purpose, we interpreted the study’s findings through the lens of Mezirow’s (1991, 2000) TLT. This process helped describe how the dissonance students’ underwent fomented key shifts in their perspectives because of their experiences abroad. Then, through a cross-case analysis (Stake, 2006) of the study’s findings, we found that two forms of dissonance were similar across cases: (1) intellectual and (2) moral. However, students who studied abroad in Costa Rica also experienced environmental dissonance; meanwhile, those enrolled in the Thailand course encountered dissonance that was more sociocultural. We conclude, therefore, that although study abroad courses can facilitate similar results when designed purposefully, context and duration also profoundly shape students’ outcomes. Such findings are significant considering that providing quality experiential and international learning opportunities has been reported to influence individuals’ decision to pursue an agricultural-related degree (Alston, Roberts, & Warren English, 2019, 2020).

The literature on study abroad courses in agriculture has primarily focused on documenting why students participate (Bunch et al., 2015; Danjean et al., 2015; Estes et al., 2016; Raczkoski et al., 2018; Roberts et al., in press). However, by offering a more granular depiction of the dissonance students experience across two study abroad courses, we provided a stronger basis for documenting students’ shared outcomes, which is a critical deficiency in the broader study abroad literature (Blake-Campbell, 2014; Hartman & Kiely, 2014; McCabe, 2001; Ogden, 2007). As a result, it is important to provide conclusions for each form of dissonance identified in this investigation. First, environmental dissonance represented the differences students noted regarding the climate, geography, and wildlife with their existing frames of reference in Case #1: The Costa Rica Study Abroad Course. Consequently, this finding aligns with those reported by O’Malley et al. (2019) regarding how students begin to notice key environmental differences after engaging in a new culture. However, this form of dissonance did not emerge from our analysis of students’ experiences in Thailand. Similarly, sociocultural dissonance, or the ways in which customs and traditions challenged students’ existing perspectives (Kiely, 2004, 2005), was limited to the experiences of students in Case #2: The Thailand Study Abroad Course. As a result, we conclude that both environmental and sociocultural dissonance appear to be more contextually-based and may not be transferable to all study abroad courses – a concept not currently reflected in the broader literature. Students also articulated they experienced intellectual dissonance, or discrepancies regarding their existing knowledge, as they encountered new concepts, practices, and innovations in Costa Rica and

### Table: Theme and Description

<table>
<thead>
<tr>
<th>Theme</th>
<th>Description</th>
<th>Case #1</th>
<th>Case #2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intellectual</td>
<td>Discrepancies students experienced regarding agricultural knowledge and practices.</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Moral</td>
<td>Reflected how students began to reenvision their sense of moral obligation as a result of their experiences abroad.</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Sociocultural</td>
<td>Represented how customs and traditions challenged students’ existing perspectives.</td>
<td>❌</td>
<td>✔</td>
</tr>
</tbody>
</table>

*Note. Not present = ❌; Present = ✔.*
Thailand that seemed to stand in contrast to their previous knowledge of U.S. agriculture. This finding supports those reported by O’Malley et al. (2019). However, the final form of dissonance, moral, does not appear to have been explored previously. Moral dissonance represented how students began to reenvision their sense of moral obligation as they contemplated integrating new values into their daily lives because of a maturation in their perspective as a result of their experiences in their respective study abroad courses. As such, moral dissonance warrants further examination.

**Recommendations and Discussion**

This multiple case study provided additional documentation that study abroad courses, at varying durations, can facilitate perspective transformations for university agriculture students (Mezirow, 1991, 2000). However, in comparison to the findings reported by O’Malley et al. (2019), across cases an additional form of dissonance, moral, emerged, but personal dissonance did not. As such, we recommend that more research be dedicated to examining the dissonance that students undergo during study courses. For example, future investigations should seek to describe whether such transformations are actualized in students’ daily lives after they return to the U.S. On this point, we recommend that additional work be dedicated to understanding effective processes that students can use to transfer the positive outcomes they acquire abroad into their academic, personal, and professional lives. Further, because the perspective transformations that students articulated in this investigation often led to them questioning their personal lifestyles, we also recommend that administrators and faculty who lead study abroad courses carefully consider students’ post-experience and ponder whether students need additional support. Perhaps by creating a space in which students continue to make sense of their experiences abroad by learning to integrate their altered perspectives into their lives, more powerful long-term change can be achieved. We also recommend that follow-up interviews be conducted with students over time to examine the long-term effects of the perspective changes students acquire because of studying abroad (Kiely, 2005).

In this investigation, several unexpected practical and ethical considerations also emerged that warrant future examination. For instance, as students critically reflected on their dissonance, they began to question deeply entrenched assumptions about themselves, relationships with others, agricultural practices, and societal issues and problems. This approach, therefore, is overtly hegemonic, i.e., a process by which students begin to critically assess the world’s existing structures of power (Hartman & Kiely, 2014). Therefore, we caution faculty who lead study abroad courses to carefully consider the challenges embedded in using a critical reflection approach. In particular, before adopting such a practice, faculty should plan to navigate complex discussions with students that could potentially involve issues regarding access, agency, ethics, gendered roles, morality, power, privilege, race, among others. In response, we recommend that faculty development opportunities be created in which practitioners with transformative intentions for their study abroad courses begin to learn how to facilitate such using ethical and productive approaches for students. These faculty development opportunities could also foster important dialogue that could help clarify the contextual and programmatic factors that are likely to catalyze as well as hinder students’ perspective transformations.

In the study abroad literature, short-term experiences have been critiqued as lacking academic rigor, intensity, and the immersive experiences students need to acquire quality outcomes (Dwyer & Peters, 2004). This study’s findings, however, provide additional evidence that short-term study abroad experiences hold transformative potential for students if designed
and delivered effectively. Moving forward, we recommend that administrators and faculty consider the design and delivery of the study abroad courses detailed in this investigation to awaken transformative learning for their students.

References


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