Experiential Learning Modules: Its Contribution in Developing Teaching Curricula in International Agricultural Development Courses

by

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A dissertation submitted to the Graduate Faculty of

Auburn University

in partial fulfillment of the

requirements for the Degree of

Doctor of Philosophy

Auburn, Alabama

December 14, 2019

Keywords: Experiential Learning, Food Security, Curriculum

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ACKNOWLEDGEMENTS

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ABBREVIATIONS

CVET   Centre Vocationnel et Technique (Center for Vocational and Technique)

ELM   Experiential Learning Modules

NGO   Non-Governmental Organization

USAID   United States Agency for International Development

DAI   Development Alternatives, Inc.

FAO   Food and Agricultural Organization

DCAL   Dartmouth Center for the Advancement of Learning

ECELDP   Envision Career Exploration and Leadership Development Programs.

ISL   International Service Learning

CE   Concrete Experience,

RO   Reflective Observation,

AC   Abstract Conceptualization,

AE   Active Experimentation

Chapter 1 : Overview

Agricultural education is a challenge for educators without the immersion of experiential learning (Nooghabi, Iravani and Fami, 2011). Agricultural educators across high schools, universities, and informal agricultural education programs such as extension services have emphasized the benefits of experiential learning for taking full advantage of the potential of education by training students and professionals who can contribute towards the ever-changing fields (Roberts & Ball, 2009., John et. al., 2015).

Experiential learning is about constructing knowledge and meaning from real-life experience, which permits the progress of new theories through new understandings. Roger (1969) stated that experiential learning allowed students to reach their "natural potential of learning" by preparing them for leadership and proactive community engagement (p.114).

Experiential Learning Modules (ELMs)

Kolb (1984) defined learning as "the process whereby knowledge is created through the transformation of experience" (p.38). Grounded on Kolb's experiential learning model, experiential learning modules (ELMs) were developed and based on the four adaptive modes of the Kolb`s Learning Cycle, which are concrete experiences, reflective observations, abstract conceptualization, and active experimentation (Figure 1-1).
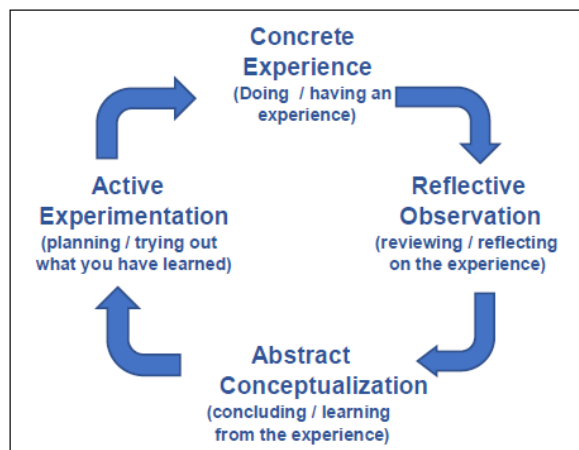
Figure 1-1: The Kolb's learning cycle (reproduced from McLeod 2013)

The ELMs were developed under the project "Developing Global-Ready Agriculturists through Experiential Learning Modules: Solving Problems of Food Insecurity & Human Suffering in Haiti", which was funded by the USDA Higher Education Challenge Grant. Through three short ISLs trips (one week each) from May 2016 to May 2017, 24 ELMs were developed by 15 graduate students, enrolled in agricultural developmental programs at Texas A&M University, Auburn University, and Sam Houston University, through an authentic immersive experience in Haiti. This project favored a community based participatory approach which involved the local community, the organizational representatives of the Christianville Foundations Inc. and researchers who were the developers of the ELMs.

The Kolb's learning cycle framework was used for studying the phenomena of food insecurity, which has an inductive and deductive approach. The data were collected through participant observations. The developers of ELMs and I immersed ourselves in the setting, recorded data and observations, and consolidated the information gathered. The data were collected through field notes, observations, interviews, conversations, photographs and group meetings from people who were affiliated to the Christianville Foundation Inc. across the region of Gressier.

An ELM is a combination of pictures, videos, and a voice-over presentation to relay the experience in a lively way for the classroom learner. The purpose of this project was to "prepare scientists and leaders for increasingly globalized food, agriculture, natural resources, and human health systems by developing and incorporating ELMs into international agricultural development graduate courses" (Briers, 2017).

The ELMs are instructional materials with educational objectives. They identified the causes pertaining to food insecurity and human suffering and the problems and challenges of the

agrarian community. The researched topic was contextualized, and a theory tested. The final step, active experimentation (Figure 1-1) led to potential solutions for problems identified where they could be tested in real life, creating new experiences.

The study of ELMs is considered suitable for courses such as agricultural education and extension methods, research methods for social sciences, rural sociology, political economy and program planning, which are related to international agricultural development. Incorporating ELMs would help students to better understand career opportunities and educational options (Faulkner, Baggett, Bowen and Bowen, 2009). The benefits of International Service Learnings (ISLs) are well documented in the fields of business and medicine, but remain limited for agricultural education.

Haiti as Context for ELMs

Haiti remains the poorest developing country in the western hemisphere and provides most of the challenging conditions that international development professionals may encounter in future work. For this project, it provided a suitable context for learning, experiencing, and understanding problems related to food insecurity, malnutrition, and human suffering.

More than 70% of the people in Haiti live under the poverty level with agriculture employing only 38% of the population. In addition, 40% of the population were unemployed or irregularly employed (CIA, 2016). The development of the ELMs took place in the facilities of two non- governmental organizations in rural communities outside Port-au-Prince (Figure 1-2). They are the Live Beyond Foundation and the Christianville Foundation Inc., situated in the region of Thomazeau and Gressier, respectively.

Figure 1-2: Locations of NGOs where ELMs were developed

Since most of the graduate students were from the United States, there was an intercultural

language barrier, which was overcome by having translators when required. The work was

published on the Texas A&M University website with all specific projects that link well to the

skills and knowledge of the ELMs. The ELMs were built to be incorporated into graduate

programs` curricula to prepare students from diverse backgrounds to solve globally interconnected

issues, such as the future food insecurity challenges of poor communities (Briers, 2017). The ISL

also provided the authors of ELMs and faculty members a short-term total immersion in a poor

developing country. These developmental problems have an impact on the economy, security, and

human health of the U.S. as well.

There is a career exploration component in the ELMs that describes the types of employment opportunities and competencies required, along with the tasks that need to be performed. Overall, it presented international agricultural development opportunities in related occupations. This section allows the public at large to participate in related fields of work by either participating in research work or working towards the deliverables of solving the problems of poverty and food insecurity.

Christianville Foundation Inc. and Thomazeau Foundation

Most of the ELMs were developed at the Christianville Foundation Inc. in the Gressier region, which was established in 1978. They provide outreach programs to the poor through their volunteers, students, workers, and ministry partners. It is a guarded compound over 35 acres and is 99% Haitian staffed. They operate four primary schools, an adult technical school (mainly agricultural), children's feeding program, pastoral outreach, agricultural extension outreach programs and work with eight churches throughout Haiti. They also provide health care through their school medical clinics and a safe platform for missionary groups and university staff. The purpose was to involve the local people in directing the projects, developing economic opportunities which would hereby reduce foreign-aid dependency. The Live Beyond Foundation provided health care, clean water, education, orphan care, and community development to the poor in the region of Thomazeau.

The Christianville Foundation Inc. provided a safe platform for the participants who collaborated well during the research work. They also provided lodging and daily meals to participants in their newly constructed kitchen/dining hall.

The two NGOs already consented for the research work to be carried out during the early phases when the project was being developed. Informal settings, and field observations were the primary sources of information, which were supported by additional research online (Creswell,

2013). Observations that we took in the field were in the form of data such as written notes, recordings, descriptive statistics, field notes, interviews, conversations, photographs and group meetings.

Before finalizing the ELMs, the modules developed by the graduate students were discussed and validated by the NGOs and faculty representatives. This was carried out to ensure that we have met the educational objectives of the project, which should benefit the local community as well. This assurance of reciprocity was an essential part of our study and the research framework employed made the task crystal clear.

The experiential learning in Haiti helped the students to better understand the socio-economic, cultural, and political situations under which the population lives. This project addresses the educational need areas of curriculum development, instructional delivery systems, international experiential learning, and expanding student career opportunities. The incorporation of ELMs in international agricultural education curricula, with focus on extension and outreach programs and projects planning, is timely and rewarding.

The development of ELMs allows experiential learning prospects for the students involved in the ISL as well as the potential for providing a vicarious experience for the students within the classroom. The time constraint, cultural and language barrier, and financial aspect of direct learning present a challenge on how much knowledge, understanding and meta-cognitive skills can be acquired through the action research during the short ISL. This constitutes the scope of evaluating the impact that EL had on the students during the ISL.

ELMs were developed with the objective to be incorporated into international development courses or for developing additional curricula based on them. This brings the notion of vicarious learning within a classroom setting that needs an effective instructional delivery

system for the best pedagogical learning. The delivery method and tools proposed for teaching the ELMs, along with their assessment, would improve and contribute towards realigning the tools for better educational impact. A model and method of delivery of educational materials were proposed and implemented into the Rural Sociology course in Auburn University.

This ISL allowed deep immersive experiences. The focus of this community study was about developing potential agricultural projects which would address the problem of food insecurity in Gressier. Therefore, there is a need to understand the underlying factors that are causing food insecurity so that appropriate recommendations are formulated. Since the phenomenon of food insecurity was researched through the development of ELMs, it is important to understand: (1.) What are ELMs and how were they developed? (2.) Why is the region of Gressier food insecure? (3.) What has been the impact of the ISL on the students? (4.) How can we use the ELMs in a classroom setting? First, there is a need to describe the lively experiences through a phenomenological study on food insecurity, to determine why the region is food insecure and what the main causes are. Second, to develop and propose the instructional delivery system of how to incorporate the ELMs in international agricultural development courses along with evaluations. Third, to evaluate and assess the benefits of the experiential learning for the developers of ELMs.

Organization of the Thesis

These research questions will be answered by this dissertation and consists of three chapters.

The first chapter is entitled "The Narrative and Phenomenological Study of Food Insecurity through International Service Projects in Haiti". It uses a social constructivist approach, based on the experiences and lessons learned. This study will explain what ELMs are and how they were conceived. It captures living experiences, feelings, observations made, perceptions and realities of

the ISL, intercultural adaptation, and resilience of the local people. This qualitative study examines the reasons and factors that are causing the problem of food insecurity in the region of Gressier and the formulation of recommendations for solving the issue.

The purpose of the study is to investigate on the phenomenon of food insecurity in the region of Gressier. This study addresses these research questions below using the Kolb's learning cycle as a framework:

(i)   How was the phenomenon of food insecurity researched in Gressier?

(ii)   Why is the region of Gressier food insecure?

(iii)   What does it mean to be food insecure to the community of Gressier?

(iv)   What are the potential solutions for combating food insecurity in Gressier?

This investigation captures the details of the rich experiences with the community, as well their poverty level, socio-economic conditions, cultural history, survival strategies, struggles, hopes and expectations.

The second chapter is a case study on "Experiential Learning Modules for Teaching International Agricultural Development: How to Use the Tools and Assess Their Impact." This study was undertaken with undergraduate and graduate students enrolled in Rural Sociology courses at Auburn University during the Fall 2017 and 2018 semesters. The ELM entitled "Sustainable Management Practices of Plantain in Haiti with Emphasis on the Control of the Disease Black Sigatoka" was used as a case example. This allowed students in the classroom to have a lively experience while learning about international agricultural developmental challenges in developing countries. This study is timely, as there is a need to improve the quality of education and instruction to train students who can contribute towards solving complex problems of international food insecurity and human suffering. This study proposes ways to incorporate ELMs

in teaching curricula with a component focusing on international agricultural development; defining the experiential learning activity design, target audience, optimal point to use an ELM, evaluating pre- and post-reflection surveys and learning assessments from the class exercises, using findings of the 'plantain ELM' as a teaching component and the reactions of students as a guide for revision and realignment of the tool, reflecting on the strengths and limitations of ELMs as a teaching tool and providing suggestions for improving the teaching module and recommending further research for testing the curricula. This will help in recontextualizing the instructional material and delivery system to improve the effectiveness of the teaching methodologies.

The third chapter is entitled "Assessing Change and Consequences of Experiential Learning based on an International Service Project in Haiti". The purpose of this study is to assess the knowledge, tools and meta-cognitive skills acquired by the developers of the ELMs (graduate students) while participating in the short ISL. This research study considered the reflections, critical thoughts, feelings, beliefs, and lessons learned from the experiences. This experiential learning has a social impact that connects the graduate students' learning experiences to the real world. It explores social problems while addressing community-identified needs and providing solutions to agricultural developmental challenges.

The criteria for assessing the EL was determined by evaluating the learning processes while they developed the ELMs, the impact and change and the overall improvement on their meta-cognitive skills, leadership skills, career and mind-set. A conceptual framework was built for that purpose (Figure 4-2). The study consists of a survey design questionnaire, with Likert and open-ended questions to deepen the explanatory nature of the investigation which would be assessing the impact of the EL.

Chapter 2: A Narrative and Phenomenological Study of Food Insecurity across International Services Projects in Gressier, Haiti

Abstract

Food insecurity has been affecting the region of Gressier in Haiti over the past decades due to the inaccessibility and unavailability of food, causing hunger and malnutrition. The purpose of this study is to examine the factors and exact root causes of food insecurity that will lead to the formulation of potential locally adapted solutions. The phenomenon of food insecurity was researched through the Kolb's cycle, while developing experiential learning modules (ELMs). The major cause of food insecurity was associated with poverty. The other reasons of food insecurity were linked to corruptions, natural calamities, climate change, low agricultural productivity, lack of adult education, no credit facilities, and unsustainable agricultural practices such as deforestation and poor soil conservation measures which remained a non-exhaustive list. The people of Gressier were resilient and showed much interest and dedications in agricultural developmental projects. The conditions of food insecurity were explained by the geographic isolations of rural areas affected by erratic climatic factors such as prolonged drought. There was also the lack of institutional support such as health, housing and education that exacerbated the situation. These complex and interrelated factors cumulated towards causing spirals of poverty which in turn contributed to the food insecure condition. The potential solutions for combating food insecurity relied on reviving the agricultural sector. It has been proposed to empower successful NGOs such as the Christianville Foundation Inc. along with the potential for providing an extension service by the CVET (agricultural school) for carrying out agricultural developmental projects.

Keywords: Phenomenology, Food insecurity, Poverty, Extension service, Political-economic structure, Geographic isolation.

A Narrative and Phenomenological Study of Food Insecurity across International Services

Projects in Gressier, Haiti

Introduction

Food insecurity has been affecting Haiti and as well the region of Gressier over the past decades due to the inaccessibility and unavailability of food, causing hunger and malnutrition (USAID, 2018). Food insecurity is "a situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development, and an active and healthy life" (FAO, 2008). Prolonged conditions of food insecurity result in hunger and malnutrition, causing distress among local communities. The last few decades saw international organizations such as the USAID, UN, UNDP, FAO, Feed the People and national governments addressing the problem of food insecurity, in the context of Millennium Developmental Goals (MDGs) now Sustainable Development Goals (SDGs). Food insecurity still remains one of the biggest global challenges. The number of undernourished people in developing countries like Haiti have remained largely constant since the mid-1990s (USAID, 2017). Poverty, compounded by the depreciation of the Haitian gourde, means approximately 4.5 million Haitians struggle to access food (USAID, 2018).

The FAO (2008) addressed food security as a multidimensional concept with overlapping aspects. It characterized four dimensions; food availability (physical access to food), food access (economic access to food), food utilization (absorption of nutrients into the body), and stability (the sustained ability to have enough food). According to the FAO, all four dimensions must be fulfilled to attain food security.

Food insecurity remains a multidimensional phenomenon with multiple realities of why a country or a region is food insecure. On a general basis, natural hazards, conflict, population

growth, poor natural resources, poor crop-based system, poor education, poverty, inaccessibility and unavailability to food have been considered as the main reasons for food insecurity. However, each poor developing country provides a unique perspective and context of food insecurity, which must be addressed distinctively (WHO, 2019).

Haiti, a Caribbean island, sharing the island of Hispaniola with the Dominican Republic is considered among the poorest countries as well the most food insecure in the region. Food insecurity has been the longest challenge for the past decades and the Global Hunger Index rank is still alarming for Haiti. Around 50% of Haitians are still undernourished and the country cannot achieve economic growth and stability without addressing the problem of food insecurity (USAID, 2017). Food insecurity is a debate and challenging issue for most of international and governmental institutions.

Teaching Food Insecurity

This qualitative research undertook of studying the phenomenon of food insecurity in the region of Gressier is novel and involved developing two experiential learning modules (ELM), through an International Service Learning (ISL) program. ELMs are instructional materials with educational objectives. They identified the causes pertaining to food insecurity and human suffering and the problems and challenges of the agrarian community (Briers, 2017).

I actually took part in developing two ELMs to which I make references in this study on how the phenomenon on food insecurity is elucidated. The framework of the Kolb's experiential learning theory (ELT), which is an inductive and deductive approach consisting of a four-stage learning cycle, was used to investigate on the phenomena of food insecurity. The study took a phenomenological approach to describe the chronology of events leading up to the building of the

modules, the living experiences, their meanings, and the lessons learned related to food insecurity and poverty.

The two ELMs I have produced are entitled, "sustainable management practices of plantain in Haiti with emphasis on the control of the disease black sigatoka" and "the potential and role of an extension service in the provision of sustainable farming practices in Gressier : Challenges and scope."

The problem of food insecurity in the rural regions of Gressier in Haiti is intertwined within a complex setting of socio-economic, cultural, environmental and political issues. Food insecurity has been largely interrelated to poverty in Haiti, which often resulted in hunger and malnutrition. The Christianville Foundation Inc. has been involved through the past decades in developing projects for alleviating poverty and food insecurity, relying at times on the support of U.S. Universities for researching and helping them in improving their food and health status.

The purpose of the study is to investigate on the phenomenon of food insecurity in the region of Gressier. This study addresses these research questions using the Kolb's learning cycle as a framework: (i) How was the phenomenon of food insecurity researched in Gressier? (ii) Why is the region of Gressier food insecure? (iii) What does it mean to be food insecure to the community of Gressier? (iv) What are the potential solutions for combating food insecurity in Gressier?

The research work was undertaken with the partnership of the Christianville Foundation Inc. which is an NGO situated in Gressier. This investigation along with its immersive experiences also reflects upon the contributions of the local community to the project through their powerful criticisms, requests, comments, and expectations. It describes the perceptions, the resilience and struggles of the local people and the problems of absolute poverty and food insecurity

This study will also add to the literature of research about food insecurity in Haiti and be the basis for future research work.

Method

The participants undertook a community-based research approach for supporting sustainable communities in Gressier, while fostering their learning experiences for the benefit of the community partners. The service-learning program in Gressier has the objectives of researching the phenomena and needs related to food insecurity through developing ELMs. The phenomenon was researched through the framework of Kolb`s experiential learning theory, which is concerned with the learner's internal cognitive processes.

As a graduate student in Rural Sociology at Auburn University, I made two trips to Haiti in May 2016 and January 2017 and built two ELMs. My 15 years experiences in extension and agricultural development programs helped me better understand the local context. Being also a francophone, with my ability to speak French and Creole as it was the case for Haiti, I was considered an 'external insider' which proved to be critical for the immersive experience (Merriam et al., 2001). It also helped in communicating effectively with the community and minimizing language as a barrier.

Each ELM developer and I operationalized a researchable area we found challenging based on an identified need related to food insecurity. After researching the possible causes of food insecurity, I took an interest in building ELMs that addressed sustainable farming practices and outreach programs for ensuring food security in the Gressier region. Having the background of an extension agent I was in a position to better understand the situation and develop the ELMs. Based on the complex nature of agricultural production and its relation to poverty, the root causes underpinning food insecurity in the region of study were researched through mainly field visits,

group meetings, conversations, interviews, and to some extent the literature. I developed two ELMs on two separate trips that were related to the problems of plantain production and the provision of an extension service in the region of Gressier.

The field visits allowed concrete experiences with new insights at the host sites. The reflective observation phase involved the identification of a need, also based on multiple perspectives of community members. Below is a chronology of the steps undertaken in developing the two ELMs. During each trip, I paired with a faculty member for an authentic experience and through a participative approach we engaged with the community and resources around them, identifying challenges and innovations related to food insecurity and human suffering within the socio-economic, cultural, and political environment of Gressier. We worked on the agreed framework and template to develop each ELMs. Before engaging with the development of the ELMs, we explored the region, studied the local community, the political state and the level of poverty surrounding Gressier, as well as their socio-economic conditions, challenges, and constraints of their daily life.

Texas A&M University developed this research study and also sought the IRB approval. The Christianville Foundation Inc. consented on the research work to be carried out and agreed on the protocol designed during the onset of the project. While in the natural settings, the community participants affiliated to the NGO were not asked to sign any consent form due to the sensitivity of the socio-economic, cultural and political environment. We made sure that other ethics considerations were respected, and that pictures and videos were taken with the verbal consent of the community. We also informed them on how they will benefit from the research work which brings the norms of beneficence and reciprocity.

The Study Area

The research work was undertaken at the Christianville Foundation Inc. and its vicinities in the Gressier region (Figure 2-1). The region is mountainous with three-fifths of the land arid and only two-fifths fertile. Agriculture remains the primary income generating activity for most of the inhabitants, predominantly producing corn (maize), rice, plantain, manioc, yam, coffee, sugarcane and millet which are still not properly exploited (CAGH, 2019).

Figure 2-1: Location of Gressier in Haiti (Source: Nations online project)

Data Collection

In this study, I described my personal experiences through a participatory observation approach combined with interviews while in Gressier. It served as a means to explain on how the phenomena of food insecurity was researched. Each ELM developer came from different fields within agricultural departments. In my investigation, the selected population to be researched consisted of people over 18 years old, recruited as a voluntary convenience sample where demographics such as education and race were not variables. Basic information for the analysis were obtained from primary data collected during six informal semi-structured interviews with members of the Christianville Foundation Inc.to gain deeper understanding and to develop a thick, rich description of the experiences related to food insecurity in their region (Creswell, 2009., Meriam & Grenier, 2019). The people interviewed were the coordinator of the Christianville Foundation Inc., the manager of the vocational technical school, the community leader of the Fondwa village, two planters and one rabbit farmer in the region of Gressier. Information was also collected during group meetings and conversations as well, where the data were recorded.

Other data sources consisted of information through field visits, interviews, conversations, photographs, recordings and group meetings, which were recorded in terms of field notes and summarized into themes and categorized. This "interpretative naturalistic approach" perfectly suits this study, where data were collected within their natural settings. Secondary data were searched online for better understanding and clarifying certain findings. The multiple sources of data were being reviewed, organized in themes, identified for meaning and categorized for explaining the phenomena of food insecurity in the region of Gressier.

Date Analysis

The primary data were not transcribed and stayed in their original data form settings. I used a deductive constructed analysis (Marshall and Rossman, 2006) while examining the interviews,

conversations and findings from the group meetings. The main themes, significant statements and group statements were earmarked along with the meanings the participants hold about their food insecure situation. The findings were discussed with the community leaders of Christianville Foundation Inc. for validating the findings. Thus, this allowed to increase the trustworthiness of the processes.

I interpreted the data developing a textural and structural definition of what happened, how it happened, and developed the essence of the phenomenon, which is food insecurity.

<div align="center">

Findings and Discussion

</div>

The people interviewed were between 30 to 70 years of age. The application and description of the findings and events towards the research of food insecurity are presented through the four phases of Kolb's learning theory which are the concrete experiences, reflective observations, abstract conceptualization and active experimentation.

Kolb`s Phase I: Concrete Experience

This phase investigated how the phenomenon of food insecurity was researched in Gressier. I used the Kolb`s Learning cycle (Figure 1-1) for identifying needs related to food insecurity in the region of Gressier, with educational objectives to be included in development of ELMs. It started with the visits at the Christianville Foundation Inc., which was 99% Haitian staffed. I planned field trips for visiting the outreach projects and hosted activities such as food distribution at the church. We visited their diversified agricultural practices, from commercial food crops to poultry layers (Figure 2-2), goat production, and aquaculture raceways.

Figure 2-2: Layers production at Christianville Foundation Inc.
(permission granted by Christianville Foundation Inc.)

These projects were receiving technical support from North Carolina and Florida Universities. Agricultural products from these projects were supporting the daily school feeding programs at the satellite schools which enrolled some 1400 students. The goat, poultry layers, and fish project provided a weekly protein diet for the students.

The vocational school within the compound of the Christianville Foundation offered courses in agriculture, mechanics, and culinary arts with the objective to develop profit centers through each of their CVET (Center for Vocational and Technique) programs. They intended to develop student skills to encourage entrepreneurship, create employment opportunities and the capacity to provide low-cost resources for the community, develop outreach programs and generate income for supporting humanitarian activities.

The Christianville Foundation Inc. has an Elderly Nutrition Assistance Program (ENAP) which provides nutritional support to the most deprived individuals within the surrounding communities. I took part in one food distribution program which is routinely carried out on the

third week of each month. Needy community members outside the regular churchgoers are also welcomed. The monthly distribution includes rice, beans, soap and a bottle of oil to some 125 senior citizens (Christianville Foundation Inc., 2019).

The Juniper community missions (NGO) which works under the Christianville Foundation Inc. is very active in developing projects for providing adequate protein diets to children in Gressier. I visited one household that was provided support in rabbit production, where the first pair of rabbits are provided free to families. Consequently, upon several reproduction, other families would benefit from free pairs of rabbits which will be an ongoing process. The potential of each doe is the production of 25 to 50 live rabbits a year, which will yield around 125 to 250 pounds of meat (Penn State Extension, 2019).

The extent of poverty across the region was clearly visible and the reality on the ground was far from what we envisioned. We expected to see the impact of foreign assistance, which was barely visible (Del Casttilo, 2011). During field visits, I saw agricultural equipment donated by USAID found rusting in the neighboring rice paddy fields since, according to a farmer of the region, they could not be serviced and maintained due to poor financial resources. Corruptions as earmarked by the inhabitants, natural calamities, and lack of financial resources remained a non-exhaustive list to explain the phenomena of food insecurity and poverty.

> '*the region has been constantly hit by storms, earthquakes, dry spell*
>
> *and human diseases outbreak during the past decades making our*
>
> *survival extremely difficult, many friends and people died' [rejyon an te*
>
> *toujou frape pa tanpèt, tranblemanntè, sèk eple ak maladi moun*
>
> *epidemi pandan deseni ki sot pase yo fè siviv nou trè difisil, anpil zanmi*
>
> *ak moun ki te mouri.'] - Farmer*

The farmers in Gressier mentioned that the period from January to March, was no longer traditionally a rainy period. Climate change has affected the farmers` cropping patterns and the bean production, which is largely the protein diet in the locality, suffered the major losses during the recent dry spell. Moreover, the mountainous region, which depended on the '*activité pluvial'*, which means agriculture that is dependent on the rainy season, was the most affected.

> *'due to the vulnerability caused by climate change, I have to change my cropping pattern and calendar.' ['iseptibilite koze pa chanje klima, akòz kiltivatè mansyone ke ' nou te gen pou chanje nou découpage siy ak kalandriye.']. - Farmer*

Farmers substituted beans for sweet potato, which are considered to be more drought resistant. Producers diversified their crops with other staple foods such as dasheen, sweet potatoes, yam, and cassava. However, the integration of the small holder farmers in the food market remains a challenge.

The field visits revealed the extent of deforestation which was clearly visible across the region of Gressier along with the absence of sustainable conservation measures (Paskett and Philoctete, 1990). I noted heavy soil erosion, with improper furrowing design techniques, the erosion of top-soil and the poor fertility status of the soil as shown in Figure 2-3.

Figure 2-3: Deforestation and poor soil conservation measures in Fondwa village in Haiti

The region has lost most of its original forest cover, regressing the agricultural productivity on steep and eroded land (Sprenkle, 2008) making the community further food insecure. The land tenure system provided some challenges in restoring the soil fertility and forest cover. Farmers who met during the field visits mentioned that only a few of them legally owned their land. This has possibly led to discouraging long term investment in sustainable practices (Murray & Banister, 2004).

> '*the country got the worst land after the island of Hispaniola was partitioned*
> *with the Dominican Republic' ['peyi a te resevwa peyi ki pi move apre zile a*
> *nan Ispanyola te partition ak Repiblik Dominikèn'.]- Farmer*
> '*I use timber as it is a cheap source of fuel for cooking food, because gas is*
> *expensive'. ['Mwen sèvi ak bwa paske li se yon sous gaz bon mache pou kwit*
> *manje, paske gaz la chè'.] - Farmer*

I deduced that agroforestry which is considered as vital for soil conservation measures remains a constant challenge for adoption sustainable practices (Bannister & Nair, 2003).

Geisler (1995) elucidated the relationship between land concentration ownership and poverty, which in turn is interrelated to food insecurity (USAID, 2019), where land is considered a means of livelihood and economic advancement. Gressier, Haiti provided a completely different scenario. Extreme poverty has been affecting 70% of the population as mentioned by the community leaders (USAID, 2019). Surprisingly, the findings from the field visits and interviews did not find landlessness as a defining feature of food insecurity and rural poverty in Gressier (Sletten & Egset, 2004). Despite the challenges of the land tenure system described, the community leaders revealed that close to 80% of the rural households have access to land, with 70% cultivating them. This is aligned with the findings of Wiens and Sobrado (1998), who found that over 90 percent of farmers have access to land and that two-thirds own land either through purchase or inheritance with small plots. However, the egalitarian distribution, Gressier residents were able to access the land resources. Since the lands were not characterized by large ownership, there was no such wage labor issue, and thus emerged a different labor market structure. The farmers revealed that they relied on their social capital for hiring labor to work in the fields. Labor exchanges among communities and families were common and proved to be very helpful.

Following the field visits and conversations with the members of the Christianville Foundation Inc. I quickly found out that plantain is considered among the main staple food in this region of Gressier and has a major role to play in the food security status of the community. However, during my first visit to Gressier and Haiti, I observed a high infestation of a fungal disease called the black sigatoka disease (BSD) which was affecting the plantain and banana crop (Pérez-Vicente, 2012).

The field observations revealed that the BSD caused significant losses of leaf surface area, affecting the process of photosynthesis. The plantain crops barely had the minimum 5 functional

leaves for a potential yield (Figure 2-4). This was transcended into a rapid decrease in yield, premature ripening, and reduced plantain productivity (Pérez-Vicente, 2013).

Figure 2-4: Loss of functional leaves (fungal disease in Plantain), Gressier, Haiti

I deduced that in the absence of knowledge of the disease and with a lack of technical advice, the problem has remained unattended. I took the initiative to discuss the problem during a meeting which was organized by the help of a moderator with ten progressive farmers in Gressier. The plantain farmers revealed that they were unaware of the presence of this disease, which were affecting the plantain yield. I observed underdeveloped bunches of plantain of small sizes across the region.

'*I considered the displayed symptoms on the leaves as normal senescence.*

' ['*nou konsidere siye a nan fèy kòm senesence nòma'*.]- *Farmer*

Field visits and informal meetings with farmers were carried out in a few localities around Gressier to determine the means and available resources for tackling the problem. I construed that

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the disease could only be suppressed effectively under an area wide management approach with the participation of all the stakeholders. The investigation revealed several constraints for suppressing the disease. The farmers were spatially dispersed across the localities with little communication. Climate changes were also linked with the high proliferation of the disease and frequent rainfall exacerbated the spread of the fungal spores across the regions. Poor cultural management practices by the farmers did not help either. Good management practices such as the constant removal of infected leaves, burning of infected leaves away from the site of plantain cultivation, removal of weeds acting as hosts for the fungal spores, avoidance of excessive irrigation to prevent the building up of humidity, respecting the required plant density and using appropriate fungicides proved essential for effective control of the disease (Pérez-Vicente, 2012). The findings from field observations, interviews and conversation with farmers revealed that they were unaware of the disease black sigatoka.

> '*I am not aware of the presence of the disease black sigatoka' ['Mwen*
>
> *pa okouran prezans maladi sigatoka nwa a'*.]- *Farmer*

The farmers, being unaware of these practices, were not addressing the problem. Moreover, they mentioned that financial constraints are a limiting factor for adopting the proper recommendations. From my experiences working with plantain crops, I inferred that the success of the suppression of the disease needs a holistic approach with proper technical information and adequate financial support.

> '*we have very limited access to agricultural inputs such as*
>
> *fertilizer and credit facilities*.['*nou gen anpil limite aksè a entrées*
>
> *agrikiltirèl tankou angrè ak kredi fasilite'*] (which make the control
>
> more challenging)- *Representative of farmer*

During my second visit, I organized a group meeting in the region of Gressier, more precisely in Fondwa, to investigate the constraints and challenges faced by the farmers. There were 35 women who attended the workshop and shared their views, concerns, problems and potential solutions related to food security (Figure 2-5).

Figure 2-5: Group Meeting at Fondwa Village (Gressier)

'we have been living in harsh conditions, with no help from government, we

do not have access to public utilities, we feel disconnected from the

system'.['n' ap viv nan kondisyon yo di, ak okenn èd nan men gouvènman an,

nou pa gen dwa ak piblik peman pou sèvis piblik, nou santi nan sistèm nan

déconnecté'.].- Community leader

I observed and concluded that the region of Gressier lacked an extension service for the delivery of technical information and outreach programs. Several informal unstructured interviews

were also conducted with farmers of the regions and the teacher of the CVET School- the focal point from association of women to go deeper in the subject matter. This permitted the evaluation for the potential provision of technical support by Christianville foundation (NGO).

It is worth mentioning that organizing such a meeting at Fondwa village took at least one week of preparation being a remote village in the mountainous region. The people invited were from the surrounding villages who were contacted by the community leader by phone or by sending people to their dwellings. The communication network was challenging, as it took, three to four days for the message to reach them, and three more days to get organized by re-scheduling their daily responsibilities. On the scheduled meeting day, some walked as much as 4 hours from home to the meeting point. The challenges were enormous, but the people very resilient.

The region of Gressier lacked an extension service for the delivery of technical information and outreach programs. Based on interviews, group meetings, conversations, observations and field visits, I concluded that even with the limited resources available, poverty and food insecurity in the rural areas could be addressed by community development and outreach programs. Agricultural development is a precursor for stimulating economic growth (Rivera and Qamar, 2003). The people have to be empowered and provided with relevant information for adopting simple new agricultural technologies for promoting sustainable farming practices.

Using my skills and knowledge as a community-based researcher and an extension agent, I began to reflect upon the underlying complexities of this problem.

Kolb Phased 2: Reflective Observation

During my first visit, it was concluded that farmers had no idea of the presence of the fungal disease affecting the plantain and banana crops. Plantain is considered as a major staple food in the region of Gressier, while the price of rice commodity has been soaring. Plantain are grown backyard and in mini orchard settings across the region and provide a good source of

carbohydrates to the communities living on subsistence farming. The planters were not aware of the fungal disease threat, as it pertains to food security in the region.

During the second visit, the observations, meetings and interviews revealed that the farmers worked in isolation and remotely in the rural areas. There were limited extension advisory services helping the community and agriculture was still primitive with low productivity, small-scale and subsistence. They had no access to credit facilities and agricultural inputs, which hindered their progress. As concerned with farmers` education, they were not supported by government institutions, leaving the farmers on their own without any technical support. The land was poorly managed in Gressier and soil erosion were clearly visible.

These findings justified the prospect of providing technical support with existing resources available at the Christianville Foundation Inc. After these assessments were conducted periodically, it reinforced the need to produce the two ELMs dealing with the fungal disease affecting the banana and plantain crop and the potential for the provision of an extension system in Gressier that are interrelated.

The ELMs developed were intended to identify the problems, constraints and the proposal of potential solutions for combating food insecurity in the Gressier region.

Kolb Phased 3: Abstract Conceptualization

This stage of learning addressed the question of why the region of Gressier is food insecure. I analyzed the problem to be addressed, the factors contributing towards it, and how the context affected the situation.

The farmers mentioned that they have been facing major losses of their livestock production due to diseases spread after hurricanes. They have no support from reliable institutions for helping them. Planters have been shifting from bean production to root crops to adapt to the

drought conditions which have impacted their protein diet. Plantain which is considered as the main staple food was under the threat of the BSD. The plantain producers lacked knowledge and information about the disease, while climate change only worsened the situation. If the disease remains uncontrolled, the potential decrease in yield of plantain will affect the food security status in the region. The farmers did not have sufficient finance to buy agricultural inputs. Moreover, there was a dependency on food aids which were occasionally alleviating hunger in certain regions.

['*nou te santi izole.*']. The farmers felt isolated, left on their own to

solve their problems. - *Farmer*

Constant removal of the forest cover has led to catastrophic soil erosion across the region in Gressier. The field visits revealed abandoned land on steep slopes due to the loss of soil fertility due to soil erosion (Paskette & Philoctete, 1990).

The MANARD (Ministry of Agriculture of Haiti) has not been able to organize an effective extension service for the farming community. There is a lack of coordination among all stakeholders such as NGOs, the private sector, farmers, universities, and agro-enterprise business stores. This resulted in low agricultural yields and an underdeveloped subsistence agricultural sector. These conditions have further made them food insecure.

The causes of food insecurity are summarized as follows: deforestation, eroded land, fungal disease affecting plantain, poor agricultural productivity, poor adult education, climate change, frequent natural disasters and isolation of localities.

Kolb Phased 4: Active Experimentation

The last step, active experimentation, was to identify potential solutions for combating food insecurity in the region of Gressier, with all the various factors involved. Raising and stabilizing

agricultural productivity was found to be a precursor for achieving food security status. I earmarked two major problems that needed to be addressed: (1) the potential threat of the BSD which is hampering the plantain production and the lack of source of protein in the diet of the community, (2) ELMs developed by the authors discussed problems related to animal husbandry, aquaculture, food crops productions, vocational education, and sustainable practices such as composting, water management, and post-harvest losses, which are all related to extension outreach programs.

It was construed that the Christianville Foundation (NGO) has the potential to play an important role in empowering the farming community in Gressier. The CVET has trained young cadets who can potentially act as extension agents and there was a need to provide the community with technical advice on sustainable practices for increasing the agricultural productivity.

An extension system was devised, proposed, and accepted by the CVET to address the needs of the farmers. The proposed project of an extension service would be on a pilot phase (see Appendix 1, Logic Model). The extension agents, being locals, would have a better understanding of the local constraints and challenges of the farming community. This also would help the farmers build their social capital while improving the communication network. However, trained cadets must be provided with means to cover transportation costs as well as a salary.

The recommendations for controlling the disease BSD were included in the plantain ELM with the prospect of an area-wide management approach. It encompassed the mandatory sanitary conditions as well as the chemical control of the fungal disease. Again, it would be the role of the extension agents to deliver technical advice to the plantain farmers in Gressier. The two ELMs developed complement each other.

The potential of providing a source of protein was through rabbit rearing. Rabbit has the ability to reproduce rapidly over a short period of time. This project has been ongoing, in small-scale, in certain regions of Gressier and undertaken by the Juniper community (NGO) working with Christianville Foundation Inc. The potential of expanding the project was addressed and the villagers in Gressier found it as a potential source of protein.

Food Insecurity- What Does It Mean for the Gressier Community?

Powerful narratives were shared by the local community to what food insecurity meant to them? They stressed upon the poverty and distress of the families living in the surrounding area of Fondwa village. One member of the Christianville Foundation Inc. mentioned that there was no guarantee for a daily meal for their children ['*okenn garanti pou yon manje chak jou pou moun.*'].

The food insecurity situation very often resulted in hunger and malnutrition, which are clearly visible across the villages. This means a lot to the Gressier community, where the most affected population are the children. It has impaired the active and healthy life of the community. The children at a neighboring school displayed symptom of anemia, brittle bones and stunted growth. The kids attending the satellite schools under the auspice of Christianville Foundation Inc. were receiving a meal at the school premises. The teachers mentioned they have to make sure the kids were eating their meal on the school premises. This was because the children have the habit of hiding food in their pockets and underwear to bring back home for their siblings and parents. The teachers said this has a drastic effect where the food was getting spoiled and was infecting the people consuming it. The parents of the Fondwa village have hope that they can provide three meals a day to their children, though this is still not a reality. Food insecurity, hunger and malnutrition have resulted in many deaths, with children being the most affected.

'I wish to leave a legacy for my children, where they could at least

meet their daily nutritional requirements'. ['Mwen ta renmen kite yon

eritaj pou pitit mwen yo, kote yo te kapab omwen satisfè egzijans

nitrisyonèl chak jou yo']. - Villager

Despite the noble efforts of the Christianville Foundation Inc. of providing a daily meal to the children, it was still insufficient for feeding the whole surrounding community.

One member of the Christianville Foundation Inc. mentioned that fluctuation of food availability was impacting the nutritional status of the villagers. He added that there was a rise of chronic and infectious diseases, hampering rural development. He added that the people were left on their own, disconnected and with no support.

Conclusion

I used the framework of the Kolb's cycle (Kolb. 1984) for the community-based research, investigating the phenomenon of food insecurity in the region of Gressier in Haiti. The inductive and deductive approach, through the four components of learning, fully captured the peculiarity of food insecurity. The concrete experiences through the field visits, observations, group meetings and conversations were highly revealing and overwhelming as it showed people living in absolute poverty with very little support. The development of the ELMs was based on my subjectivity, which was validated and triangulated with the Christianville Foundation Inc. community leaders. The other developers of ELMs and I chose to develop topics which were related to our field of study which were the most relevant to the local conditions in Gressier .

The framework of Kolb's experiential learning theory proved to be effective in this study and allowed for an immersive experience along with deep reflexivity and critical thinking. Through a social constructivist approach, the problems pertaining to food insecurity was

investigated within the community in Gressier, which allowed a certain level of participation in the study. The final version of the ELMs was vetted and validated by the professors and published in the Texas A&M website.

Food insecurity still remains a long-standing challenge in the region of Gressier. The communities have been affected by natural calamities like storms, prolonged drought, and torrential rainfall in certain regions over the past decades, which has exacerbated the situation. The food insecure conditions resulted into hunger and malnutrition, which were visible across the villages visited, but showed resilience.

The two ELMs I developed, 'the fungal disease affecting plantain and the potential of providing an extension service for Gressier, revealed the problem of food availability and stability within the region, causing food insecurity which in turn resulted in hunger and malnutrition in Gressier.

Food insecurity and poverty in the rural areas of Gressier was explained by the geographical features of the regions (Bradshaw, 2006). The field observations and interviews revealed the rural areas with low income were characterized by poor agro-climatic conditions, soil erosion, poor agricultural productivity, lack of infrastructure, no jobs prospects, no credit facilities, lack of accessibility to public utilities, and services such as education, roads, housing, clean water, health facilities and electricity (Sletten & Egset, 2004). The region also had very poor extension service and outreach programs (Arias & Sy, 2013; Christoplos, 2010) showing a lack of institutional support. However, raising agricultural productivity will bring surplus cash which could be invested in education, innovative farming technologies, and better housing conditions with basic utilities to serve as buffer in harsh conditions.

The geographic isolation of villages renders the task of making communities food secure challenging and also negatively contributes towards food insecurity. There has been a prolonged drought spell in specific areas which has seriously affected agricultural productivity and made it difficult to tap water resources from nearby rivers which could potentially provide irrigation facilities. Torrential rainfall in mountainous areas as well have eroded the topsoil status of the region. The remoteness of the villagers has isolated them from the mainstream of rural development, with little support from NGOs and international institutions.

The aspect of low agricultural productivity is also related to the poor nutritional status of the community, which hinders rural development and reverts back to the poverty cycle (Bradshaw, 2006). Food aids initiatives from the Christianville Foundations Inc have, however, partly solved the problem, although limited in their capacity to provide food aid and not prevalent over all the villages.

The poor political and economic structure caused prolonged systemic barriers. There were lack of availability of agricultural inputs which were mostly procured from the Dominican Republic. This clearly showed political and economic distortions, where the government were unable to provide the basic utilities to the community of Gressier. The Christianville Foundation Inc. has, however, partially fulfilled the role of the government by providing outreach programs through their medical clinic, providing food to elderly people and free schooling for children, educating young cadets in agriculture and mechanics, setting up a laboratory for screening and detecting human diseases, and providing a marketplace for artisanal product sales.

Despite the conditions of absolute poverty in the region of Gressier, the people were resilient and subsistence farming practices were prevalent across the region. The instance of the potential threat of the fungal disease in plantain, considered as the main staple food, and the lack

of education of the farmers due to inexistent extension support created a more complex situation worsening the food insecure conditions. The lack of sustainable practices was obvious where the land was being managed without proper soil conservation measures.

This situation has created a spiral cycle of poverty in these regions (Bradshaw, 2006). This social dysfunction was also inherent, as there was a high dependency on foreign aid and international agencies. This was exacerbated by consecutive widespread human diseases that struck the localities during the last few decades, making the recovery very slow in the region of Gressier, as well as around the country (Del Castillo, 2011). Rural development remains a precursor for breaking the spiral cycle of poverty which is interrelated to food insecurity and is multidimensional.

The following proposals are made for alleviating poverty and food insecurity in Gressier.

Empowerment of Non-Governmental Organizations

It is proposed that NGOs such as the Christianville Foundation Inc. and similar NGOs which are being successful in providing these basic needs should be further empowered financially and logistically to provide the same services on a larger scale. This NGO has been innovative in providing outreach programs where international institutions failed.

The international institutions such as USAID and FAO should gear their efforts towards providing the appropriate logistic, financial support and knowledge to successful NGOs that have already built a social capital with its community and understand the needs and requirements of the people. Successful local institutions should be screened, earmarked and supported as they prove to be successful, because much more needs to be achieved to solve food insecurity problems.

Provision of Extension Services and Outreach Programs

Since the farmers in Gressier are relatively poor and deprived from access to innovative agricultural technologies with little or no communication with government agricultural officers, there is a potential payoff in investing in a public/NGO or private/NGO sector extension. The gap between current and potential agricultural productivity is large and extension work can contribute towards reducing the gap. This justifies the early investment in an extension system where the marginal return would be very high. An extension service would bridge the communication gap among the villages in Gressier, which would potentially benefit from outreach programs for alleviating poverty and food insecure conditions. The CVET (agricultural school) which is under the Christianville foundation has all the logistic and technical facilities to provide such services. Agricultural development would help to revive other sectors of the economy (Rivera & Qamar, 2003).

The ELMs I developed, provide solutions for key basic needs like food while considering and aligning with short-term intervention strategies as a steppingstone to move towards a long-term impact. Developing and adopting sustainable agricultural practices is a necessity for rural development where the small farm holders need to be integrated into the marketing supply chain.

Unfortunately, the vulnerability of Haiti to disasters like storms, earthquakes and disease outbreaks make the process of rehabilitation challenging (Fordyce, Sadiq & Chikoto, 2012). However, the Christianville Foundation Inc. has showed its resilience and capacity in implementing sustainable programs that provide hope for present and future generations. Agricultural extension can help to revive rural development, which in turn would combat food insecurity and poverty in the Gressier region.

This research on the phenomena of food insecurity is limited to the region of Gressier, Haiti where the research was conducted. Nonetheless, the findings of this study can be generalized across the rural regions of Haiti only, since they share similar socio-economic, political and environmental conditions. This study serves as a template to help researchers search the causes of food insecurity in other challenging places in the world. However, the findings cannot be generalized in a globalized context, as strategies for alleviating poverty and food security might differ, even if other countries share the same geographical location or same social indicators (Rivera and Qamar, 2003).

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Chapter 3: Experiential Learning Modules for Teaching International Agricultural Development: How to Use these Tools and Assess their Impact

Abstract

Experiential learning is about constructing knowledge and meaning from real life experience which permit the progress of new theories through new understandings. Kolb (1984) defined learning as the process whereby knowledge was created through the transformation of experience. Experiential Learning Modules (ELMs) are instructional materials with educational objectives based on identified needs related to food insecurity and human sufferings. They were developed in Haiti during an international service learning (ISL). ELMs combined pictures, videos and voice-over presentation to create a contextually rich vicarious learning experience for the classroom learner. ELMs were built to be incorporated in graduate program curricula with the main objective to prepare global agriculturalists to solve complex problems linked with food insecurity in developing countries. There are no standardized rules on how to use ELMs in a classroom setting. The purpose of the paper is to explain what experiential learning modules are, how to apply them in a classroom setting and its impact on the students. We introduced the study of the ELM on plantain production in Haiti as a case example, which was implemented in Rural Sociology courses that included mainly graduate students from agricultural development courses, political economy, rural sociology and pre-med students at Auburn University. There was a pre-reflection and a post-reflection exercise, in between the study of the ELMs, followed by class discussions and a final learning assessment. The findings showed that initially more than 95% of the students were unacquainted with the country Haiti or plantain production. The thematic analysis revealed that the students were engaged in a high level of additional research, quality reflection and understanding which encompassed a broad field of socio-economic, cultural, political, educational and environmental topics for explaining food insecurity and human suffering in Haiti. It was found

that the instructional delivery proposed had been effective in reaching the educational objectives set. The results from initial classroom use of the plantain ELM and the reactions of students were considered a guide and offered revisions and realignment of the tool. This paper makes proposals on improving the current tools and studies that need further research. ELMs could be used as the foundation for new courses, incorporated into on-going courses, be a model for developing other ELMs, and be presented individually at seminars and workshops addressing issues on international development.

Keywords: experiential learning modules, vicarious experience, pre-post reflection exercise, learning assessment, thematic analysis, global agriculturalists and international development.

Experiential Learning Modules for Teaching International Agricultural Development: How to Use these Tools and Assess their Impact

Introduction

Experiential learning is about constructing knowledge and meaning from real life experience leading to new understanding and perspective. Dewey's (1938) 'learning by doing' theory emphasized the value of action while learning. Kolb (1984) defined learning as the process whereby knowledge was created through the transformation of experience. Lai et al. (2007) maintained that "optimal learning occurred when people could link past experience with new concepts they wanted to learn" (p. 326).

The development of experiential learning modules (ELMs) was based on Kolb`s learning model and experiential learning theory characterized by a four-stage learning cycle; concrete experience, reflective observation, abstract conceptualization and active experimentation (Figure 1-1). It allows the development of effective learning where concrete experiences permit new observation and reflections on the experience (Omer et al., 2017; Baker & Robinson, 2016).

An ELM is a combination of pictures, videos and voice-over presentation that aim at converting the concrete experiences into lively relayed knowledge for the classroom learner. The ELMs developed are to be shared with other students and faculties involved in international agricultural education. An ELM for international agriculture was intended to augment the learner's conception and understanding of the problems of development.

An ELM has the objective to prepare global agriculturalists to solve complex problems linked with food insecurity and human sufferings in an underdeveloped country like Haiti. A total of 24 ELMs has been developed and published on the Texas A&M website (Briers, 2017). The ELMs encompassed a broad range of topics such as: horticulture, livestock production, water resources management, agricultural development and extension, and agricultural education.

The ELM intends to replace 'hands-on' experiences with a virtual educational tool drawn from experiences in Haiti. An ELM was also developed with the objective to provide a vicarious experience within a classroom setting for students willing to pursue a career in international development. Thus, it has become highly important to improve the quality of instruction and produce students who can contribute toward solving complex problems related to global food insecurity and human sufferings. However, devising such a curriculum remains a challenge which constantly need to be updated, restructured and improved based upon previous experiences.

The purpose of this paper is to explain what ELMs are and how to implement them into an international agricultural development course within a classroom setting and as well as their assessment. An experiential learning activity design is proposed for the optimal point to use an ELM. The ELM on plantain production in Haiti is introduced as a case example for developing an instructional model and its assessment. This paper will also contribute toward identifying the strength and limitations of ELMs as a teaching tool, providing suggestions for improving the teaching module and further research required.

Ultimately, if ELMs are to be widely used and have impact, instructors need to understand what ELMs can do for students, what foundation is needed by the instructor, what the instructor needs to do to prepare to motivate the students, how to make sense of the outcome, and how to measure impacts. For better impacts some basic experiences and/or knowledge among the students would largely benefit the learning processes.

The results from initial classroom use of the ELM and the reactions of students will be considered as a guide for revision and realignment of the tool. This will help in improving the delivery of the educational materials and enhancing the learning experience of the students. This

will contribute in improving recruitment and preparing students from diverse backgrounds to solve interconnected, prevailing and future food insecurity problems in a global context.

Experiential Learning Modules (ELM)

What is an ELM?

An ELM is a simulation model or replica of a real-world situation simplified to augment understanding of complex problems from the perspective of the participants. Chaurasia (2017) found that "simulations permitted learners to solve real-world problems, and they offered an opportunity to test recently attained skills without risk". Simulations could permit "learners to visualize, discover, and articulate explanations for phenomena that would otherwise be difficult to observe" (p.1).

Simulations can be computational models of actual or theorized conditions or natural phenomena that permit users to discover the consequences of employing or adapting to constraints within them. ELMs are a form of simulation that does not involve computation or augmented reality. ELMs use PowerPoint with sound, pictures, and content designed to substitute for personal experience. ELMs can take students into the life-worlds of farmers and family members in developing-country households, augmenting comprehension of dilemmas, constraints, and possibilities facing participants (Briers, 2017). They are instructional materials with educational objectives based on identified needs related to food insecurity and human suffering, which in turn conveys the contextual information of the need identified by the target audience.

The study of ELMs can be individual-based or group-based. Instructors may elect that students individually complete an ELM following introductory lecture material. Group efforts to follow the ELM, develop a consensus response, and then articulate and defend the strategy to the larger class. Each approach offers alternatives to traditional class-based teaching which often

follows "a pedagogical model where learners are receivers of content and directions given by a teacher or a trainer" (Chaurasia, 2017). ELMs present a series of "tasks, problems, or life situations" in which a learner needs to respond (Knowles, 1990). ELMs are partially a form of self-directed adult learning enabling participants to be self-directed, to be involved in the learning process, to learn best when they have a need to know, to connect new learning with past experiences, and to apply their learning to the real world (Blaylock et al., 2008).

The main objective of ELMs is to prepare global agriculturalists to solve complex problems linked with food insecurity in developing countries. It has the aim of preparing graduate students to connect theory to practice, to be innovative and take risks, to decide on situation of uncertainties, to have the capacity to solve complex problems, to collaborate across differences improving their communication skills, to think critically and reflect on learning (Dartmouth Centre, 2017). In general, it was found that experiential learnings have improved the aptitude and cognitive abilities of the students (Eggers et al., 2017). The ELMs were intended to bring that vicarious learning within a classroom setting to improve the learner's knowledge on food insecurity in Haiti.

An Example: Plantain Production in Haiti

Plantain is a starchy, low-sugar cooking banana, one of several banana cultivars in the genus Musa whose fruits are generally unsuitable for raw consumption. The plantain ELM example considered here was developed in a context of a service learning through an ISL in Haiti. The immersive experiences at that point allowed the building up of an ELM linking plantain to food security issues in the Gressier region of Haiti. There was a fungal disease called black sigatoka which was affecting and severely hampering the plantain productivity. This ELM served

as teaching the students about the threat of food insecurity if this fungal problem affecting plantain is not properly addressed.

As a francophone graduate student based on an understanding of the educational objectives of the ELM, along with my personal experience as an extension officer and acquaintance with the technical literature on plantain production, I developed the ELM entitled 'sustainable management practices of plantain in Haiti with emphasis on the control of the disease black sigatoka.' This ELM would help students to better understand the needs of the community researched and empower them for a career in international agricultural development.

Experiential Learning Activity Design and Implementation

Learning flow

In this study, we developed an ELM learning flow to support instruction about international agricultural development based on experiential learning procedures in stages. However, it is important to understand the steps taken towards the building up of the ELMs that are described below for better comprehending what the developers of ELMs have been through and what it means for the students studying them in turn.

Concrete experience

Following an immersive experience into a political, social and cultural environment, the developers of the ELMs felt and developed the requirements and needs of the community, related to food security. This activity could be carried out by making contact to people through group meetings, individual interviews, field visits etc. This stage was combined with extensive literature search.

To capture the features of various agricultural enterprises concretely and efficiently, and to collect data for their retention, the developers of ELMs used mobile phones and cameras to take photographs. The cameras could record the visual information quickly and gather information to

capture authentic and complex phenomena. These photographs aided students in recalling information acquired in the learning environment and also were featured in the ELMs.

Reflective observation and group discussion

During this stage, students shared information and perspective as they developed their ELMs in a group setting. Feedback from colleagues and discussion within the group helped in refining and clarifying the first drafts of the ELMs. It was a stage to describe the observations, reactions and feelings of the experience.

Abstract conceptualization and comparison

This stage was for analyzing the problems and defining the factors causing them, while considering how the context has affected the situation. Students shared their ELMS to observe and reflect more deeply than in the previous stage, and again revise and refocus their modules based on these observations. If students needed background information, they could access online learning material. They were also encouraged to compare the situation they defined to a comparable situation they have experienced or encountered in the past. The aim of the comparison and question proposing stages were to make students reflect and restructure their cognitive schemas to reach a refined and deep conceptual understanding.

In my context while working with the ELM on banana/plantain, I compared the problem to my country of residence, Mauritius, where we have a similar climate to Haiti and faced a similar disease outbreak. The goals of this stage were to help students organize the knowledge formed in the whole field-trip learning activity and encourage us to conceptualize.

Active experimentation

This stage guided students in developing solutions based on their reflective observation and from what they deduced or theorized (abstract conceptualization). The challenge was to provide

solutions which are adapted to the local conditions and suiting the cultural and social environment. The level of experience of the students in their respective discipline was sought after for providing workable solutions. The challenging conditions in Haiti rendered the problems related to food security and human suffering more complex.

Final report – ELM developed

After going through the Kolb`s cycle learning style in the building up of ELMs, students were encouraged to review their findings, field observations and what they theorized, and provide solutions. In the light of additional information, we again indulged into a new experience followed by new reflection, which was a constant learning process. After reaching final conclusions we built up the final report in the form of a power point presentation. During this process, we could refer to our photographs, recorded vocal questions and observation notes. The major goal was knowledge creation through experiential learning.

The following sections identify ELMs as a teaching and learning tool, addressing implementation processes and assessment issues. Ultimately, if ELMs are to be widely used and have impact, instructors need to understand what they are getting into, what they need to do to prepare themselves, what they need to do to prepare and motivate the students, how to make sense of the outcome, and how to measure changes.

What is the Target Audience for ELMs?

A target audience such as agricultural students having some background and context in an agricultural production is the intended set of learners using an ELM. An ELM is intended to be used by pure social science majors, political economy, rural sociology or liberal arts students who might require additional technical explanation and support. ELMs were developed and implemented in the context of a specific course and learning objective.

Implementing an ELM as a Course Feature

One approach to using an ELM is in the context of a course that contains a segment on international agricultural development, agricultural extension and research and community development. Lectures may provide a broader perspective on demographic trends in developing countries, threats for food security, and the socio-economic, educational status and processes of technical change in agriculture. The ELM might help students better understand farm level problems in farming and food production. Specifically, the plantain module would elucidate the value chain for plantain / banana production in Haiti, threats to production emanating from pests and plant diseases, climate change and coping strategies implemented in the Haitian context.

An instructional model or plan of how to demonstrate or teach students about ELM is being proposed under a systematic approach (See Appendix 1). The objective is to bring a contextually rich vicarious learning experience to the classroom learner. The plan of action consists mainly of a pre-reflection stage followed by the viewing of the ELM, the post-reflection stage and class discussions in between. A learning assessment is being developed for the learners to evaluate their level of understanding about how much they have learned at the end of the course. The pre-reflection and post-reflection stages and the learning assessment are accessed through a shared site. The ELMs allow understanding and reflections of sensitive issues which stimulate the classroom learners to contribute toward addressing the problems.

Optimal Point for Students to Use an ELM

Being the ELM developer and having discussed with the faculty member involved in the building up of the ELM, I suggested that the timing of ELMs as a teaching tool can vary on the contents of the course (undergraduates or grade curricula), the objectives of the instructor, and the capabilities of the students (Wurdinger & Carlson, 2010). ELMs are probably not an opening event

in a course, but conceivably they could be. ELMs may be argued to have the most impact on student learning when implemented as a capstone activity culminating presentation, reading, and lecture on international agricultural development. The ELM might be one way to consolidate and crystallize learning on a topic, stimulating student appetites for further learning and experience on the topic.

The timing of the ELM also reflects the number of ELMs to be used in the course. Multiple ELMs in a course focused on international agricultural development would intersperse ELMs among related course segments. Other courses that may only have a segment on international agriculture or food problems might employ an ELM as a consolidating learning activity as described above.

Reflexivity in the Study of Experiential Learning Modules

Hatcher and Bringle (1997) defined reflection as "intentional consideration of an experience in light of particular learning objectives" which led to personal growth (p, 153). They stated that not all experiences always led to learning which often creates controversy, if not reflected upon. Experiences not reflected upon, open possibilities to be biased, have presuppositions and stereotyping ending up in inaction (Dewey, 1933; Sheckley, Allen & Keeton, 1993). Following an experience, key perceptions are developed and if well thought upon, generalization can be made which can have a bearing on future actions (Kolb`s, 1984; Glenn & Nelson, 1988).

Reflexivity is an important component in the study of ELMs where the educational content of the ELMs should be linked to the learning objectives. Structured class discussions should be envisaged to fit the learning experience into the course. This will allow the students to make a better connection of course work to real life situations, enhancing the learning process. Reflection

is a crucial step where the students or learners of the ELMs must take well into account to reinforce critical thinking in international development, community development and civic engagement. These processes nevertheless should be properly guided, where feedback and assessment are considered as crucial for improving the learning experience.

The critical moments of reflectivity, however, happens along with the study of the ELMs while the students are learning, critically thinking, exploring additional resources from the literature and making their own conclusions. Class discussions as suggested are considered vital where interactions among the students would allow in depth understandings, perspectives and a broader view on the subject matter.

Method

Tools to Assess ELM Impacts

Burns et al. (1990) decried the lack of rigorous research in evaluating the learning effectiveness of experiential methods. The focus of their concerns centers on the issue of "validity: internal validity or changes in students 'learning in the classroom settings, external validity or the generalizability of any learning effects to outside classroom situations, and transfer-internalization validity or the ultimate impact of the simulation experience on the student's career" (Eriksson et al., 1997; Gosen & Washburn, 2004; Feinstein & Cannon, 2014). Ideally, ELM assessments should follow an experimental design with pre-tests and random assignments for treatment conditions (Campbell, 1963).

Paper-and-pencil assessment forms that contain qualitative and quantitative ratings of the ELM experience are prototypical assessment tools. Some approaches use theoretical dimensions of learning and impact to justify and define the assessment tool content. Such assessments also are mechanisms to adjust the content and presentation of an ELM, adjusting aspects that were not

balanced, or that students found tiresome or overly technical for their level of understanding. Online versions of these assessments offer convenient ways to accumulate data in a standardized way, to accommodate students who were not present during assessment, or to avoid using class time for assessment. Comments and questions about the ELMs can be more readily accumulated and address in a web-based format. The pre-reflection and post-reflection will help the students in analyzing their facts, bias or subjectivity, and assess how much knowledge they acquired after the study of the ELMs. The learning assessment also will show the reflective aspects of the exercise. After the completion of the ELMs, the learners are encouraged to take a survey for evaluating the experiential learning modules with the perceptions of their personal impact and change which is provided through a link. IRB consent was not required for this study.

Instructions

Appendix 1 described the flow of instructions for the study of ELMs through a shared point online, which was readily accessed to the enrolled students at the Auburn University, through a learning management system referred as 'canvas'. The ELM on plantain was taken as a case study to develop instructions delivery. The ELM is about plantain, considered as a staple food, and the threat of a fungal disease called black sigatoka affecting the plantain production in Gressier, with the risk of negatively impacting food security over the region.

The exercises consisted of a pre reflection survey, the study of the ELM, two class discussions, a post reflective survey and a general learning assessment. The exercises were interspaced by 2 weeks in between each task, allowing the students ample time to carry out additional search, and to internalize and reflect on what has been taught and learned. The Rural Sociology class consisted of 48 students with the two classes combined. The completion of the exercises was a requirement for the Rural Sociology courses at the Auburn University, making the

participation of the students' compulsory. Therefore, the whole class participated in the survey as it was part of the course requirements.

Pre-Reflective Survey

It consisted of a pre-reflection survey which intended to capture the student's general knowledge about the country (Haiti), the importance of plantain as staple food for the Haitians, and the expectations the students have from this learning. This exercise allowed the instructors to become aware of the student's general knowledge and expectations, and to have the possibility of re-orienting their teaching strategies to include other salient features, as earmarked.

The students were directed to the Texas A&M University website where the ELMs are published. The students were also encouraged to read the about the project, understand what an ELM is, and to take cognizance of the different ELMs published.

Class Discussion

Two class discussions followed, with the description of the experiences we had during the ISL. General knowledge was shared about Haiti, the region of Gressier where the ELMs were developed, the contribution of the host NGO (Christianville Foundation Inc.), the encounters, the challenges we faced, the outreach program and satellite schools we visited, the distribution of food at the church and other salient observations.

The second-class discussions were about the ELM plantain and its relative importance for the food security for the region of Gressier where the ELM was developed.

Both class discussions aimed at informing, sharing and discussing the problems of food insecurity. The interactions allowed the students to share their views, discuss pre-conceptions, and come along with their additional searches made.

Post Reflection Survey

The post reflection survey was meant to evaluate the changes in knowledge acquired, new understandings, change in perceptions and the new mind-sets established. Moreover, the class discussion allowed the students to ponder how they would position themselves in face of these problems. It also viewed the issue of food insecurity over an international context on how food insecure countries like Haiti can affect the U.S.

Learning Assessment

This last exercise evaluated the understanding and knowledge acquired by the students on the plantain problem, the potential solutions and the challenges for remedial actions, the effect of climate change on the disease and how the role of extension is empowering the farmers for allowing transformational education. The learning assessment was an appraisal of the learning objectives. It allowed an evaluation on how much they learned about the causes of food insecurity intertwined with poverty and the ways and means BSD could be suppressed.

Thematic analysis was carried out for the pre/post reflection surveys and the learning assessments. This allowed identification of themes and patterns for explaining and assessing the student's knowledge on the different aspects of food insecurity, on what they knew initially, what they learned and gained as knowledge, and the different facets of food insecurity which is multidimensional (Braun et al., 2006).

<center>**Findings**</center>

Pre-Reflection Survey Results

Table 3.0 presents selected narratives of the pre-reflection surveys. Students were asked four general questions to appraise their perception and comprehension of the case-study on

plantain within their own subjectivity. 35 students responded to know very little, 12 some knowledge and only one knowing a lot about Haiti.

The students stated that they knew little about the country in general, but showed to be aware on the prevailing level of poverty and food insecurity conditions in Haiti. They related these constraints to overpopulation, the inability to maximize the use of resources, poor health and sanitary measures, and environmental problems associated with unsustainable practices such as deforestation and mismanagement of arable land. They mentioned the country's vulnerability to natural disasters and that calamities over the past decades has made their recovery slow. The political instability, poor government policies and corruption were considered as an antecedent for the absolute poverty in Haiti. The lack of educational facilities was also earmarked as potentially causing a food insecure situation.

The students were however aware of the importance of the plantain as a staple food for the Haitian community, but little was known by the majority of the students (88%) about the BSD affecting the plantain production, considered as a major threat to food security.

The expectations from the study of the ELMs were found to be relevant. The students wanted to get more insight on Haitian agriculture, structural problems affecting food security status of the country, potential solutions for alleviating them, agronomic practices and technical recommendations for controlling the disease, marketing aspects, impact of food insecurity on the country`s economy and trade, and the ways plantain are consumed in Haiti.

Table 3.0 Thematic Analysis of Narratives and Responses of Students from Pre-Reflection Survey

	Themes	Narratives/ Responses
What are some challenges and problems the country is facing?	Poverty and food insecurity	People are poor, severe poverty, food shortage/scarcity and lack of accessibility to food, starvation, hunger, low wages, debt
	Infrastructure, healthcare and sanitation	Lack infrastructure, lack of access to medical care, poor sanitary measures, and lack of clean water, low life expectancy
	Unsustainable practices	Deforestation, resource depletion, lack of arable land
	Overpopulation	Overpopulation, population is booming
	Non resource efficient	Land-use isn't being maximized to fully exploit agricultural production
	Environmental problems	Dumping site for textile waste (from other countries), lack of environmental regulations
	Social injustice	Huge wealth disparity in the country, with a select few families running all the major industries
	Natural calamities	Natural disasters and calamities, economic and infrastructure damage remaining after earthquake, flooding, tsunamis, slow recovery from natural calamities, still recovering from a massive earthquake
	Government policies and corruptions	Political instability, inflation, job shortages, corrupted government, political environment does not foster a stable country.
	Poor education	Adult literacy rates being low, illiteracy, lack of access to quality education, many living in Haiti do not have access to education

(cont..)	Themes	Narratives/Responses
How is plantain and banana production important for Haiti?	Food security	Staple food, vital for food security, vital for food and economy, I know nothing about plantain and banana production in Haiti, but I would imagine that it is very important
	Economy- local and national	Main source of income. financial livelihoods, exportation allows them to establish a stable industry and source of revenue
Have you heard of plant disease black sigatoka?	Large majority unaware	Yes (4), No (42) and May be (2)
What do you expect to find out from the ELM on Plantain in Haiti?	General knowledge	Haitian agriculture, why bananas and plantains are so important to Haiti, the effect that banana and plantain production has on Haiti's economy, I expect to learn more about plantain production and its impact on the economy of Haiti
	Food security issues and agriculture	Impact of BSD on food security and daily lives, hunger alleviation strategies, how government affects food shortages, I expect to learn about black sigatoka and its effects on Haitian agriculture, how the plant disease black sigatoka affects bananas and plantains and what that means for the island's economy
	Structural problems	Socio-economic and political factors affecting productions and the economy. I am not sure, but hopefully about the economy, politics, and how they are recovering from natural disasters, rehabilitation efforts.
	Agronomic practice and technical recommendations	A little bit about disease control, agronomic practices, how farmers grow bananas and plantains, and some problems and solutions on how they are grown

(Cont..)	Themes	Narratives/Responses
	Economy and trade	Importance of plantain to economy, impact of BSD on economy, trade, profitability, export More about banana and plantain production and its role in Haiti's exports and how it contributes to the economy and improving the lives of Haiti people. I expect to learn more about production, its impact on the economy of Haiti, and rehabilitation efforts.
	Supply chain and marketing	The marketing channel and its problems. I hope to learn about the system the plantation owners use to sell and distribute the bananas. Who produces them and where do they go? I would also like to learn about the condition's employees work under.
	Cultural relativism	Ways plantain are consumed

Post Reflection Surveys

Table 3.1 presents the selected narratives of the post-reflection surveys. The students have been able to learn more about the country, which is mainly agriculturally based, the level of poverty, the importance of plantain as the main staple food, the effects of climate change influencing the BSD outbreak, the lack of scientific study and outreach programs, poor extension network and communication channels, poor financial resources and the isolation of farmers, which are all interrelated and impacting food security.

The students felt strongly about having a responsible global mind-set and the necessity of educating farmers. They reinforced the linkage between food security, subsistence farming and plantain. They found the need for an extension service to disseminate technical information along with the challenge of the isolated farmers and a lack of communication. U.S. foreign aid (financial) was found to be a solution for the Haitian financial problems which was also considered to have an economic impact on U.S. The high level of poverty was related to trade deficits being a net importing country and the dependency on food aid for survival. The unfair trade policies between U.S and Haiti was given as a cause of the level of poverty which were affecting the local farmers. The students felt that self-development and awareness are essential to be able to understand and contribute towards achieving food security and alleviating poverty. The students addressed the likelihoods and migration of Haitians to U.S. which has socio-economic impacts on both countries.

Table 3.1 Thematic Analysis of Narratives and Responses of Students from Post-Reflection Survey

	Themes	Narratives/ Responses
What are the main points you learned about Haiti from the ELM?	Poverty, isolation and remoteness, poor communication	Poverty level very high, sounds like most of Haiti is rural and the farmers are really isolated, farmers are spatially spread out, inability to communicate about the disease, learned about the difficulties faced in educating farmers that live in isolated areas. The extent of Haiti's lack of communication in remote areas was eye opening
	Agriculturally dependent	Agriculturally based, tropical climate, plantain main source of staple food for the Haitian people, vital as both a source of nourishment and revenue, learned about the dependence on the plantain crop
	Food security and climate change	Impact of BSD on plantain, learned about the effect climate change is already having on crops, the threat of the BSD as an air borne disease that affects the plants
	Poor agricultural service and research	Weak agricultural extension, low level of education for farmers, lack of information and adequate resources, scientific study, and technology has left Haitian plantain farmers with little to bring to the fight against black sigatoka.
	Import dependency	Depend heavily on food importations

(cont..)	Themes	Narratives/Responses
How did the ELMs affect your thoughts and feelings about Haiti?	Farmers education	The need to educate the farmers about the different diseases that could affect the livelihood of the people that is killing off their staple crops, need for education and extension programs for farmers
	Extension service network, education of farmers and collaborative work	Dissemination of information vital, lack of educational resources and demonstrations, collaboration among farmers needed, farmers education would increase farmers productivity
	Poor communication network	Lack of communication of needed ideas can surely affect an area, especially Haiti that deals with a shortage of food.
	Self-development, global and responsible mind-set, community building	Developing more on my background about the country, want to help, awareness on food insecurity issues, seen unfamiliar parts of Haiti, glad to see efforts by technicians in Haiti for solving the problem
	Financial livelihoods	Source of income, plantain production is vital to Haiti for economic and sustainability reasons
	Isolation of farmers	Farmers dispersed regionally, challenges for collaborative actions, isolation of farmers and lack of educational resources are putting this country at dire risk, challenges for collaborative action
	Plantain and food security	Plantain integrated in national welfare as a main staple food, vital for livelihoods, linked to food security, part of Haitian culture, source of income wasn't aware that plantain plants were a major source of food for the people of Haiti, BSD cause major problems if it persists, leading to food insecurity.
	Dependency on foreign aids	Require international assistance for solving the problem of BSD, lack of resources, International aid intervention vital

(cont.…)	Themes	Narratives/Responses
How do you think the situation in Haiti affects what happens in the U.S?	Immigration problems	Many people of Haiti are fleeing their country in order to improve their lives and provide better opportunities for their families. As a result, many Haitians are immigrating to the US, which could pose both economic and health threats to the United States
	Economic impact and trade deficits (Minor economic impact for US)	Affects the balance trade with US, Haitian dependency on external supply of food, import and export affected. More resources will need to be sent overseas to Haiti to support their struggling economy The situation in Haiti has an only a minor economic impact to the U.S. but carries a much larger social-cause factor.
	Unfair trade	We undercut Haitian farmers by requiring Haiti to buy our product (U.S) at a low cost. This affects both countries

Learning Assessment of ELMs

Table 3.2 presents the narratives/ responses of the learning assessment of the ELM at the end of the study. The students related the problems of low plantain productivity due to the high proliferation of the disease BSD. They found the lack of education of farmers, climatic change, financial constraint, poor extension and research programs exacerbated the problem of the BSD, which resulted in a low plantain productivity. This was accompanied by unsustainable practices such as deforestation and poor conservation measures which worsened the situation. Poor marketing channels were considered as a limiting factor for developing the sector.

The students understood that the black sigatoka was an air borne disease and also a geographic location and environmental phenomenon, which depended on the field elevation and isolation of certain fields which are drier and not downwind to other plots. Wet and dry areas have a bearing on the incidences of the spread of the disease. They reflected upon the different types of farmer's agronomic practices such as rotation of crops, lack of sanitations, proper plant density, importance of fertilizing of the soil and the types of varieties cultivated that influence the spread of the disease. They mentioned climate change as a precursor of worsening the disease outbreak with other challenges, such as isolation of farmers, lack of communication and collective actions among them, poor extension services network, lack of financial resource and low adoption rate which further aggravated the situation. Poor community-based research did not help either.

However, the control of the BSD was considered possible. They mentioned the importance of collective actions over an area wide management approach, however considered as challenging since the farmers are isolated. They stated that extension and research work should be encouraged by government policies which are vital for capacity building, improving

communication network, and providing technical information within a participatory approach. They provided insight on the possibility of the control of the disease within its own natural evolution.

Transformational education was considered essential for a change in the mind-set of farmers through training and education by extension services for adopting sustainable practices. The students also mentioned the importance of carrying out sustainable practices by farmers as vital for preserving the ecosystem, natural resources and habitat, while improving food productivity. They favored a participatory approach along with the provision of technical advice and training for controlling the fungal disease.

Financial aids were however considered essential for supporting agricultural production. This will allow the set-up of an extension service for supporting the farmers, by demonstrating sustainable practices for controlling the major pests and diseases for ensuring food security.

Table 3.2 Thematic Analysis of Narratives and Responses of Students from Learning Assessment Survey

	Themes	Narratives/ Responses of respondents
Why is there food insecurity where the soil is very fertile in Haiti?	Unsustainable practices	Deforestation leading to soil erosion of topsoil. Use of arable land for charcoal, no conservation measures
	Disease outbreak	The particular problem associated with food production in Haiti is the black sigatoka disease that has attacked the plantain
	Lack of adult/farmers education	Lack of knowledge and information on BSD, disease unattended, poor farming knowledge and practices, no resources like pesticides to deal with these issues and inefficiently utilizing their resources
	Marketing channels	Poor marketing channels, farmers don't have a way to get food to the markets or a communication network to discuss prices causing a price distortion
	Climatic conditions	Natural calamities, climate change, droughts and excess rain in some areas, which affect the overall crop production, a combination of the black sigatoka disease, poverty, natural disasters and environmental issues exacerbated the issues of poverty and food insecurity
	Financial constraints and poverty	Lack of finance, resources, pesticides and agricultural technology, inability to buy agricultural inputs, poor infrastructure and lack of agricultural technology and research, Haiti is overpopulated, average income is very low

(cont..)	Themes	Narratives/ Responses of respondents
Is it possible to control the Black Sigatoka disease with the limited resources available in the country?	Extension program, education, innovations and adoption of technology	Yes. Although it is a challenge educating farmers, it is possible through dissemination of information, adopting new innovations, improve sustainable agronomic management practices, biological control, use of pesticides and set up extension service programs for mitigating the spread of Black Sigatoka Difficult. A lack of an extension agent as a central point of communication and knowledge, along with the isolation of plantain farmers leads to a lack of a uniform response to the disease, lack of education, Lack of information on BSD, disease unattended, poor farming knowledge and practice
	Donations and aids from international organizations.	Yes. With financial support from US AID for purchase of agricultural inputs
	Natural disease cycle	Yes. Natural cycle of evolution of the disease, mutating a genetic "immune" response to this disease
	Poor resources	No, not likely. The plantain farmers need pesticides or biological control that they cannot afford. No, because the spores are present and the climate is conducive to the pathogen, control is no longer feasible.

(cont..)	Themes	Narratives/ Responses of respondents
Why do certain fields have lower incidences of the Black Sigatoka disease than others?	Geographical location	Certain field are isolated, topography, elevation of fields Black Sigatoka is airborne, so it can be difficult to contain. Fields that have never been exposed to the disease will naturally have lower rates of incidences of the disease Because the farms are typically quite spatially separated, and certain practices can help mitigate the issue Certain fields are drier and are not downwind from the others
	Environmental conditions	Air borne disease, climatic conditions, environmental factors (wet and dry areas), humidity
	Management practices	Different agronomic practices, lack of sanitations, proper drainage systems in field needed, proper plant density, weed control, certain fields have lower incidence based on whether the farmers realize there is a problem, and dealing with the infected plants properly, certain fields have better farming practices-such as avoiding excess irrigation and overcrowding, and using fungicides, soil fertility status.
	Resistance to disease	The type of variety cultivated and the different management practices of the farmers impact this

(cont..)	Themes	Narratives/ Responses of respondents
To what extent has climate change contributed towards the proliferation of the disease in Haiti??	Change in normal weather patterns	Temperature and rainfall (change outside normal pattern), Heavy rainfall and tropical climate temperatures, longer rainy season, warmer weather conditions. Climate change has had a major impact on the proliferation of the disease in Haiti
	Unsustainable practices	Climate change has caused a slow increase of the proliferation of the disease and things such as deforestation have only worsened the situation
How challenging to get all farmers to participate in integrated control of the disease	Isolation	Extremely challenging, remote locations, extremely challenging given the remote locations of certain villages
	Poor communication	Lack of infrastructure and communication, cooperation is key to controlling a widespread disease like this, however, it is difficult to do in an area like Haiti where cars, internet, phones, and other means of communication are obsolete
	Poor government policies	No extension and government support, weak extension service, lack of knowledge and organization
	Collective actions and Mind-set	Need an entire group of farmers to make a change, this will be a great challenge! controlling a plant disease is no different than controlling a human disease, I think it may be challenging because of Haiti's culture and their lack of organization

(cont..)	Themes	Narratives/ Responses of respondents
	Financial resources	Lack of financial support, need financial incentive for participants in the long run, lack of infrastructure and communication network in these areas
	Poor adoption rate	Difficult due to cultural differences between planter and extension agent, and disagreements, skeptical nature of farmers, cultural barrier Quite challenging, especially having to account for social capital
	Poor community-based research	Limited sustained effort and community-based research
What are the roles of extension services in supporting plantain growers in improving and managing their crops and its impact on the community?	Transformational Education	Vital to farmers education and support services, demonstrations on good management practices, ways to increase agricultural productivity. Has the required expertise to deal with food crops issues, help in identification of crop disease, causes, ways to control and/or prevent disease as well
	Collaborative actions, community building, participatory approach	Consultation with farmers, motivate farmers, teamwork, holistic approach to control the disease, dissemination of information, understand both the cultural and agricultural implications, informal education
	Profitable investment	Allow farmers to be more efficient, more competitive, better return on investment
	Sustainable practices	Improve crop productivity through sustainable measures, Finding suitable control measures, safe and effective use of pesticides

Conclusion

This case study evaluated the delivery processes of ELM as tools and identified ways ELMs could be implemented in courses with a focus on international development. The study of the ELMs online and through guided discussions provided interactive, vicarious experiences showing a virtual reality of micro worlds.

The ELM delivery instructions were drawn up with the educational objectives to allow an effective learning process. The online directives provided sufficient time to complete the different steps and exercises, which allowed a better understanding of the course content. It stimulated reflexivity, critical thinking, and a better internalization of new knowledge and cognitive skills acquired. It also encouraged and prompted better interactions among the students and the instructor. The findings from the reflective activities, class discussions and learning assessment exercises reflected the effectiveness of the instructional model proposed and the quality of the educational content of the ELM.

The findings of the pre-reflection survey showed that most of the students (90%) were not acquainted with the fungal disease affecting plantain production, even though they showed a good level of general knowledge about the country. The thematic analysis of the pre and post reflection survey revealed a high level of reflexivity and critical thinking by the students (Table 3.0 and 3.1). They encompassed a broad range of topics such as socio-economic, technical, cultural, political, educational and environmental, which also incorporated the structural problems, economy and trade imbalances, marketing aspects and agronomic practices to understand the complex phenomena of food insecurity.

The pre-reflection survey allowed us as instructors to realign our teaching strategies so as to fulfill the expectations of the students where themes like economy, trade and marketing, which were not developed in the ELMs, were taken on board during class discussions. The pre-

reflection surveys also gave us an idea of what is known and unfamiliar to the students, as general knowledge about the country and the topic under study. This provided a pluralistic approach which helped in keeping the interest of the students towards the completion of the study.

During the two class discussions (1.5 hours each), after the study of the ELM, we as authors shared our personal experiences while we were in Haiti, describing the scale of poverty witnessed. These experiences were further narrated through the personal videos recorded and pictures in the ELM

After the study of the ELM and class discussions, the post-reflective survey was conducted for assessing, how much new insight and knowledge were acquired by the students, their new perceptions, feelings and knowledge on the topic. It showed a high level of additional search and cognitive experiences within the classroom settings. The students understood the underlying complexity and dilemmas for achieving food security in the challenging conditions in Gressier, Haiti and demonstrated awareness about the problem and the potential strategies required for solving the problem. They realized that education of farmers was limited due to weak, unavailability of extension services. In a globalized context, they also reflected on how the situation in Haiti can affect the U.S. in the short and long term.

This post reflective exercise indicated a high degree of self-development among the students, taking a responsible and global mindset. The students also learned about the enormous challenges of the country, which is plagued with poor financial resources, poor government policies and a heavy dependency on importation.

Along with the study of the ELM, the students mentioned the necessity and importance of community based research, international policies for providing help and food aid, social and human capital for building resilience, coordination of stakeholders for making better impact, the

involvement of social organizations, the adaptation to climate change and the awareness of the negative effects of deforestations for achieving a sustainable rural development. The class discussions were centered around causes of poverty, food insecurity, malnutrition and potential solutions for alleviating them. The students also responded by doing independent research on the subject and felt interested to engage in community development in the future.

From the learning assessment exercise (Table 3.2), the students provided a holistic view on what they learned: the challenges of the farming community, how plantain is interrelated to food security, the importance of transformational education and extension outreach programs, sustainability practices, benefits of collective actions and capacity building, participatory approach, financial aspects, need of government policies, need of technical expertise and research, adaptation to climate change and importance of foreign aids (financial and expertise). The learner was centralized as a constructive contributor for what can eventually be understood. It would be interesting to see how this influences their career orientation in the long run.

They found the process helpful, guiding them towards the educational objectives of the ELM studied. Nevertheless, there were still scope for improving the teaching methods and the curricula for a better educational impact. It is being proposed that the pre-reflection exercise should be followed by selected readings on the topics that will improve the student's general knowledge about the country and the socio-economic status before they study the ELMs.

Studying one ELM is inadequate for understanding the "multiple realities" (Schutz, 1967) of the causes and problems related to food insecurity and human sufferings in Haiti. The study of nine ELMs within the course is being proposed as a capstone for understanding the multiple facts of food insecurity. Students should study at least three ELMs of his/her interest out of nine selected ELMs by the classroom students and come with salient features to discuss the findings, along with additional research. As studying and bringing his /her own subjectivity and viewpoint

on the ELMs remained an individual process, group tasks and discussion on common themes for exchanging of ideas would deepen the explanatory nature of the study. Group presentations could also be considered to cover the nine selected ELMs for a broader view of the problems of agricultural developments in Haiti, the problems associated with poverty, the different glitches related to food insecurity and to propose potential underlying solutions. The challenge of interconnecting the students with food insecurity and human sufferings problems in a globalized context was fairly met within the resources available and context of this study. The proper flow of instructions was vital to guide the students toward the successful completion of the ELM. Instructions set the proper steps for the learning process to occur to which they embarked individually.

This case study about the learning of plantain ELM met its educational objective to prepare students for solving globally interconnected, prevailing and future food insecurity problems. The study of ELMs has made a successful attempt of bring a vicarious experience for the classroom learner. Since international service learning is limited to a certain number of participants, the study of ELMs within a classroom setting can help prepare students from a diverse background. Improving such curricula will help students to better understand career opportunities and educational options (Faulkner, Baggett, Bowen, & Bowen, 2009). The findings from the survey and suggestions showed that the educational learning objectives were met to the best of the ability of the instructor.

This study of the plantain ELM, as a case study allowed the design of an instructional delivery, which proved to be effective. The students have a high level of involvement in researching, reading, reflecting, participating and assessing the learnings during the study of the ELM. The study of ELMs in a classroom setting reaches potentially a wider range of students from diverse fields with diverse levels of expertise. Students interested in an international career

need to be aware of the needs of the poor and the challenges of developing countries. The students need to be empowered to become informed citizens to address the problems and causes of poverty.

To assess the effectiveness in delivering the vicarious experience at the classroom level, the delivery instructions needs to be evaluated continuously. The feedback received from the students would help to realign the tools and enhance the experiential learning. The educators must understand the fusion point between students previously and with newly acquired knowledge, which is defined by a collective agreement between the practitioners and the knowledge community within the classroom setting.

The delivery method proposed is flexible and additional research is required to assess the impact and evaluation of the proposal of the study of three ELMs per student, out of nine selected to be covered by the class. This would increase the level of general knowledge and perspectives of different topics related to food insecurity and human sufferings.

ELMs could be used in various ways, including as the foundation for new courses, incorporated into on-going courses, a model for developing other ELMs, or presented individually at seminars and workshops addressing issues on international development.

This study concludes that there is scope for the use of ELMs in teaching international agricultural development in poor developing countries to students for them to become informed citizens who will contribute toward solving globally interconnected food insecurity challenges.

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Appendix 1

Plantain and Banana in Haiti Experiential Learning Module (ELM)

INSTRUCTIONS FOR STUDENT USE TO ACCESS ELM

FIVE STEPS: **#4 in Class;** *others on your own in sequence*

You are submitting text entry through a SharePoint site

1. **Go to website** https://alec.tamu.edu/impact/agricultural-education-in-haiti/

a. Read under the theme "Developing Global-Ready Agriculturists through Experiential

Learning Modules: Solving Problems of Food Insecurity & Human Suffering in Haiti" –

b. **What is an Experiential Learning Module?**

An Experiential Learning Module or ELM is a multimedia presentation based on the four

adaptive modes of Kolb's Learning Cycle (1984). ELMs contain pictures or video and

voice over presentations to create an active vicarious experience for the classroom

learner. Each ELM includes specific objectives based on identified needs related to food

security and human suffering. Each ELM also describes the background information of

the need identified by the target audience and will include author/developer pair

members' perceptions of Haiti such as culture, history, economy, and religion.

2. **Before reading the ELM please answer these pre-reflection questions** – (link

provided in Canvas)

   a. What much do you know about Haiti?

   b. What are some challenges and problems the country is facing?

   c. How is plantain/banana production important to Haitians?

   d. Have you heard of the disease Black sigatoka?

   e. What do you expect to find out from the ELM on Plantain in Haiti?

3. **Choose to read the topic: Sustainable Management Practices of Plantain in Haiti With Emphasis on The Control of the Disease Black Sigatoka**

   Go to link: Sustainable Management Practices of Plantain In Haiti With Emphasis on The Control of the Disease Black Sigatoka

Read the PPT slides in the module and listen to the narrative.

4. **Take time to read ELM and keep a reflective journal if possible.**

   a. Take note on the background on Haiti – What you have you learnt more?

   b. Take note on the information gathered from the background knowledge, concrete experience, reflective observation, abstract conceptualization and the active experimentation. Think of the process involved.

   c. Reflect on the information obtained and bring your own conclusion.

   d. How this situation in Haiti affects the USA?

   e. Any information you would like to add from your own search.

5. **Post Reflection questions –** (link provided in Canvas) - Questions

   a. What are the main points you learned about Haiti from the ELM?

   b. How did the ELMs affect your though and feelings about Haiti?

   c. The main conclusions you draw about plantation production on Haiti.

   d. How do you think the situation in Haiti affects what happens in the US??

6. **Complete the Learning Assessment section (Black Sigatoka in Plantain) and answer the questions with your own subjectivity and reflexivity?) (**link provided in Canvas).

   Questions (Take survey)

   a. Why is there food insecurity where the soil is very fertile in Haiti?

b. Is it possible to control the Black Sigatoka disease with the limited resources available in the country?

c. Why do certain fields have lower incidences of the Black Sigatoka disease than others?

d. To what extent has climate change contributed towards the proliferation of the disease in Haiti?

e. How challenging to get all farmers to participate in integrated control of the disease?

f. What are the roles of extension services in supporting plantain growers in improving and managing their crops and its impact on the community?

Keep notes for submission and think about what you like about the ELM and things that might be improved.

Chapter 4: Assessing Change and Consequences of Experiential Learning based on International Service Projects in Haiti
Abstract

An International service learning (ISL) program allowed 15 graduate students from the Auburn University, Texas A&M University and Sam Houston University, to develop experiential learning modules educational tools, with the learning objective for solving the problem of food insecurity and malnutrition in Haiti. It is becoming increasingly important and integrated into the curriculum of agricultural education to prepare global ready agriculturalists. The purpose of this study is to assess the impact of the EL gained by students during the ISL in Haiti, what they gained initially as tools, knowledge and understanding. This study used a survey questionnaire, with Likert and open-ended questions, for analyzing pre and post trip reflections and was administered through Qualtrics. The findings revealed that the students found pre-trip preparations as vital for the service learning in Haiti. Despite their poor competency of the local language, it was not a barrier for the immersive experiences. Pre-trip reflections, planning and preparation helped for a better immersive experience. The short-term program of one week for the ISL was however considered too short. The post-trip reflections revealed a high level of critical thinking and reflective processes, engaging in logical reasoning. The EL positively impacted their learning processes, improved their meta-cognitive skills, and heightened their ability to carry out community study. The six learning areas (Pless at. al, 2011), responsible mind-set, ethical literacy, cultural intelligence, global mind-set, self-development and community building were consistently met along the EL. Theoretical foundations were also successfully fulfilled for an ISL: civic education and service learning, cross cultural adjustment, transformational learning, participatory research, development and collaboration (Crabtree, 2008). The ISL provided the opportunity for international education, community-based research, and service learning, which enabled the student's global awareness, development of human

values, intercultural understanding and communications, civic mindedness and leadership skills. Since, this study was conducted with only a sample size of 10 participants, the results of the correlation represent an illustrative pilot effort, showing ISL as enhancing the student's metacognitive skills and abilities. This study serves as a template for proposing recommendations for improving ISL for similar programs as well.

Keywords: International service learning, experiential learning, pre-trip and post trip reflections, intercultural understanding, self-development, civic-engagement, global mind-set, community study.

Introduction

International service learning (ISL) is becoming increasingly important and integrated into the curriculum of agricultural education across universities in the United States. However, agriculturally focused colleges have the fewest study abroad participants within U.S. universities (Institute of International Education, 2018). The importance of real-life experiences for agricultural graduates have become essential, since they allow the students to understand the complexity of agricultural developments in developing countries. Higher education institutions in the U.S have recognized the importance of becoming sensitive and aware of global issues (Tarrant, 2010., Panina & Lane, 2018).

Previous researchers found that ISL have promoted intercultural sensitivity, empathy, or attitudes towards the environment (Rexeisen & Al-Khatib, 2009), which also fosters interdependency in a globalized context, allowing a first-hand experience on global poverty and human sufferings in the developing world (Mick & Frabutt, 2017). There is a pressing need for higher educational institutions in the U.S., to produce globally minded and civically engaged students (Crabtree, 2008). This ISL in Haiti allowed an immersive experience while developing experiential learning modules (ELMs) which are instructional materials based on Kolb's learning model.

The educational objective of the ELM is to solve problems pertaining to food insecurity and human suffering in Haiti. This project on developing ELMs aligned itself with Sternberger, Ford and Hale (2005), who described service learning as "a form of experiential education in which students engage in activities that address human and community needs together with structured opportunities intentionally designed to promote student learning and development" (p. 77). This service learning allows students to experience the level of poverty in Haiti.

The country of Haiti provided the appropriate environmental and socio-economic challenges for an immersive experience. Three group visits were undertaken between May 2016 and May 2017, where 15 graduate students from Texas A&M, Auburn University, and Sam Houston University participated in ISL program. The Christianville Foundation Inc. and Thomazeau Foundation, both reliable non-profit organizations, provided suitable host organizations for incorporating the service learning within a short-term period (one week) (Figure 4-1).
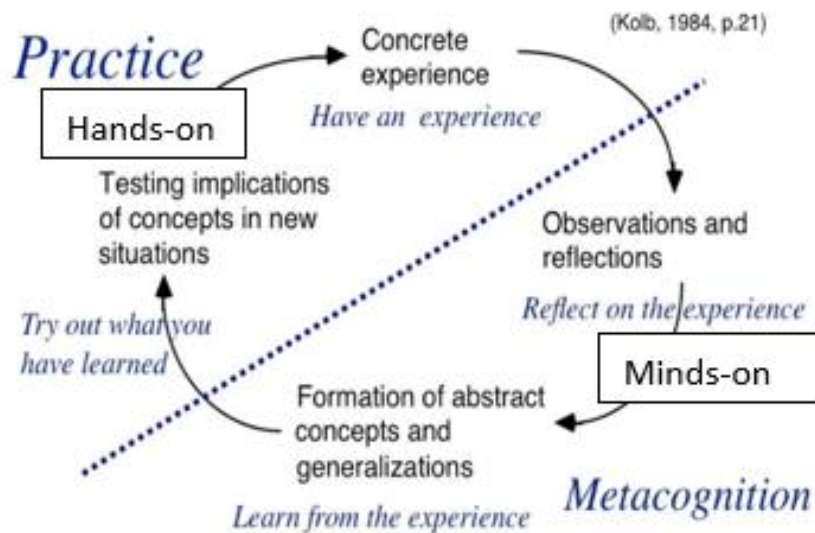
Figure 4-1: Experiential Learning Cycle. (Source: Adapted from Kolb, 1984, p, 21)

The process of developing ELMs allowed an experiential learning (EL) with effective learning, where concrete experiences permit new observation and reflections on the experience (Baker & Robinson, 2016). Pless, Maak and Stahl (2011) found that service learning in an international context has impacted six learning areas through developing a responsible and global mind-set in understanding global issues, acknowledging ethical knowledge and understanding cultural diversity, self-development, and community building. The ISL in Haiti had similar objectives while keeping focus on agricultural developmental issues.

The foundational work of Crabtree was used for assessing ISL program and experiences. It merged civic education, cross cultural immersion, transformational learning, participatory approach, development and collaboration for a good ISL program. These overlapping components were adapted and used to assess the ISL in Haiti, which in turn provide an insight into the effectiveness of the impact of the EL.

The purpose of this study is to assess the impact of the EL gained by the students during the ISL, on what they gained initially as tools, knowledge and understanding. It also includes participant's perceived changes on their critical thinking meta-cognitive skills (Pless et at. 2011). The participants were graduate students mainly from agricultural international development courses.

The rationale of the study is to ensure that ELMs are advocated, where limited empirical work assessed the nature and extent of impacts that these tools have on the learner.

The significance of this study is to show how the EL contributed towards preparing students to become informed citizens and professionals ready to face real world problems.

The impact of experiential learning (EL) has been evaluated in many related educational and medical fields (Ernst, 2013., Baker and Robinson, 2012., Chavan, 2009, McPhee and Przedpelska., 1987). However, evaluative studies of graduate students who have service learning, community-based learning and EL in the field of agriculture in an international context have not yet been fully explored. This paper intends to clarify and extend the use of EL as an educational tool.

This EL will prepare our agricultural students to solve the issues of poverty, food insecurity and malnutrition and other problems related to agricultural developments in an international context. The impact could also benefit their community of service or at their working place, which will contribute toward community development. The findings for this

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study are considered important as it will permit to propose recommendations for improving the experiences of students for similar ISL.

This study about the assessment of EL through an international service-learning program about agricultural development in Haiti is timely. There are many poor developing countries facing similar problems and there is a need to prepare agriculturalists in a globalized context for solving the problems of food insecurity and malnutrition.

The Origin and Evolution of ELMs

Why Experiential Learning?

Rogers (1969) described EL as a means through which students could grasp their "natural potential of learning" (p. 114) enhancing their leadership skills and preparing them for proactive community engagement. EL is about "constructing knowledge and meaning from real life experience which allowed the progress of new theories through new understandings" (Kolb, 1984, p.32), where the learning process and valuable knowledge are enhanced by transformation of experiences (Kolb & Kolb, 2009). Traditional pedagogical approaches have always favored the final product over the process of education, which has limited science students to reach their full potential (Budd et. al., 2015). EL prospects offered learners action-based possibilities based on real-life conditions or "primary research that engages them in reflective problem-solving with multiple potential avenues of inquiry" (Center of Teaching and Learning, 2018, p. 1) and as an internalized learning associated with both work and life (Blower & Parsons, 1989., Thomas, 1988).

Young (2002), described Kolb`s EL as two integral parts, the hand-on "concrete experiences providing the basis for the learning process for engaging, motivating and evoking the affective (feeling) aspects of experience", and the mind-on "conceptual knowledge

representing the facts, concepts and their interrelationships applied to a specific domain" (p.44) (Figure 4-1).

The ELMs were built on the same principles. On the hands-on side, Young (2002) suggested that concrete experience could connect academic learning to the real world. Active experimentation tested the concepts conceived from conceptualization through outdoor or field works. On the minds-on side, reflective observation explored the concrete experiences and created meanings along with active experimentation. Abstract conceptualization allowed the integration of theories and concepts into the learning process.

Budd et. al. (2015) based on Dewey (1973) stated that " without a connection to experience there is likely to be a gap between the subject matter learned and the interest in the subject matter"(p. 2). He further emphasized that the experience was contained in the social, and the matter of learning and experience depended on the individual or student social acivities with the teachers facilitating the process of growth and development. Students who have more experience in a particular field would be more performant than one without it along their roles "as adults as contributing citizens of society" (Blower and Parsons.,1989., Knobloch, 2003, p. 32). Itin (1999) and Resnik (1987) emphasized the development of critically thinking and self-motivated problem-solving that individuals need for community development.

EL curricula have a positive impact on students supporting a deeper understanding and complex working knowledge (Steinke and Buresh, 2002) with a higher learning outcome than non-experiential courses (Markus, Howard & King, 1993). However, Kendricks (1996) found no statistical difference between the grades of two undergraduate courses with one containing extensive EL component amd the other without it. Cohen and Kinsey (1994) only found a higher self-reported level of motivation and no statistical significance in course performance.

Research supporting EL in agricultural education in an international context is limited. The assessment of the developers of the ELMs would contribute towards addressing this limitation. This study brings insights on how EL benefits graduate students and hence support for experiential educational learning within their curriculum. Agricultural students enrolled in international development courses need a supportive environment and quality education for the provision of knowledge which could be proved useful to them. EL has been conceived as a foundation for social change, personal growth and development (Budd et. al., 2015., Weil & Mc Gill., 1989 and Javis, 2010). They see EL as transformational and critical to service learning grounded in the content of graduate curriculum.

EL that is not reflected upon can lead to presuppositions and misconceptions. Reflection supports self assessment and monitoring of one`s own comprehension.

Reflection: A Crucial Component in EL

Experiences that are not reflected upon created controversy, support presuppositions and stereotyping, but when thoughtful and analyzed, generalizations could be made that could influence further actions (Dewey, 1973).

People sometimes are reluctant to change from original experiences, pre-conceived ideas or abstract ideas despite being proved inaccurate.This led to the conclusion that EL should always be accompanied by reflexivity (Cunningham, 2007). Rogers (1969) mentioned that "EL starts with students facing real-life problems relevant to their lives which encourages learning beyond classroom" (p. 114) emcompassing community based research. EL has a role and impact on community engagement, participatory learning and reflection which in turn could allow transformation to occur within a society (Budd et. al., 2015).

Agricultural International Service Learning in the U.S.

International agricultural programs are being offered by universities in the U.S. for addressing problems and building up programs that are relevent to the real world (Institute of International Education, 2018). There are developing nations in conflict and post-conflict siutations directly impacting national security in U.S. organizations, both governmental and non-governmental, as well as the private sector which have been involved in the provision of humanitarian aid and developmental efforts. The need to develop high impact experiences for students is becoming persistently relevant. Agriculture in the global context needs students to have a global perspective and skill to understand the complex interelationship of this sector (Shinn et al., 2009., Rickets & Morgan, 2009). Navarro (2004) pointed out that agricultural colleges have to be oriented in preparing their students to 'live and compete' in a global society. These findings reinforced the concept of educating graduate students in better preparing them to embrace careers with already developed experiences in that particular field.

Cantor (1995) stated that universities have to develop curiculum where higher education could prepare students in engaging in community economic development. This has the aim of expanding their careers in international agricultural development with emphasis on rural development and extension agenda.

Experiential Learning Module : An Experiential Learning Process

ELMs connected the course content to the experience lived. It was an "intentional consideration of an experience in light of particular learning objectives" (Hatcher and Bringle, 2000, p. 153), applying the learning in diverse contextual situations while enhancing personal growth (Daudeline, 1996., Garner, 2000). Agricultural educators have advocated for a teaching approach, blending both instructions and EL for a balanced growth (Baker & Robinson, 2016).

The process, while developing the ELMs, was looked at as a learning process along with the knowledge generated. It could be explained by the mixtures of primary and secondary experiences and learning beyond their personal limits, becoming also accountable for their own findings and conclusions (Chapman, Mc Phee & Proudman, 1995). This encompassed the physical as well as the social environment, where the students were working in a diverse cultural environment.

Garner (2000) criticized the Kolbs ELT, where he deducted that " the use of Kolb is not synonymous with the concept of assigning students to learning styles and associating those with degree courses". However, the ELM was based on the four learning styles of Kolb's Learning Cycle (1984), which considered learning as most effective when all the four modes of learning are combined (Kolb, 1981) (Figure 1-1).

The developers of the ELMs with pre-conceived notions would expect to interact in their own way, to have life-long learning, certainly contributing towards their academic, professional , and personal achievements. Community-engaged learning combining teaching, research, conventional service, and student participation has become a growing trend in higher education (Mehra, 2009). The process of the development of ELMs share the same principles.

Developers of the ELMs have come from a diverse range of agricultural fields, and the ELMs have provided an innovative way of integrating scientific research experiences into educational curriculum with an authentic experience. They provide the potential for high impact learning experiences with possible benefits for the students; such as increasing their awareness on the sensitivity of the poverty, food insecurity, and malnutrition in a poor developing country; the ability to work in culturally diverse settings; working and reflecting on locally adaptive technical and scientific skills; and developing empathy for marginalized groups.

Preliminary Preparations for Immersive Experience

Preliminary meetings through conference calls were organized with faculty members, the operation manager of Christianville Foundation, and graduate students so as to better prepare for the immersive experiences. The meetings explained the purpose of the trip, as well as increase the knowledge about the host country. Travel arrangements were discussed including details about lodging, meals, dress code and the Haitian culture. This exercise prepared the students to encounter the socio-economic and political realities of the host country within a different cultural setting (Urraca, Ledoux & Harris, 2009). It also reinforced an understanding of the challenges and constraints of the community to be researched. A tentative agenda for the visit at the hosting NGO was shared. The students were fully informed and equipped with valuable information for a smooth and enjoyable experience. The conference calls proved to be essential and very useful to the students.

The level of poverty was extreme, and students could find themselves unsettled with these unusual situations, as they may have never seen or experienced them in the United States. The summary of expectations as concerned with the development of the ELMs was thoroughly discussed, allowing students to have direct ownership of the project. Clarifications were made and the deliverables were well established, guiding our experiences in the context of learning (Crabtree, 2008). This clarification and understanding were of upmost importance for this short trip abroad. Linguistic competency was favored, so as to better communicate and have a deeper immersive experience while abroad.

Pre-Trip Reflection

The pre-trip reflection helped at evaluating whether the pre-trip preparations were helpful in assisting the developers of ELMs with the tools and knowledge for the immersive experiences and the tasks of developing the ELMs. The development of ELMs itself allowed the EL to occur

simultaneously. There was also the notion of concomitant variables as already acquired experiences within their field of work (Ewert & Sibthorp, 2009).

A pre-reflective survey was carried out to learn about the students` previous experiences, perceptions, and expectations, which would eventually help give them a meaningful experience (Le & Raven, 2015). We looked forward to the trip and to understanding Haitians daily problems, their survival strategies to sustain a living, the challenges they face and their view of the world. This trip to Haiti was an eye-opener and a living experience essential for developing ELMs for addressing the community challenges and problems. There was an expectation to bond with the community, to augment civic engagements, and to take social actions when returning home. We expected to have a transformational experience and anticipated that the development of the ELMs would trigger outreach programs for helping the local community. The process of learning went along the process, cumulating towards the end with the completion of the modules.

Post-Trip Reflection

The personal learning experiences which allowed to assess the EL that occurred is the main experience. It consisted of evaluating; whether the process of developing the ELMs were challenging, the culture shock, the personal growth and transformational learning, the ability to be more creative in solving complex problems of food insecurity, the realities of the level of poverty and the ability to connect course content to real world.

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Assessing Impact on Experiential Learning

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The criteria for assessing the EL was determined by the learning processes while developing the ELMs, the impact and change it has on the students and the overall improvement on their meta-cognitive skills, career, leadership skills and mind set. These findings from these three sets of criteria will determine whether the overall objective of "solving globally complex

and interconnected, prevailing and future food Insecurity problems and human sufferings" has been achieved.

It is important to describe the foundational framework that developed the ELMs, which also allowed the EL to occur. The development of the ELMs and the transformation of experiences was undergirded by the Kolb's ELT, which is a holistic educational structure (Kolb, 1984). The experiential instructions and learnings were characterized by (i) the continuous learning process following the inductive and deductive cycle of research, grounded in experience; (ii) conceiving as a process rather than an outcome; (iii) learning as a holistic process of adaptation to the world; (iv) transactions between the person and the environment; and (v) the process of creating knowledge (Kolb & Kolb, 2009).

In order to assess the students about their EL, the foundational work of DCAL on EL was considered as a template for designing the survey questions. (See Appendix A). The conceptual framework devised (Figure 4-2), consists of the learning processes that include the personal learning experiences (EL), critical thinking and reflective practices.

The personal experiences relate to the immersive experiences, the problems of food insecurity, the building up of knowledge, connection to the realities of the level of poverty of developing world, being creative, having a transformational learning, enhancing the course content covered at college, and intercultural adaptations.

The critical thinking construct was evaluating the observations, presuppositions, logical reasoning and transformation of experiences into knowledge and ability to solve problems

The reflective practices evaluated the new mind-set, experiences beyond textbooks, generating new hypothesis, views of the community, rethinking of what is important for food security and rural development.

The component of impact and change determined the ability to undertake community studies, have civic responsibility, ability to solve interconnected food insecurity problems, improvement in communication skills, understanding of diverse cultures and improved knowledge on Haiti.

The Learning Process (EL)

Experiential Learning
CE, RO, AC, AE

Critical Thinking and Reflexivity

Connect theory to practice

The Personal Learning Experiences
Enjoyable
Knowledge enhanced
Creativity
Connection to developing world
Problems of food insecurity and human sufferings
Solving complex problems
Understanding diverse cultures

Impact and Change

Improve student learning process
Ability to solve complex problems
Take decisions in situation of uncertainties
Collaboration across cultural differences
Improve communication skills
Innovate and take responsibility
Self -confidence

Overall Improvement

Critical thinking,
Improve leadership skills
Change views of the developing world
Ability to solve food insecurity problems in developing

Overall Objective

Solve globally complex and interconnected, prevailing and future food Insecurity problems and human sufferings
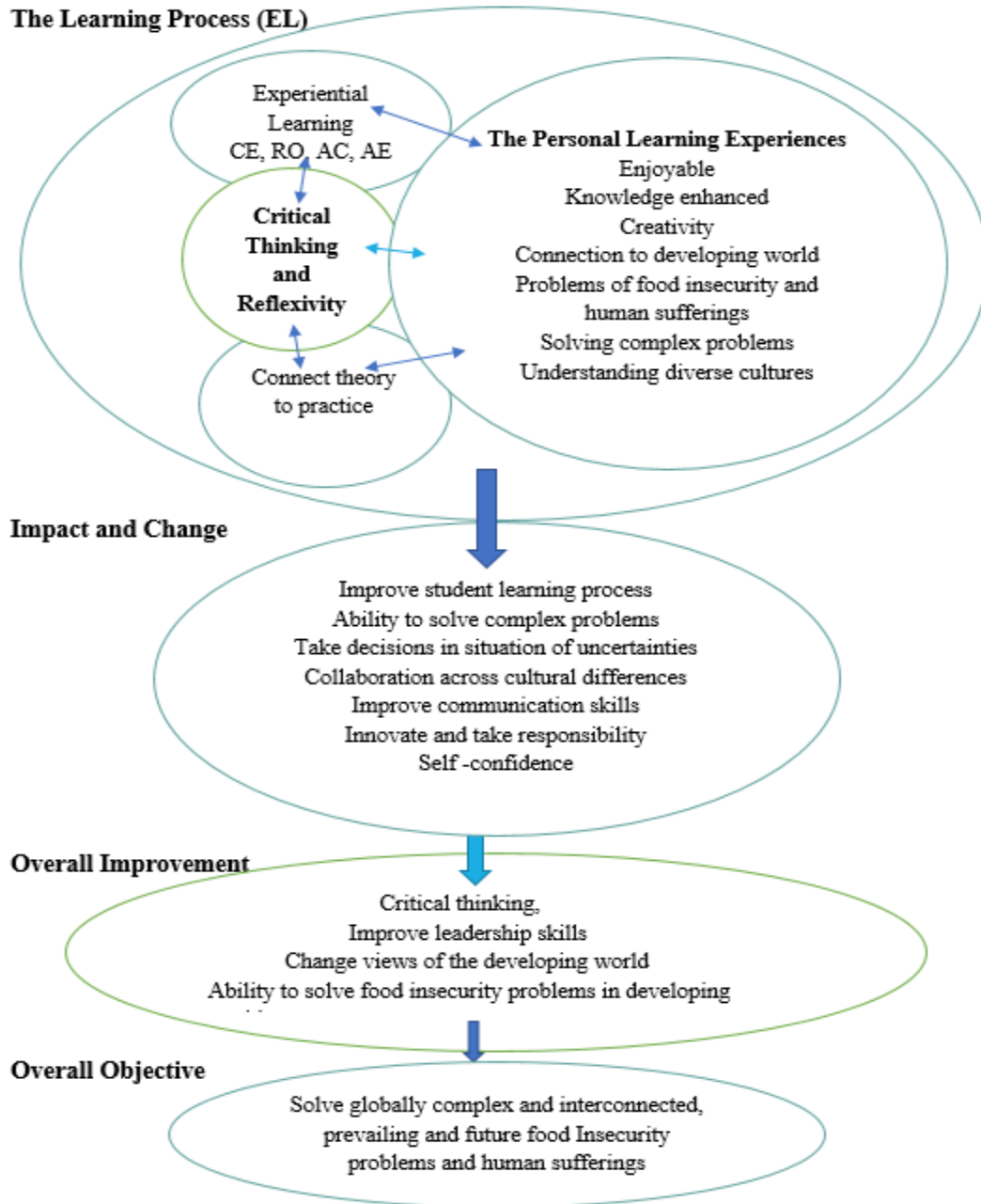
Figure 4-2: Conceptual Framework Showing Impact and Consequences of Experiential Learning on Developers of ELMs

A positive impact and change would result toward an overall improvement which is determined by the ability to connect learned skills with professional life, civic responsibility, professional development, self-confidence and ability to engage in community development, expanding career opportunities, and improving leadership skills (Figure 4-2).

The evidence of learning based on the six criteria by Pless et al. (2011) was adapted to this study and was used for analyzing the survey questions. The Crabtree (2008) theoretical foundation and protocols was used for evaluating the international service-learning program, which in turn determines the efficacy of the EL. It consisted of combining "civic education, cross-cultural immersion and relationship building, community development work, shared inquiry for problem-solving and change, and powerful learning experiences grounded in critical reflection (p. 28)".

These criteria will define whether the EL have a positive impact on the students, so that they meet the overall objective of the project in preparing global ready students for solving prevailing problems of future food insecurity problems sufferings in poor developing countries.

The Crabtree theoretical foundations on ISL and that of DCAL on EL was also used for triangulation purposes.

Method

This study entails a questionnaire survey design with Likert and open-ended questions (Appendix B) based on the foundational work of Dartmouth Learning Center to reflect on the EL. The open-ended questions provide a deep explanatory nature of the investigation. There was a follow up with the participants when needed for clarifying any explanations.

The target population was developers of the ELMs, who made the trip to Haiti through the ISL program. They were graduate students from Texas A&M University, Auburn University and Sam Houston University. The whole population was taken on the survey which consisted of

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fifteen respondents. It was a purposive sampling. The respondents were recruited from the website which published the ELMs, providing their email addresses and contact details.

A pre-test of the survey was carried out to test the reliability of the survey methods and design. The think aloud study was conducted with two students to evaluate the quality of the survey items who were also representative of the sample. It helped in improving the survey design. Evaluation of impact entailed the following: measurement of change in perception and metacognitive skills through a survey/questionnaire, consisting of Likert and open-ended questions.

The online survey was administered through the Qualtrics program and considered as the most convenient method. The survey consisted of a cover letter and the purpose of the study (Appendix B). A second reminder was sent for non-response after two weeks. Ample time (1 month) was provided for completing the survey. These strategies were considered helpful for reaching a satisfactory or desired response rate (Schaefer & Dillman, 1998).

The open-ended responses have been classified under these categories: Pre-trip reflections and post-trip reflections (immersive experiences and change in perspective, and enhancement of academic content). The open-ended questions aimed at deepening the explanatory nature of the findings.

The Likert evaluation responses fell under these categories: learning process (personal learning experiences, critical thinking, reflective practices), impact and change, and overall improvement. The main construct consists of learning processes (which includes sub constructs; the personal learning experiences (EL) – 8 items, critical thinking – 6 items, reflective practices – 7 items), the impact and change (8 items) and the overall improvement (5 items) for measuring these two main construct as well.

The survey used Likert-type 5-point scales (1 = strongly agree, 2 = agree, 3 = neither agree or disagree, 4 = disagree and 5 = strongly disagree).

Since the population is relatively small (15) and the response rate satisfactory with 10 respondents (66% of population), descriptive statistics was used for the Likert questions. The scale score of statistical means were used for evaluation purposes, as it brought consistency with other scales. The average mean of each item and each main construct (item means) were analyzed to provide feedback on them. Reliability test such as Cronbach alpha based on standardized items was performed to measure the internal consistency of the findings. The open-ended responses were analyzed through a thematic analysis.

Spearman's Rho is a non-parametric test used to measure the strength of association among variables, where the value r = 1 means a perfect positive correlation and the value r = -1 means a perfect negative correlation. This test was carried out to explore the relationships among the three main constructs; overall improvement as dependent variable which was correlated with the independent variables; learning process combining the means of the scales (personal learning experiences, critical thinking and reflective practices); and the impact and change. The objective is to evaluate whether the learning process has a positive impact and change on the students which in turn would result in an overall improvement.

The survey and mainly the open-ended responses were analyzed thematically using the framework of Pless et al. 2011 which was adapted to reflect service-learning content in Haiti. The ISL program was analyzed with the key learning principles by Crabtree (2008), needed for an effective international service-learning program. Triangulation was carried out from the two sources, DCAL (2017) and Crabtree (2008).

It is hypothesized that the EL in Haiti will impact positively on improving the metacognitive skills of the graduate student, causing an impact and change that will result with

an overall improvement on acquiring tools and knowledge for better solving globally complex and interconnected, prevailing and future food insecurity problems in poor developing countries (Figure 4-2).

Validity and Reliability of the Study

There are three categories of potential threats in this study; the construct validity of causes and effect, the external validity and the internal validity and the content validity referring to the relationship of one or more measures to a given construct. The possibility to measure all the facets of a construct is small, hence, to increase the validity of this survey research multiple measures of the same construct was constructed. The construct measuring the impact of EL was broken down into three main sub-constructs and were connected to each other under a flow design: learning process, impact and change and overall improvement on the students (Figure 4-2). These were in turn broken down into several mini constructs or questions for explaining the main statement.

Content validity goes hand in hand with the construct validity. Concrete measures through Likert questions with five points scale, from strongly agree to strongly disagree, were devised to measure the same. The survey questionnaire also contained open-ended questions to go more in depth of the constructs and the related measures.

The findings of the research were expected to be generalized to its inferential population which brings the notion of external validity. The results could be used to help understand how the ISL indeed enhanced the experience and the meta-cognitive skills of the students. The development of ELMs was carried out in Haiti, where the benefits of the EL could be generalized to other similar programs.

The reliability of this survey design relied mostly on the timely of the survey and when it was administered. The project was completed

by May 2017 and the survey administered in February 2019 when the students, who were on the ISL project, had ample time to adjust back into their social and professional environment. The effect and benefits of the impact of EL would be felt along this long-life experience. How the developers of ELM would react to a survey assessing the benefits of the learning over a longitudinal survey stills need to be evaluated. However, the study still has to be replicated with similar research background to provide more consistency and reliability upon the findings.

Measures

The survey questionnaire consisted of main constructs under a statement and sub construct measuring the same. The concise definitions of each construct stand as follows (Table 4.0).

Findings

The response rate of the survey was 66% which was ten respondents out of a population of 15. This section presents the results of narrative content analysis of open-ended questions, on the evidence of learning based on the six areas described in Pless et al. (2011). It also includes the responses from the Likert questions under the different categories and the Spearman's correlation determining the relationship among overall impact, the learning process and impact and change.

Table 4.0 Summary of Measures used in Analysis

Concept	Nominal Definitions
Challenging	Did you come across any difficulty while working on the ELM interesting
Knowledge enhanced	Did the EL allowed you to learn something new
Connections to developing world	Have you been able to make the link on what is going in the developing countries
Critical thinking	Is about making reasoned judgments that are logical and carefully considered and planned
Reflection	Has the EL changed your view of the world beyond your thinking
Construct knowledge	Has the EL allowed the transformation of the experiences into concrete knowledge
Beyond usual thinking	Has the EL taken you out of your comfort zone
Innovative ways	Application of new ideas into the real world for making an impact or change for a better living
Situation of uncertainties	How far you were confident in situations of unpredictable, and uncontrollable outcome.
Complex situation	To solve issues in a sensitive and compounded socio, economic and political environment
Culturally diverse	Working in a different social setting that is different and new to yours
Connect theory to practice	How far you applied theoretical background into the practical way or context
Bridge learned skills and professional life	How far the experience helped you to fill your skill gap you were missing in your career

Pre-Trip Reflections

The pre-trip evaluation allowed us to understand the presuppositions, expectations of the ISL and students level of preparedness towards the trip. 80% of the students were familiar with ISL, have had volunteering experiences, and found the pre-departure meetings vital for their preparations. The students felt prepared for facing the realities of poverty in Haiti. Students will have to encounter with the people and have a basic understanding of the tasks needed to build ELMs. However, 20% of the students felt confused and unprepared for the trip, as they mentioned that there is never enough information for such kind of trips. The level of preparedness for building the ELMs were considered insufficient to them. 70% of the respondents showed that they were familiar with the current situations in Haiti, but only 50% have a preconceived idea of possible researchable topics they would undertake. However, 80% showed more likelihood to investigate within their respective fields. 80% of the students showed lack of competency of the local language (Appendix A: Tables 4.1 and 4.2).

The findings also revealed that the students were willing to learn more about the Haitian culture and contribute with their own expertise toward developing strategies for combating food insecurity and malnutrition. They also wanted experience with international challenges and international community-building to better prepare them for an international career. There was also willingness to increase their knowledge and aptitude in viewing developmental work from a non-missionary approach. It was an opportunity to research a challenging context as well and they were looking forward to an intercultural exchange.

Post Trip-Reflections

Table 4.3, 4.4 and 4.5 (Appendix A) summarizes the post-trip reflections evaluation which provides details on the usefulness of the SL; through the immersive experiences, change in perspectives and enhancement of academic content acquired. The findings showed that the

students were able to diagnose the central problem of food insecurity, which they related to poverty, poor agricultural productivity, corruption, lack of infrastructure and education. However, they found the trip challenging because they had to produce the ELMs during a short time. The short-term program seemed to be insufficient for the immersive experience .They were confronted with rough roads during their travel and were also unwelcome in certain places. The experiences of seeing people in deep poverty and malnourishment was overwhelming. Nevertheless, there were good moments such as interaction with the kids at school, conversations with employees at the NGO, and more educational learning about the culture. There was an apprehension towards the potential impact they could make that could benefit the community. Educating the staff of the NGO on protein diet, building good memories with the community and sharing expertise with the Haitian agriculturists were considered as a positive experience. The ELMs will provide support and initiate developmental programs which need longitudinal appraisal.

The post-trip reflections on the potential change in perspective and mind-set revealed that the students portrayed Haiti as very challenging, which was beyond their expectation (Appendix A: Table 4.4). The trip made the learning more real and universal. They found the problems of poverty and food insecurity structural, as there is a lack of efforts from government policies to attend to the poor. However, there was optimism in looking for solutions as long the local community is open for change and adoption of advanced practices. The depth of poverty in Haiti allowed the students to review their own reflections, become more realistic about developmental work, and become more aware to never take for granted what they have in their life in the U.S. The EL also deepens the knowledge about what they already knew about poor developing countries.

The Likert analysis evaluated the personal learning experiences which involved EL, with the students. It consisted of eight items, which resulted in a mean of 2.14 (Appendix A: Table 4.6, 4.7). This revealed a high level of personal learning. The Cronbach Alpha for the total items was 0.871 which showed a high level of internal consistency (Appendix A: Table 4.8). The students were somewhat equally divided about whether they found the process of developing ELMs challenging, which depended a lot on their level of preparedness and past experiences. They found significance in connecting the EL to their course content at college, which positively improved their abilities in investigating and providing solutions to problems of food insecurity. They were not culturally shocked with the challenging conditions during the immersive experiences, but the new experiences allowed them to have transformational growth. They experienced absolute poverty, the realities of food insecurity, malnutrition and human sufferings. The role of the host organization was considered very helpful in providing the platform for facilitating the immersive experiences (Appendix A: Table 4.3).

The findings showed that the EL heightened the students' level of knowledge and ability to understand course content (Appendix A: Table 4.5). The students had a lively experience, which could be related to the course content. They found teaching and the field experiences as complementary, which was related to the real-world context. Some students were invited because of their expertise in horticulture to contribute towards the building of ELMs. This service-learning reinforced content knowledge through real-world application. The reflections encompassed the areas of self-development, global mind-set, cultural intelligence, responsible mind-set and community building (Pless et al., 2011).

The Likert questions analyzed the effect of the EL on the meta-cognitive skills through their critical thinking and reflective practices which formed part of the learning processes. The

construct of critical thinking consisted of eight items which resulted in a mean of 1.74 (Appendix A: Table 4.9, 4.10). This revealed a high level of critical thinking. The Cronbach Alpha for the total items was 0.886 which showed a high level of internal consistency (Appendix A: Table 4.11). The students found their field observations vital during this immersive experience. They did not have presuppositions, as such as they preferred to constantly analyze and reflect on their new experiences. They preferred to base their work on what they were experiencing visually and physically, rather than relying on information from other sources, such as internet and research papers. They were engaged in logical reasoning as the framework imposed used to investigate food insecurity, which involved an inductive and deductive cycle. The students were learning through transforming their experiences into knowledge, which is the basic objective of this service learning in Haiti (Appendix A: Table 9).

The construct of reflective practices consisted of seven items which resulted in a mean of 1.6 (Appendix A: Table 4.12, 4.13). This revealed a high level of reflective practices. The Cronbach Alpha for the total items were 0.874 which showed a high level of internal consistency (Appendix A: Table 4.14). The findings revealed a high level of reflexivity among the students as they were acquiring new insights, by constantly reviewing and reflecting on their conclusions and generating new or additional explanations. They were viewing the community differently and the experience they had in Haiti was beyond their imagination. They had lively experiences which allowed them to deconstruct and realign with what is really important for ensuring food security and rural development in Haiti. The students also witnessed the resilience of the local people despite their challenging conditions (Appendix A: Table 12).

The construct of impact and change consisted of eight items which resulted in a mean of 1.7 (Appendix A: Table 4.15, 4.16). This revealed a high level of impact and change that the EL

had on the students. The Cronbach Alpha for the total items was 0.886 which showed a high level of internal consistency (Appendix A: Table 4.17). The students showed an improvement in their ability to carry out community study, relating and applying their course content to real life situations, with an increased sense of responsibility toward the issue of food insecurity They responded with a higher level of confidence in tackling complex issues related to food insecurity and also in making decisions in uncertain situations. The EL allowed them to understand and learn about a different culture, while improving their communication skills. The EL is considered to have a positive overall impact on their learning, with better understanding of intercultural diversity, improved cognitive skills and mind-set (Appendix A: Table 4.15).

The construct of overall improvement consisted of five items which resulted in a mean of 1.5 (Appendix A: Table 4.18, 4.19). This revealed a high level of overall improvement among the students' capabilities. The Cronbach Alpha for the total items were 0.893 which showed a high level of internal consistency (Appendix A: Table 4.20). The results show an overall improvement related to the student's professional life, civic responsibility and self-confidence. The experience in Haiti influenced their professional development and their engagement into community development. They became informed citizens, empowered to carry out community development projects (Appendix A: Table 4.18). The six learning areas (Pless et al., 2011) met consistently during the study were mind-set, ethical literacy, cultural intelligence, global mind-set, self-development and community building.

The Spearman's rho Correlations was conducted to determine the relationship among the dependent variable, overall improvement, the learning processes (which combined the mean of Likert analysis of personal learning experiences, critical thinking and reflective practices), and impact and change. The results showed a moderate association with statistical significance

between overall improvement and learning process (correlation coefficient is 0.636 and p<0.05). There was a very strong association and statistical significance between overall improvement and impact and change (correlation coefficient is 0.908 and p<0.01). There was a moderate association with statistical significance between learning process and impact and change (correlation coefficient is 0.634 and p<0.05) (Appendix A: Table 4.21). The findings from the Spearman's Rho correlations revealed that the learning processes has a significant impact and change on the students meta-cognitive and capabilities, which resulted in an overall improvement.

Conclusion

The pre-trip departure planning proved to be very useful to the students, preparing them to encounter the harsh realities of the Haitian conditions, as they could be unsettled with the extent of poverty. They were looking forward to an international experience in community development and intercultural exchange for a better career prospect. To some extent this task of developing ELMs was not very clear to all the participants, which was, nevertheless, overcome by pairing with a faculty member at the host site in Haiti. There was a very poor competency about the Haitian local language among the participants which was resolved by being accompanied by local translators during their field trips or research work. The Christianville Foundation Inc. provided the appropriate setting for this developmental work.

Students with previous experiences in ISL, proved to be beneficial for their immersive experience as compared to those without it, who found the trip challenging.

The post-trip reflections revealed that this ISL program was a success, with a very good level of knowledge acquisitions. The EL contributed towards their personal and professional growth. They understood the challenges of food insecurity and malnutrition, which were related

mainly to poverty, low agricultural productivity, corruption, and lack of infrastructure and education. They were equally divided on whether they found the process of developing the ELMs challenging. They mentioned the time frame for development of the ELMs as too short. It was interesting to point out that they developed ELMs which were related to their respective field of study. They were not so much culturally shocked during their immersive experiences, but becoming aware of the level of poverty the community was facing allowed for a personal transformation. The students were more creative in encountering new conditions, while dealing with their research. They mentioned that this EL empowered them to face and work in similar poor developing countries.

The findings showed a very high level of critical thinking and reflexivity among the students, which allowed them to engage in logical reasoning. They have to deconstruct and reconstruct their interpretations with the new reality and rethink what is important for solving problems of food insecurity, having an impact on rural development. The powerful learning experiences allowed the reconstruction of the meaning of food insecurity and poverty and be realistic in their approach. While working with the local people their views changed. They found a very resilient community, working hard to sustain a livelihood.

The study revealed that the EL had a very high and positive impact on the students. The EL heightened their ability to carry out community study and apply course content in real situations, using more confidence in solving complex problems and making decisions in situations of uncertainty. The ISL also allowed the development of empathy towards the marginalized groups and for the students to become more civically engaged towards alleviating poverty and food insecurity. The students mentioned that their course content being enhanced by field experiences was vital to adult education. Despite short-term action research as being

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preferred (Hackney, Boggs & Borozan, 2012), this ISL of one week was considered as too short for an immersive experience by the students. Similar ISL programs need to find an appropriate time framework for a better service learning.

The six learning areas developed by (Pless et al., 2011) which were responsible mind-set, ethical literacy, cultural intelligence, global mind-set, self-development and community building were met consistently during the study. An understanding of the local culture helped to design better strategies for solving complex problems of food insecurity. The reality in Gressier was even more pronounced with the level of poverty witnessed.

The EL was intended to augment the learner's conception and understanding of the problems of agricultural development. This would help in better preparing students for careers in international agricultural development, especially in the field of agricultural extension, rural development and food security.

Certain key learning principles must be met for the requirements of an effective international service-learning program (Crabtree, 2008), which in turn improves the EL. Besides the EL benefiting the students with improved meta-cognitive skills and mind-sets, it is important to ponder on the beneficence and reciprocity of such programs. Firstly, how and to what extent did the Haitian community benefit from this community study? The study identified the needs of the local community and provided solutions to the problems of food insecurity. There was also the possibility for career exploration, which describes types of employment opportunities along with the tasks to be carried out in related occupations. This opportunity was opened up to the public at large to participate in their field of expertise and contribute toward alleviating food insecurity. The benefits of short-term ISL are well documented, however, little is known about

long-term impacts on the students and the community, which still require longitudinal research (Kiely &Nielsen, 2003; Kiely, 2005).

From the perspective of community development and collaboration literature, the questions pondered were the following: to what extent did the community study address root causes of social problems and to what extent did the communities participate in project? This study was undertaken within a community participatory research-based approach, based on a social constructivist approach. The framework of the Kolb learning model (Kolb, 1984), which is an inductive and deductive research cycle, guided the students and ensured that the root causes of social problems were addressed. The local community actually contributed by sharing their views and expertise and validated the research findings.

The students developed a close relationship with the local community, which was essential for the progress in the development of the ELMs. The students also developed an attitude of reciprocity, avoiding the "paternalistic paradigm", where the host organizations act as a passive recipient of charity (Baker-Boosamra, Guevara & Balfour, 2006).

The study encompassed a broad range of fields such as water management, sustainable farming practices, composting for recycling nutrients, agricultural projects, agri-business, aquaculture, livestock and animal husbandry, agricultural extension, vocational education, nutritional diet from moringa plant, and post-harvest practices; all geared toward improving food security in the region of Gressier. The potential solutions provided were based on the resources available to the community locally.

From the participatory research methods literature, community participation rested on the student's approach. During the concrete experiences, community leaders and managers from the Christianville Foundation Inc., the people, and the investigators were allowed to express their

views on the researched areas. They made sure the research purpose was aligned with valuable objectives. The active experimentation components allowed the community to validate the solutions proposed. The students adhered to this practice in different ways through meetings with the Haitian community and faculty members. Nevertheless, the initial findings and final outcomes of the ELMs were presented to the officials of the Christianville Foundation Inc. in due course, who gave valuable inputs. EL also occurred along with the participation of the community making the experience more meaningful. This EL allowed the students to carry out community-based research, while developing solutions related to agricultural development.

Crabtree (2008) mentioned the prospect of intercultural understanding in ISL programs. The EL in Haiti allowed cross-cultural adjustments while absorbing the culture shock simultaneously. The smooth preparation started through the explanatory pre-departure meetings. Competency in the foreign local language was considered as an advantage allowing a better immersive experience. Pusch (2004) found a relationship between ISL experiences and a higher level of self-awareness, and cross-cultural with global social injustice (Crabtree, 2008). The experiences in Haiti allowed skills and development, intercultural learning transformation of individual experiences, and social relations. Globalization has impacted the ability of these students to immerse themselves fully in another culture (Perkins et al., 2017; Karakos et al., 2016).

The ISL allowed the students to become informed citizens and to be more civically and socially engaged, and to develop a stronger commitment toward community service in an international context (Kenny & Gallagher, 2002; Parker & Dautoff, 2007). This will help in providing social justice to the marginalized group in Gressier, promoting opportunity, growth, and social well-being.

The theoretical foundations for an ISL by Crabtree, were respected in this study, where it reciprocally improved the EL of the students. A well designed ISL, with a proper pre-trip preparation, and a well-defined and planned agenda are important for a quality EL for abroad programs.

The EL allowed cross-cultural awareness and the discovery of the realities of global social injustices. It was a transformational learning experience that better empowered the students for community development.

The major objective linking EL to ISL projects, education, community-based research, service learning, and community service enhanced the students' global awareness, development of human values, intercultural understanding and communication, civic mindedness, and leadership skills (Berry & Chisholm, 1999; Hartman & Roberts, 2000). Moreover, the benefits of EL encompass better career opportunities, personal growth, and real-life experiences (Le & Raven, 2015).

The intangible benefits of ISL include the power of witnessing (Morton, 1995). This study was conducted with only a sample size of ten participants, which is limited for deducting and drawing conclusions from the results of the correlations. However, this represents an illustrative pilot effort, which serves as showing that ISL enhanced the student's metacognitive skills and abilities. Moreover, further similar studies need to be carried out for improving the validity of this study.

This study serves as a purpose for providing insights and recommendations for similar ISL. Future research should determine the impact of ELMs on international development to understand their contribution to community development.

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Appendix A

Table 4.1 Pre-Trip Reflections -Selected Narratives of Responses from Open Ended Questions

Open Ended Questions	Evidence of Learning	Responses of participants
Were the pre-departure meetings helpful? Please elaborate	Self-development Global mind-set Responsible mind-set	I expected more preparation for the actual ELM development and what was expected of me. I felt confused in regard to this the entire experience. Didn't fully prepared me for the trip, but nothing could have. For someone going out of the country for the first time there is never enough information. Somewhat - if I was new to traveling overseas it would have been more helpful It prepared me for what to expect and what to pack before traveling. They gave me a clearer picture of Haiti and what to expect Yes, they prepared us for the realities of Haiti Yes, they were helpful in understanding the task of developing the ELMs and preparing for what we would encounter. Somewhat helpful, could have been more detailed on what to expect

Open Ended Questions	Evidence of Learning	Responses of participants
What did you hope to gain professionally and personally from the EL trip?	Cultural intelligence Global mind-set Community building Ethical literacy Responsible mind-set	I hoped to gain a new understanding of foreign agriculture and a new appreciation for the people living in third world countries I hoped to re-inspire my love for international travel and work. To learn more about the culture and reality of Haiti, as well as gain experience in working in developing countries. Networking, working with different culture. More diversity to my overseas experience and a view of development work from a non-missionary viewpoint. Ability to adapt to work in different cultures I hoped to see the culture in Haiti and what the need was from the community. I hoped to network and explore career options in international agriculture. Glimpse into another culture, understanding of current development efforts in the area, broader my world view/ perspective, network with other students and professors of similar interest. Community building experience More exposure to the issues facing humanity, regarding good security and agriculture. More exposure to another part of the world where I hadn't been before.

Open Ended Questions	Evidence of Learning	Responses of participants
Why you choose to make this educational trip to Haiti?	Community building	I wanted to travel abroad and learn about agriculture in foreign countries, Interested in international challenges in agriculture
	Self-development	I chose to take the trip to Haiti because I needed to see if I could get over a prior international experience and pursue a career in international development.
	Global mind-set	
	Responsible mind-set	To learn more about livestock production in developing nations. to help with animal focused ELM.
		Research opportunity - I have past experience overseas
		I was invited to go as a student interested in international development it was too good of an opportunity to decline.
		To learn more about extension and communities
		To see the agriculture and other issues there with my own eyes. I was also looking forward to offering my own expertise to the context and potentially assist in solving some issues at the EL site.

Table 4.2 Summary of Nominal Likert Scale Analysis (%) for Pre-Trip Evaluation (N=10)

	Yes (%) / (N)	No (%) / (N)
I was familiar with study abroad programs	(80%) 8	(20%) 2
I was a volunteer in my community before the trip	(80%) 8	(20%) 2
The pre-departure meetings were helpful	(80%) 8	(20%) 2
I have good understanding of the needs and challenges of the community I was about to research	(70%) 7	(30%) 3
I have competency in the foreign language of the host country	(20%) 2	(80%) 8
I have an idea of what I would research upon in Haiti	(50%) 5	(50%) 5
I was more confident in developing ELMs within my field of study	(80%) 8	(20%) 2

Table 4.3 Post-Trip Reflections (Immersive Experience) -Selected Narratives of Responses from Open Ended Questions

Open Ended Questions	Themes/Evidence of Learning (Pless et al., 2011)	Responses of participants
What you think were the central problems of human sufferings linked to food insecurity in Haiti?	Global mind-set	I would say lack of education and poor nutrition are two key concerns.
	Responsible	Corrupt government, dependency on aid organizations, lack of human capital development, lack of motivation to work and improve due to aid dependency.
	mind-set	Poverty, government management, and access to knowledge and resources.
	Self-development	Access education/extension support
	Ethical literacy	Lack of access to advanced agriculture technology (tractors, fertilizer, GMO seed, etc.).
		Resources, input, education, bad governance.
		Lack of infrastructure, lack of markets, lack of ability to access land and the tools and organization needed to produce food from that land. Corruption, I'm sure has a big part in obstructing resource and information dissemination.
		I saw the most extreme poverty conditions that I've ever seen when I was in Haiti on this trip. Development effort are disjointed and disassociated. Multiple agencies start programs and project in the same region, even with the same target communities. Resource waste and subject exhaustion, but I'm not sure what there is to be done about it

Open Ended Questions	Themes/Evidence of Learning	Responses of participants
What were the most satisfying parts of the Haiti experiential activity?	Global mind-set	Interacting with the kids at the school we visited
	Self-development	Learning about the culture, meeting people, seeing different livestock practices.
	Cultural intelligence	Seeing the pride on students on their faces with their finished project.
	Responsible mind-set	Getting to know the Christianville staff, Conversations with the employees
	Community building	Feeling like the communities truly listened to my ideas and would concern trying out new agriculture practices to better their lives, the people are amazing
		Developing the ELM, Great experience visiting the farms and seeing ways they could improve on their activities.
What did you do in the Haiti experiential activity that you think made a difference in Haitian lives?	Global mindset	I hope that I presented a friendly and professional persona, rather than domineering and privileged while working with Haitian agriculturists.
	Self-development	Hopefully built some good memories with children and staff
	Community building	Nothing
	Responsible mind set	Showed them how important animal protein is in their diets, and why is it important to vaccinate and feed high quality diets to the animals they slaughter.
		Improve on the learning tools used by the CVET students.
		Just talking with people and being on their level. But it would be nice to think someone could make use of the recommendations I made for their farms someday also.

Table 4.4 Post-Trip Reflections (Change of perspective) -Selected Narratives of Responses from Open Ended Questions

Open Ended Questions	Themes/Evidence of Learning (Pless et al., 2011)	Responses of participants
How this educational trip changed your perspective on human suffering linked to poverty and malnutrition in Haiti?	Global mind-set	made it more real and universal
	Self-development	I definitely saw some bad things, but I saw many more good things. I saw that there is raw real mess in Haiti, but also still hope.
	Cultural intelligence	It further educated me along the lines of what I already knew
	Responsible mind-set	Realizing the problems are systematic and not the fault of individuals
	Community building	There are ways to help the Haitian communities with malnutrition and food insecurity, but they need to be open to change and adopt advanced practices as well as have access to new technologies.
	Ethical literacy	More needs to be done
		I was aware of the poverty and malnutrition prior to the trip, but there's nothing like seeing it with your own eyes. I also wasn't aware of how many organizations, and how much money, are there to help make positive change, but how they do not interact with each other and so are less effective and efficient than they might be otherwise
In what ways has the Haitian EL changed your views of the world?	Global mind-set	Although I had significant international experience prior to my visit to Haiti, it reminds me of the depth of poverty throughout the world and the ways a lack of leadership makes that more complicated.
	Self-development	It helped me be more realistic about development work.

Cont..	Cultural intelligence	It expanded my understanding of yet another country, Ability to see the people there and not just the poverty
	Responsible mind-set	It makes me very thankful for the life I have in the United States and never to take that for granted.
	Community building	Capitalism is bad, and poverty is really limiting people's potential.

Table 4.5 EL Enhancing Academic Content -Selected Narratives of Responses from Open Ended Questions

Open Ended Questions	Themes/ Evidence of Learning (Pless et al., 2011)	Responses of participants
How was the course content enhanced by the EL in Haiti?	Global mind-set Self-development Cultural intelligence Responsible mind-set Community building	It has made my experience more vibrant and tangible, was able to see concepts taught in classroom in action It is impossible to teach development work without field experience. This Haiti trip gave me the ability to apply my experiences to the course content, which is key to adult learning. It taught me that the things I learned in class really are applied to the real world and how to take that knowledge and put it to good use. I wasn't in a course related to this program. I was invited on this trip because of my expertise in horticulture and experience farming.

Table 4.6 Summary of Mean and Standard Deviations for analysis of Likert scales for Personal Learning Experiences

	Mean	Std Dev
The process of developing ELM was challenging	2.81	0.93
The course content covered at college was enhanced by the EL	2.05	0.86
The EL heightened my ability to connect course content to conditions in developing countries similar to Haiti	2.14	0.96
The EL enhanced my ability to be more creative in finding solutions for food insecurity in similar developing countries to Haiti	1.76	0.54
There was a cultural shock seeing the level of poverty and human suffering	2.86	1.39
The culture shock helped in my personal growth and transformation	2.14	0.91
The EL made me aware of the realities of level of poverty in Haiti	2.00	1.14

Note: 1 = strongly agree, 2 = agree, 3 = neither agree or disagree, 4 = disagree and 5 = strongly disagree. (N=10)

Table 4.7 Summary Item Statistics for analysis of Likert Scales for Personal Learning Experiences

	Mean	Minimum	Maximum	Range	Max Min	Variance	N of Items
Item Means	2.143	1.381	2.857	1.476	2.069	.244	8

Table 4.8 Reliability Statistics, Cronbach Alpha (α) for Likert Scales analysis for Personal Learning Experiences

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.862	.871	8

Table 4.9 Summary of Mean and Standard Deviations for analysis of Likert scales for Critical Thinking

While I was developing the modules…….	Mean	Std Dev
...my observations were vital	1.62	.50
...I was constantly analyzing and reflecting on my experiences	1.76	1.04
...I have to deal with presuppositions and evaluate the existing evidence	1.86	1.01
...I was seeking more information from other sources e.g. internet, research papers, interviews, meetings etc.)	1.76	.77
...I was engaged in logical reasoning	2.33	1.28
...I was transforming my experiences into knowledge	1.57	1.08

Note: 1 = strongly agree, 2 = agree, 3 = neither agree or disagree, 4 = disagree and 5 = strongly disagree. (N=10)

Table 4.10 Table 10: Summary Item Statistics for analysis of Likert Scales for Critical Thinking

	Mean	Minimum	Maximum	Range	Max Min	Variance	N of Items
Item Means	1.738	1.286	2.333	1.048	1.815	.088	8

Table 4.11 Reliability Statistics, Cronbach Alpha (α) for Likert Scales analysis for Critical Thinking

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.873	.886	8

Table 4.12 Summary of Mean and Standard Deviations for analysis of Likert scales for Reflective Practices

	Mean	Std Dev
I was both critiquing current conclusions and generating new hypothesis	1.29	.46
My view of the community I worked with changed	2.10	1.04
The community involvement was an eye-opening experience	1.52	.93
The Haiti experience was a beyond textbook understanding of real life	1.10	.30
The EL made me rethink what is important for food security in Haiti	2.0	.80
EL made me rethink what is important for rural development in Haiti	1.8	.70
Despite the harsh conditions I found the people resilient in Haiti	1.1	.48

Note: 1 = strongly agree, 2 = agree, 3 = neither agree or disagree, 4 = disagree and 5 = strongly disagree. (N=10)

Table 4.13 Summary Item Statistics for analysis of Likert Scales for Reflective Practices

	Mean	Minimum	Maximum	Range	Max/Min	Variance	N of Items
Item Means	1.56	1.10	2.10	1.00	1.91	.16	7

Table 4.14 Reliability Statistics, Cronbach Alpha (α) for Likert Scales analysis for Reflective Practices

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.859	.874	7

Table 4.15 Summary of Mean and Standard Deviations for analysis of Likert scales for Impact and Change

The EL in Haiti……….	Mean	Std Dev
...improved my ability to carry out community study	1.7	.56
...heightened my ability to apply course content to real life	1.6	.49
...increased my sense of responsibility towards alleviating poverty and human sufferings.	1.8	1.04
...made me more confident to make decisions in situation of uncertainty	1.9	1.01
...increased my ability to solve complex problems	1.8	.77
...improved my knowledge through comparing Haiti to own conditions.	2.3	1.27
...improved my communication skills in a culturally diverse environment	1.6	1.07
...allowed me to better understand different cultures	1.3	.46

Note: 1 = strongly agree, 2 = agree, 3 = neither agree or disagree, 4 = disagree and 5 = strongly disagree. (N=10)

Table 4.16 Summary Item Statistics for analysis of Likert Scales for Impact and Change

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	1.738	1.286	2.333	1.048	1.815	.088	8

Table 4.17 Reliability Statistics, Cronbach Alpha (α) for Likert Scales analysis for Impact and Change

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.873	.886	8

Table 4.18 Summary of Mean and Standard Deviations for analysis of Likert scales for Overall Improvement

The experiential learning……	Mean	Std Dev
... enabled me to bridge learned skills and professional life	1.67	.73
...increased my sense of civic responsibility	1.52	.93
...influenced my professional development	1.24	.44
... increased my self confidence	1.52	.51
...empowered my engagement in community development	1.33	.48

Note: 1 = strongly agree, 2 = agree, 3 = neither agree or disagree, 4 = disagree and 5 = strongly disagree. (N=10)

Table 4.19 Summary Item Statistics for analysis of Likert Scales for Overall Improvement

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	1.457	1.238	1.667	.429	1.346	.029	5

Table 4.20 Reliability Statistics, Cronbach Alpha (α) for Likert Scales analysis for Overall Improvement

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.851	.893	5

Table 4.21 Spearman`s rho Correlations of Overall Improvement, Learning Process (Include Personal Learning Experiences, Reflective Practices and Critical Thinking) and Impact and Change from the ISL in Haiti

	1	2	3
1. Overall Improvement	--		
2. Impact and Change	.908**	--	
3. Learning Process (Inc Personal Learning Experiences, Reflective Practices and Critical Thinking)	.636*	.634*	--

*p<0.05; **p<0.01; N= 10

*Correlation is significant at the 0.05 level (1- tailed)
**Correlation is significant at the 0.01 level (1- tailed)

Appendix B

Assessing Developers of ELMs

Hereunder the consent form, which must be signed, if you wish to participate.

(NOTE: DO NOT AGREE TO PARTICIPATE UNLESS AN IRB APPROVAL WITH CURRENT DATES HAS BEEN APPLIED TO THIS DOCUMENT.)
IRB Approved - IRB Protocol #19-075 EP 1904
INFORMATION LETTER
for a Research Study entitled" **Measuring Impacts of ELMs: Assessing Change and Consequences for the Developers of ELMs"."**

You are invited to participate in a research study to measure the impact of the experiential learning modules had on their authors. The study is being conducted by Mr. Abhimanyu Gopaul, under the direction of Dr. Joseph Molnar in the Auburn University Department of Rural Sociology. You were selected as a possible participant since you developed the ELMs and are age 19 or older. What will be involved if you participate? If you decide to participate in this research study, you will be asked to answer an online questionnaire. Your total time commitment will be approximately 15– 20mins. If selected for a face to face interview, it will take approximately 35-40 mins. Are there any risks or discomforts? The risks associated with participating in this study is that the data are non-anonymous. To minimize these risks, data collected will remain confidential. The overall findings will be used for my dissertation. Are there any benefits to yourself or others? If you participate in this study, you can expect to gain professionally and personally on reflecting on your experiences and lessons learned. We/I cannot promise you that you will receive any or all of the benefits described. Will you receive compensation for participating? There will be no compensation for participation. Are there any costs? If you decide to participate, you will not incur any costs. If you change your mind about participating, you can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University, the Department of Rural Sociology. Any data obtained in connection with this study will remain anonymous. Your privacy will be protected. Any information obtained in connection with this study will remain confidential. Information obtained through your participation may be published in a professional journal and presented at a professional meeting. The data, however, will be used for my dissertation. If you have questions about this study, please contact Dr. Molnar at molnajj@auburn.edu or Myself -Abhimanyu Gopaul (Roopesh) at azg0063@auburn.edu. After signing the consent form, you can keep a copy for you. If you have questions about your rights as a research participant, you may contact the Auburn University Office of Research

Compliance or the Institutional Review Board by phone (334)-844-5966 or e-mail at
IRBadmin@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE IF YOU WANT
TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE,
THE DATA YOU PROVIDE WILL SERVE AS YOUR AGREEMENT TO DO SO.

Thank you,
Abhimanyu Gopaul (Principal Investigator)
Date: ……4/30/2019
Investigator obtaining consent
Date: ……4/30/2019
Participant's signature

PLEASE SIGN BELOW

If you wish to participate, click YES

○ Yes (1)

Page Break ———————————————————————————————

Q1
Please complete the survey below
Pre-Trips Evaluation

	Yes	No
I was familiar with study abroad programs (1)	○	○
I was a volunteer in my community before the trip (2)	○	○
The pre-departure meetings were helpful (3)	○	○
I have a good understanding of the needs and challenges of the community I was about to research (4)	○	○
I have competency in the foreign language of the host country (Haiti) (5)	○	○
I have an idea of what I would research upon in Haiti (6)	○	○
I was more confident in developing ELMs within my field of study (7)	○	○

Q2 The Learning Process - Experiential Learning (EL)

	Strongly agree (1)	Somewhat agree (2)	Neither agree nor disagree (3)	Somewhat disagree (4)	Strongly disagree (5)
The process of developing ELM was challenging (1)	○	○	○	○	○
The course content covered at college was enhanced by the EL (2)	○	○	○	○	○
The EL heightened my ability to connect course content to conditions in developing countries similar to Haiti (3)	○	○	○	○	○
The EL enhanced my ability to be more creative in finding solutions for food insecurity in similar developing countries to Haiti (4)	○	○	○	○	○
There was a cultural shock seeing the level of poverty and human suffering (5)	○	○	○	○	○
The culture shock helped in my personal growth and transformation (6)	○	○	○	○	○
The EL made me aware of the realities of level of poverty in Haiti (7)	○	○	○	○	○
The host organization facilitated my immersion in the local environment for EL to occur (8)	○	○	○	○	○

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Q3 Critical Thinking Assessment

While developing the experiential modules....

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
...my observations were vital (1)	○	○	○	○	○
...I was constantly analyzing and reflecting on my experiences (2)	○	○	○	○	○
...I have to deal with presuppositions and evaluate the existing evidence (3)	○	○	○	○	○
...I was seeking more information from other sources e.g. internet, research papers, interviews, meetings etc.) (4)	○	○	○	○	○
...I was engaged in logical reasoning (5)	○	○	○	○	○
...I was transforming my experiences into knowledge (6)	○	○	○	○	○

Q4 Reflective Practices

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
I was both critiquing current conclusions and generating new hypothesis	○	○	○	○	○
My view of the community I worked with changed	○	○	○	○	○
The community involvement was an eye-opening experience	○	○	○	○	○
The Haiti experience was a beyond textbook understanding of real life	○	○	○	○	○
The experiential learning made me rethink what is important for food security in Haiti	○	○	○	○	○
Experiential learning made me rethink what is important for rural development in Haiti	○	○	○	○	○
Despite the harsh conditions I found the people resilient in Haiti	○	○	○	○	○

Q5 Impact and Change - Transforming experience into learning

The Experiential Learning in Haiti....

	Strongly agree (1)	Agree (2)	Neither agree nor disagree (3)	Disagree (4)	Strongly disagree (5)
...improved my ability to carry out community study (1)	○	○	○	○	○
...heightened my ability to apply course content to real life (2)	○	○	○	○	○
...increased my sense of responsibility towards alleviating poverty and human sufferings. (3)	○	○	○	○	○
...made me more confident to make decisions in situation of uncertainty (4)	○	○	○	○	○
...increased my ability to solve complex problems (5)	○	○	○	○	○
...improved my knowledge through comparing Haiti to own conditions. (6)	○	○	○	○	○
...improved my communication skills in a culturally diverse environment (7)	○	○	○	○	○
...allowed me to better understand different cultures (8)	○	○	○	○	○

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Q6 Overall Improvement

The Experiential Learning......

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
... enabled me to bridge learned skills and professional life	○	○	○	○	○
...increased my sense of civic responsibility. (2)	○	○	○	○	○
...influenced my professional development (3)	○	○	○	○	○
... increased my self-confidence (4)	○	○	○	○	○
...empowered my engagement in community development (5)	○	○	○	○	○

Q7 Why you choose to make this educational trip to Haiti?

_____

_____

_____

Q8 What did you hope to gain professionally and personally from this experiential learning trip?

_____

_____

_____

9 Were the pre-departure meetings helpful? Please elaborate

_____

_____

_____

Q10 What did you expect to experience in Haiti?

_____

_____

_____

Your view Please elaborate on the following questions if found relevant to you

Q11 How was the course content enhanced by the experiential learning in Haiti?

_____

_____

_____

_____

Q12 In what ways has the Haitian experiential learning changed your views of the world?

_____

_____

_____

Q13 What you think were the central problems of human sufferings linked to food insecurity in Haiti?

_____

_____

_____

_____

Q14 What were the most difficult parts of the Haiti experiential activity?

_____

_____

_____

Q15 What were the most satisfying parts of the Haiti experiential activity?

_____

Q16 What did you do in the Haiti experiential activity that you think made a difference in Haitian lives?

_____

Q17 How this educational trip changed your perspective on human suffering linked to poverty and malnutrition in Haiti?

_____

General Information

Q18 What year did you begin graduate school?

_____

Q19 What was the name of your Degree Program?

_____

Q20 Date(s) of Trips

☐   May 2016

☐   January 2017

☐   May 2017

Q21 Gender

○ Male

○ Female

Chapter 5: Conclusion

This study investigated ELMs, with educational objectives based on identified needs related to food insecurity and malnutrition, in Gressier, Haiti. The development of the ELMs was conducted under a community participatory based research or community action research approach, using the Kolb's ELT as a framework. The study researched the causes of food insecurity, assessed the impact of the EL on the developers of the ELMs, proposed ways and means to incorporate ELMs in teaching curricula, along with implementation and assessment. It also served in recommending how to improve ISL experiences for similar trips and further research for improving the teaching curricula of ELMs at classroom level.

The main factor considered to be the cause for the food insecure situation in Gressier is poverty, which is interrelated and multidimensional. This phenomenological study on food insecurity addressed these questions (i) How was the phenomenon of food insecurity researched in Gressier? (ii) Why is the region of Gressier food insecure? (iii)   What does it mean to be food insecure to the community of Gressier? (iv) What are the potential solutions for combating food insecurity in Gressier?

This study showed that the political, economic and social distortions contributed towards an absolute poverty which deprived them basic necessities such as health, education, housing and food. The geographic location also contributed to worsening the food insecurity status of the community. This led into a cumulative and cyclical spiral of poverty, continuously affecting the food security in Gressier. The people however, showed resilience, trying their level best to sustain a living. This phenomenological study also allowed to better understand what ELMs are and the processes behind their development. It captured the lively experiences, the multiple realities of poverty and food insecurity, the interaction with a different culture and the struggle and resilience of the local people.

While developing the ELMs, the graduate students during the ISL in Haiti had a short-term total immersion experience. This study showed that the developers of ELMs had a positive experience with powerful learning experiences that allowed a transformational personal growth. Through this experience, they have become better engaged students and more civically responsible.

The ELMs were built with the aim to be incorporated into graduate curricula for teaching international agricultural development. An experiential learning activity was designed, and an instructional model developed for teaching the ELM in a classroom. The ELMs were taught in the Rural Sociology course during Fall 2017 and 2018 in the Rural Sociology Department at Auburn University, where additional curricula were developed and based on them. The ELMs provided a vicarious experience within a classroom setting, with an effective instruction delivery. The study also showed a high level of reflexivity, critical thinking and knowledge acquisition. The objective of preparing students for an international career in agricultural development in poor developing countries was met. The ELMs provided a way to teach agricultural development through an EL while in Haiti, as well as within a classroom setting.

EML has contributed toward developing a new approach for conducting community-based research. There is no guideline as such for community-based research. Community-based education cannot be standardized or centralized, but instead must reflect the unique circumstances encountered within the area of study where one must develop lessons and plans responsive to the circumstances and opportunities that exist beyond their classrooms (Smith and Sobel, 2014). ELMs address a unique circumstance within an area of study and are culturally sensitive where a researcher immerses him/her into the political, social and cultural environment with the aim to solve community needs.

Community based research has long been undertaken by researchers for solving complex problems within a community. ELMs complement such research as it stimulates different ways of thinking and learning. It favored the conjoining of local and expert knowledge through a participatory research.

The ELM has allowed the research on grounded knowledge or situated knowledge that is specific across localities. Being a participatory approach, while 'negotiating the differences' it has been critical for information exchange, sharing of knowledge between locals and experts, where the various stakeholders have different views or possess different types of situated knowledge (Ashwood et al., 2014). They have successfully made the linkage between food insecurity and poverty with agricultural developmental issues and climate change,

Jiggins and Roling (1994) stated that 'in the fields of agriculture and rural development, different types of methodologies have been designed to achieve these main purposes: to provide timely information on physical, social, flows, trends and relationships with respect to specified problems, providing opportunities for local development intervention and to empower communities'.

ELM provided a baseline study, a template for elucidating and depicting complex problems of a community, assessing social problems and allowing the formulation of potential solutions, based on an iterative process of inductive and deductive analysis. Community-based research which considers local and expert knowledge can benefit from ELMs. ELMs allowed a critical learning process, a rethinking process about what is important for the development of the community and a cognitive reasoning beyond the textbook into real life. This allows decisions to be made in situation of uncertainties and improves communication skills needed in a diverse environment. The connection between theory and practice is thus bridged. The case of using ELMs to solve problems of food insecurity and human suffering in Haiti is a good illustration of

how ELMs support community-based research. University students and faculty from the U.S. developed ELMs with humanitarian non-governmental organizations in Haiti. The topic of interest was based on field visits, observations and conversations/meetings/interviews with the local community. ELMs allowed an immersive experience to better understand the context and to come up with innovative ideas and tools to enhance learning, doing and change making across different ways of thinking. The community-based researchers under the development of ELM acted as confrontational actors under conditions of uncertainty and taking complex decisions that cannot wait upon the results of longer-term research or consultation.

The ELM has got a career opportunity section where people from diverse backgrounds can contribute towards the development of the community. Solving complex problems in underdeveloped countries need a multidisciplinary approach. The ELM earmarks the relevance and expertise needed for helping a community. The holistic approach enhances the effectiveness of accomplishing the different challenges faced by the community that can also trigger in depth research for complex social problems.

ELMs are considered tools to support community-based research and are carried out through connecting course content to make it more meaningful. Agricultural students are being asked to be more engaged and to contribute in a meaningful way of civic life to meet the needs of rapidly changing demographic of rural and urban areas. The possibility of a career in a different field of expertise can be envisaged since the subject matter is multidisciplinary.

ELMs provided an innovative means of integrating scientific research knowledge and experiences in the curriculum through an authentic experience in developing countries like Haiti. It allowed graduate students to create solutions to solve complex socio-economic problems related to food insecurity and human sufferings. ELM contributes towards transformative learning with the development of high impact programs where tailor made training was

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developed for the plantain farmers in the Cap-Haitian. It helped with capacity development to empower the people and address complex issues.

ELM has led to the development of sustainable outreach programs and the potential for an extension service and the role of extension was developed for the provision of sustainable farming practices in Gressier region of Haiti for alleviating Hunger and Poverty. A training program on an area wide management control for the fungal disease black sigatoka in plantain was conducted during the period of March 2018 in the region of Cap Haitian, with the collaboration of USAID. It involved all the stakeholders (farmers, extension agents, university students, pesticides dealers and farmers training schools' teachers). The ELMs made a connection among the farmers, the research, and the problems they are facing in the real world.

The ELM also facilitated the development of the proposal of an extension system at the Christianville Foundation Inc. This proposal could be used as a template for mobilizing resources from donor institutions such as USAID in supporting the project. These two cases are the examples of action research where findings were developed into potential projects as well as providing insights into the challenges and constraints the community are facing. The ELM provides a way for carrying out community-based research and have proved to be useful and efficient.

This study has future research needs and are follows: to assess the impact of ELMs on international development and its contribution to community development; to assess EL on similar international service projects to generalize the findings; to evaluate periodically the teaching of ELMs within a curriculum for realigning the tools and enhancing the learning process.

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